BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DIRECT TESTIMONY OF

DANIEL P. MURRAY

ON BEHALF OF
PHILADELPHIA GAS WORKS

Docket No. P-2015-2501500

Revisions To PGW Distribution System Improvement Charge

September 1, 2015

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND CURRENT POSITION WITH PGW.

A. My name is Daniel P. Murray. My position with PGW is Senior Vice President of Customer Affairs and Operations.

Q. PLEASE SUMMARIZE YOUR BACKGROUND AND EXPERIENCE.

A. I received a Bachelor of Science degree in business management from Providence College in 1997. I was appointed the Senior Vice President of Customer Affairs and Operations in December 2012. Prior to this position, I held the following positions at PGW: Vice President Customer Affairs, Director of Resource Management for Field Operations, and Director of Special Projects. Prior to joining PGW in 2006, I was a Senior Manager in the utility practice of Accenture, a global management consulting company.

Q. HAVE YOU EVER PROVIDED TESTIMONY BEFORE THIS COMMISSION?

A. No.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. PGW is petitioning the Commission to increase the 5% cap on the Company's Distribution System Improvement Charge ("DSIC"). The purpose of my testimony is to: (i) explain how PGW plans to accelerate the replacement of "at risk"[1] cast iron and unprotected steel gas main, if PGW's request is granted; and (ii) show how the Company's proposed further acceleration will enhance system safety and reliability, is

[1] I use the term "at risk" to mean PGW's cast iron and unprotected steel mains. Consistent with PGW's Distribution Integrity Management Plan ("DIMP"), PGW determines the priority of removal of at risk main based on the risk ranking of the various categories of main, as set forth in its DIMP.

cost-effective and will ensure and maintain adequate, efficient, safe, reliable and reasonable service and is therefore in the public interest.

II. BACKGROUND

Q. PLEASE PROVIDE A GENERAL DESCRIPTION OF PGW'S GAS DISTRIBUTION SYSTEM.

A. PGW's gas distribution system serves more than 500,000 customers in Southeastern Pennsylvania in the County and City of Philadelphia using approximately 3,000 miles of natural gas mains, 66% of which are at risk, as well as some 3,000 miles of service lines ("services"). PGW's at risk mains are composed of 49% cast iron and 17% unprotected coated steel. The Company's services are made up of 75% plastic and protected coated steel, 20% bare steel and 5% unprotected coated steel.

Q. WHAT IS THE AGE PROFILE OF PGW'S DISTRIBUTION SYSTEM?

A. Like most utilities in the Northeast region of the country, PGW has hundreds of miles of mains that have been under ground for many decades and will require replacement in order to maintain safe and reliable service.

Q. DOES PGW HAVE IN PLACE A PROGRAM TO REPLACE OLDER MAINS?

A. Yes. PGW has had main replacement programs in effect for more than 17 years. Over that time PGW has replaced and/or removed approximately 300 miles of cast iron and 156,000 steel services with plastic and protected coated steel. Currently, as a part of its standard operations within base rates, PGW is removing small diameter cast iron main of all sizes at a rate of about 18 miles per year. In addition, as part of its current LTIIP and

DSIC, PGW is replacing additional cast iron main at a rate of about 7 miles of cast iron main per year.[2]

Q. HOW DOES PGW IDENTIFY MAINS THAT SHOULD BE REPLACED?

A. PGW employs traditional risk management analysis programs, benchmarking analyses/studies and the Company's Main Replacement Prioritization model. Also, PGW's replacement program is informed by its experience from recent incidents at PGW and other natural gas distribution companies ("NGDCs"). The tools that the Company used to formulate its LTIIP include PGW's Distribution Integrity Management Program ("DIMP"), the Advantica Benchmarking Analysis, Risk Analysis and Model, Replacement Analysis and Computerized Main Prioritization and Ranking Program.

Q. PLEASE DESCRIBE PGW'S CURRENT LTIIP.

A. PGW's LTIIP was approved on April 4, 2013.[3] PGW's Commission-approved LTIIP describes the process of evaluating, improving, repairing and replacing its distribution related facilities and equipment, the plan to continue accelerated investments under this process, and the categories and estimated cost of DSIC-eligible property that PGW expects to install over a five-year period (2013 to 2017). PGW's LTIIP proposed that it would advance the replacement of high risk, cast iron main by adding to its existing "18 mile" program.

PGW has identified the following property in its LTIIP for replacement: (i) 12 inch and smaller high pressure main (High Pressure [HP] or 10-35 psig); (ii) 30 inch high

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2 Fluctuations in annual mileage will occur because the average cost per mile can vary based upon numerous factors, such as the size of the pipeline being replaced, the cost of construction and inflation.

3 *Petition of Philadelphia Gas Works for Approval of its Long-Term Infrastructure Improvement Plan*, PUC Docket No. P-2012-2337737, Opinion and Order entered on April 4, 2013.

pressure main (HP or 10-35 psig); and (iii) 8 inch and smaller low to intermediate pressure main (LP/IP or 4.5 inches WC to 5 psig).

Q. HOW WAS THE CURRENT PACE OF ACCELERATED REPLACEMENT ESTABLISHED?

A. The scope and pace of the accelerated main replacement program was determined by the amount of funds available to PGW from its 18 mile program funded in base rates and its approved LTIIP and DSIC. The current maximum allowable DSIC percentage (5%) places a limitation (or cap) on the amount of accelerated replacement of Phase I cast iron mains that can be funded through the DSIC mechanism.

III. ACCELERATED REPLACEMENT

Q. HAS THERE BEEN ANY SUGGESTION THAT PGW SHOULD DO MORE TO INCREASE THE RATE OF REPLACEMENT?

A. Yes. While PGW's accelerated efforts made possible by the implementation of its DSIC have been widely acknowledged to be a positive step in improving the safety and reliability of its distribution system, a growing consensus has developed that more should be done, if possible. Calls for further acceleration have come both at the national and the local level.[4] Most notably, the PA PUC Staff issued a Report recommending that PGW find ways to further accelerate the replacement of at risk mains.[5]

Q. PLEASE EXPLAIN PGW'S REACTION TO THESE RECOMMENDATIONS.

A. In light of these various recommendations, PGW has determined to attempt to accelerate its replacement of at risk mains beyond that permitted by its existing DSIC. In order to accomplish this, PGW is requesting an increase in the current DSIC limitation (or cap) of

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[4] A summary of some of those recommendations appears at paragraphs 16-19 of PGW's Petition that is being filed with my testimony.

[5] *Staff Report: Inquiry into Philadelphia Gas Works' Pipeline Replacement Program,* dated April 21, 2015.

5% of billed distribution revenues to 7.5%, exclusive of reconciliation, for service rendered on or after January 1, 2016. In addition, PGW has determined to pursue another recommendation of the PUC Staff and request the ability to submit a "levelized" annual DSIC.

Q. CAN YOU EXPLAIN THE JUSTIFICATION FOR FURTHER ACCELERATING THE RATE OF REPLACEMENT ?

A. There are a number of factors that justify further acceleration of replacement of at risk mains for PGW, several of which were mentioned in the PUC Staff Report. Most notably, the percentage of cast iron and unprotected steel mains in PGW's distribution system remains among the highest of any NGDC. PGW's high percentage of at risk mains is due to many factors, including the overall age of the system, the logistic difficulty of main replacement in a highly urban environment and reducing the risks associated with gas leaks by configuring its distribution system as almost entirely low pressure (under one pound of pressure per square inch). Nonetheless, in the last several years, an industry and regulatory consensus has developed that replacing at risk mains should be accomplished as quickly as reasonably possible, and PGW fully supports this view.

Q. ARE THERE ADDITIONAL, PGW SPECIFIC FACTORS THAT SUPPORT THIS VIEW?

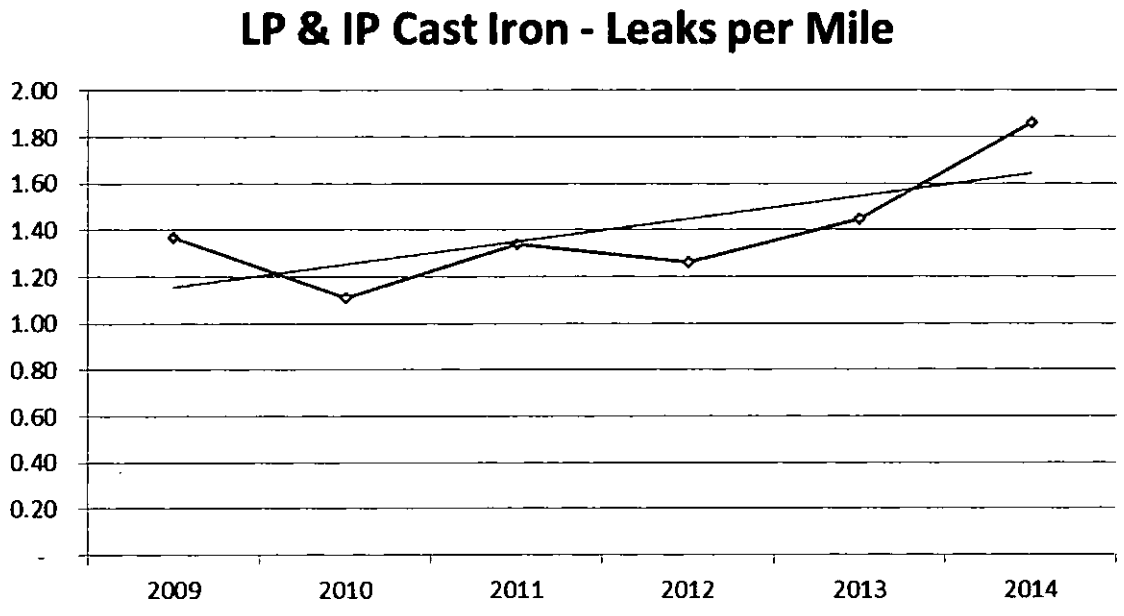
A. Yes. Another factor supporting acceleration is the upward trend in leaks on PGW's distribution system.

Q. PLEASE EXPLAIN THE UPWARD TREND IN LEAKS.

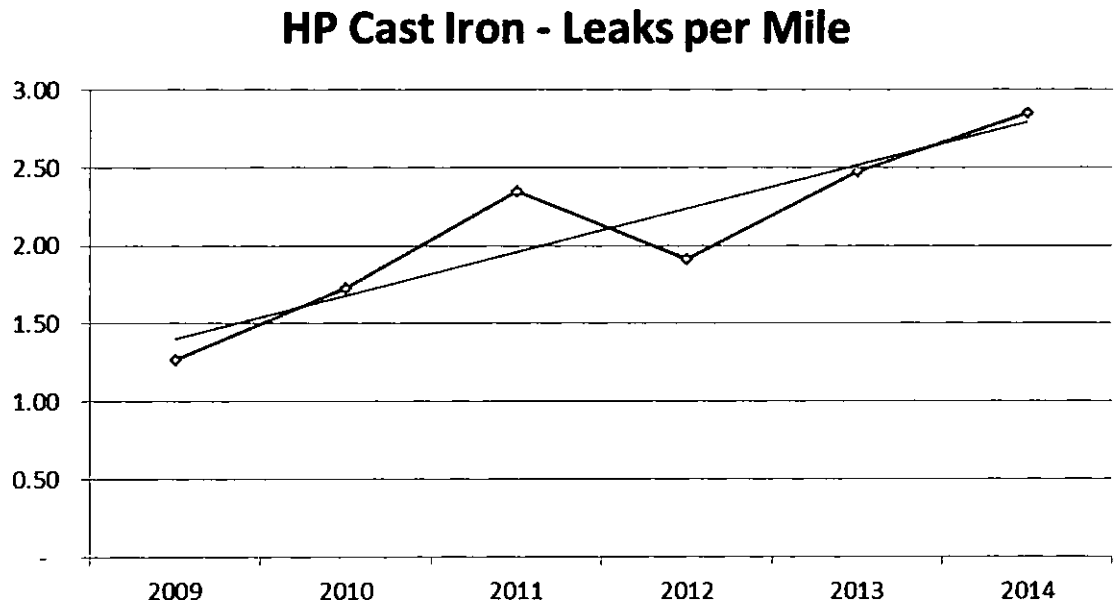
A. Even with its base rate and the current, DSIC funded accelerated replacement programs, PGW has experienced an increase in the number of leaks requiring repair resulting from

natural forces or corrosion on its cast iron and unprotected coated steel mains. Cast iron mains of all diameters and pressures have seen the most significant increase in leaks.

LP / IP - Cast Iron Total						
Leaks Repaired						
Main Material	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Cast Iron	2,032	1,622	1,934	1,801	2,040	2,582



HP - Cast Iron Total						
Leaks Repaired						
Main Material	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Cast Iron	125	171	228	185	225	244

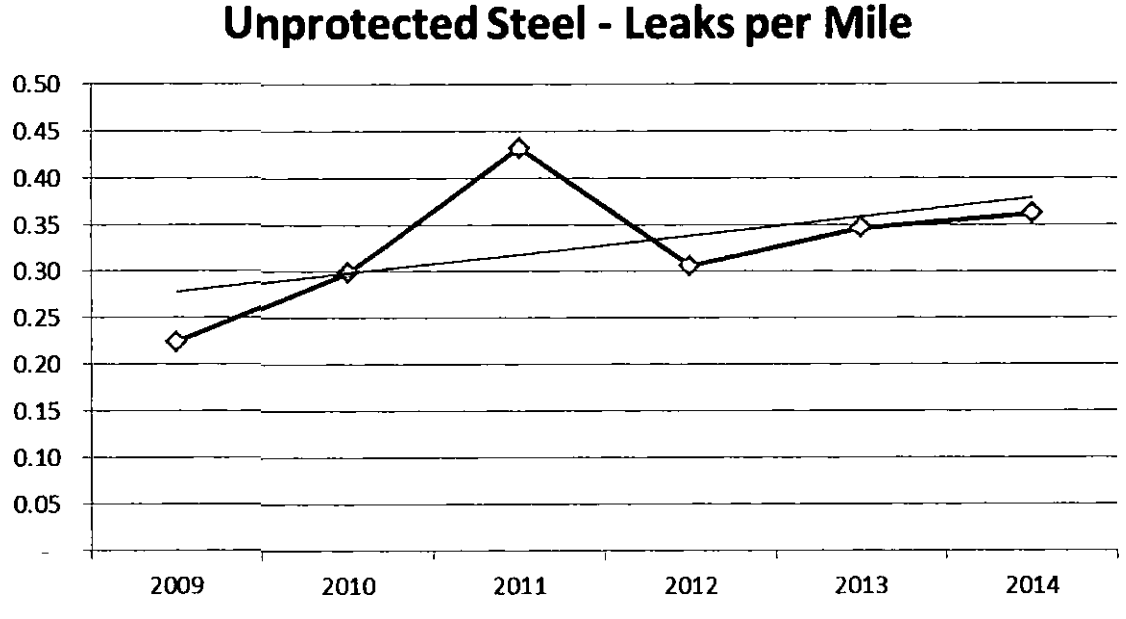


The figures for cast iron main in total are as follows:

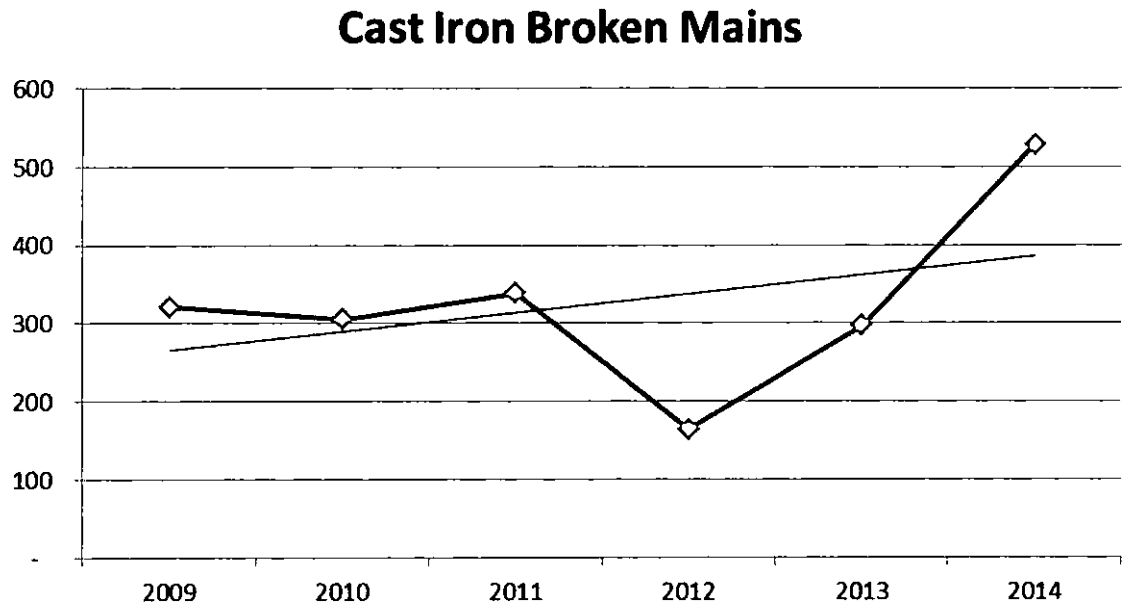
Cast/Iron Total						
Leaks Repaired						
Main Material	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Cast/Iron Total	2157	1793	2162	1986	2265	2826

Though not as significant, PGW is also experiencing an increase in the leaks requiring repair on its unprotected coated steel mains mainly due to corrosion.

STEEL - Total						
Leaks Repaired						
Main Material	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Unprotected, Coated Steel	112	149	215	152	171	178



PGW has also experienced an increase in the number of broken cast iron mains.

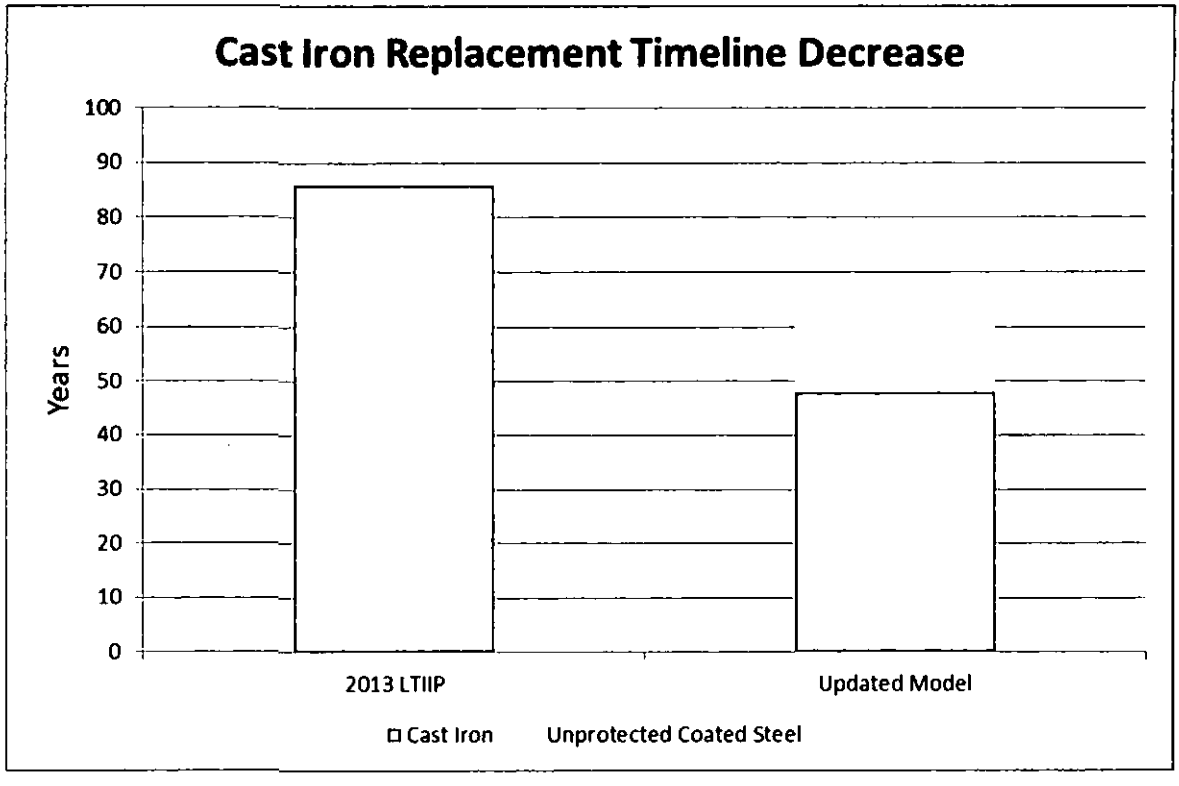


PGW believes that the increased incidence of leaks and breaks is reflective of two primary factors: severe weather that lead to significant depth and fluctuations in frost levels underground in the Philadelphia region, and the increasing age of a majority of its distribution facilities. Importantly, and as the Commission is aware, PGW provides service in an urban environment with high population density and a vast amount of paved ground cover, which can lead to gas leaks migrating to buildings. This means that urban NGDCs like PGW have a greater need to try to take steps to reduce gas leaks. Removing high risk mains more quickly and replacing them with materials that are less susceptible to leaks and breaks would appear to be the best way to reduce such risks.

These factors, some of which were referenced in the PUC Staff Report, have led PGW to the conclusion that increasing the pace of replacement of at risk mains beyond PGW's current plan would be the best way to improve its leak and broken main experience over time.

Q. WOULD PGW'S PROPOSALS INCREASE THE RATE OF REPLACEMENT?

A. Yes. PGW intends to further accelerate replacements if additional funds are available under the DSIC. Such funds would be dedicated, as the current DSIC funds are dedicated, to accelerated distribution facility replacement. If PGW's proposals are approved, PGW expects that the timeline to replace all the cast iron main in the system would decrease from its current projection of 86 years to 48 years.[6] This represents a 44% decrease in the timeline to replace cast iron main compared to PGW's current 86 year projection, based on its projection in its LTIIP.



Q. IS THE PROPERTY PROPOSED TO BE REPLACED ELIGIBLE PROPERTY UNDER ACT 11?

[6] The timeline for replacing all cast iron and unprotected steel would be 65 years.

A. Yes. The property proposed to be replaced, as described above, is generally characterized as piping, couplings and valves and are DSIC-eligible under Section 1351 of Act 11.[7] Importantly, when and if the PUC approves PGW's request to increase its DSIC financed main replacement to 7.5%, PGW will file an amendment to its current LTIIP seeking Commission approval of its specific plan for use of these additional funds. That amendment will, of course, be subject to PUC review and approval. PGW will employ its DIMP to identify the order of main replacement, focusing initially on main that rank as "high risk" in its DIMP, and then moving to lower risk facilities.

Q. HOW MUCH MORE WOULD PGW BE ABLE TO SPEND IF THE DSIC CAP WERE INCREASED TO 7.5%?

A. For calendar year 2016, PGW projects that a 7.5% cap would permit it to expend $11 million over and above what the Company spends for its current DSIC financed and base rate replacement programs. I would also note that PGW plans to continue to fund the accelerated main replacement program through the DSIC on a pay-as-you-go basis; any limitation on DSIC recovery for these expenditures will result in a corresponding reduction of the scope of the accelerated main replacement program.

Q. HOW WILL THESE ADDITIONAL COSTS BE RECOVERED?

A. As Mr. Dybalski explains in his testimony, these additional expenditures will be recovered through the Company's DSIC tariff.

Q. IN YOUR OPINION, WOULD THE PROPOSED ACCELERATION HELP PGW TO ENSURE AND MAINTAIN ADEQUATE, EFFICIENT, SAFE, RELIABLE AND REASONABLE SERVICE ?

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[7] 66 Pa. C.S. § 1351. PGW also plans to replace other DSIC-eligible property including the unprotected bare and unprotected coated steel services and meter sets associated with the removed cast iron mains, and the related eligible property includes gas service lines, fittings, risers, meter bars and meters with attached automatic meter reading devices.

A. Yes, further acceleration will contribute to:

a) Reducing leaks and the concomitant risk of serious incidents from those leaks, compared to what PGW is likely to experience without acceleration;

b) Reducing breakage repairs and future breakage repair costs, again, compared to the costs it would incur absent acceleration;

c) Reducing leak maintenance and repair on the facilities being removed from service; and

d) Reducing leaks will result in levels of unaccounted-for gas (again, compared to the amounts PGW would experience absent acceleration).

By replacing its highest risk pipe, PGW expects to decrease the number of leaks requiring repair on the system, and as a result provide safer and more reliable service to its customers. Reducing the number of leaks will reduce the time and money that PGW would otherwise have to expend to repair those leaks compared to what PGW would have to expend if it did not accelerate its main replacement program. In addition, it should be noted that natural forces is the highest ranking threat in PGW's DIMP. As a result, the quantity of both leaks and main breaks will be impacted by instances of severe weather and frost levels. However, as the riskiest main are replaced the long term trends for both leaks and main breaks are expected to demonstrate a decrease. Therefore, while I am not asserting that the total amount PGW must expend on leak repair will necessarily go down in absolute terms, over time the cost imposed on ratepayers should be lower than it otherwise would have been absent the accelerated replacement.

Simply put, using the DSIC to raise additional revenue for pipeline replacement will help PGW ensure and maintain adequate, efficient, safe, reliable and reasonable

service. The purpose of the DSIC is to pay for infrastructure improvement and replacement of aging infrastructure. The revenue generated by the DSIC is restricted, by its nature, to eligible infrastructure projects. The DSIC will be a dollar-for-dollar recovery of prudent expenses incurred for improving reliability to customers. PGW's "pay-as-you-go" method is the least costly to customers, compared to the issuance of long term bonds. That being said, PGW's approved LTIIP contains a number of measures to ensure that it is implemented in a cost-effective manner, including utilizing a competitive bidding process for all relevant aspects of the program.

Q. DOES PGW HAVE ADDITIONAL INTERNAL PROCESSES IN PLACE TO ENSURE THAT ITS MAIN REPLACEMENT PROGRAM WILL HELP IT TO MAINTAIN SAFE AND RELIABLE SERVICE?

A. Yes. PGW also relies on its DIMP as a comprehensive process that requires PGW to undertake an assessment of its entire distribution system. PGW's DIMP identifies, evaluates and prioritizes threats to the distribution system and helps the Company identify the most appropriate measures to address any identified risks. As noted, if its petition to increase the DSIC cap is granted the Company will file a modified LTIIP showing the proposed revised schedule of main replacement and the specific types of facilities that will be replaced. Those revisions will be made in accordance with PGW's current DIMP.

Q. WOULD THE PROPOSED FURTHER ACCELERATION BE IN THE PUBLIC INTEREST?

A. Yes. As noted, PGW's proposals would continue the Company's efforts to improve the safety and reliability of its infrastructure. Replacing cast iron pipe contributes to a safer, more reliable, and more efficient natural gas distribution system. PGW's approved LTIIP and DIMP prioritize replacement based on risk. Accelerating this replacement will result

in safer infrastructure in a shorter time frame, by decreasing leaks and main breaks as a result of natural forces which could lead to serious incidents, breakage repairs and future breakage repair costs. These results are in the public interest.

Q. WOULD THE PROPOSED FURTHER ACCELERATION BE COST EFFECTIVE ?

A. Yes. The property proposed would be replaced under PGW's approved LTIIP, as revised. The Company has taken a number of steps to ensure that the LTIIP is implemented in a cost-effective manner. First, the program will be funded on a pay-as-you-go basis to avoid the issuance of long term debt and the negative consequences that would follow from such a course. This "pay-as-you-go" approach reduces costs for customers and prevents adverse effects to PGW's cash flow, debt to total capitalization ratio and bond ratings. Second, PGW will continue to employ its Main Prioritization Model used in its DIMP to identify the priority of replacement that should be utilized. Replacing higher risk main should reduce future breakage repair costs because the accelerated replacement program will reduce breakage repairs in comparison to what PGW would experience if it did not accelerate its replacement. In addition, the Company will use a competitive bidding process that seeks to add new contractors for planning, procurement and construction to create a larger bidding pool and more competitive bid prices.

Q. DOES PGW HAVE PRESENT PLANS TO INCREASE THE DSIC CAP ABOVE 7.5%

A. PGW will continue to review its DSIC-financed main replacement program from year to year to determine whether it would be prudent to request additional increases in its DSIC spending. PGW has elected to begin with an increase of 2.5% in excess of the initial cap in order to gain experience with an expedited program. PGW has not previously engaged

in this level of annual construction and, before moving to even more aggressive levels, it needs to be able to assess a number of factors, including the effect on commerce, traffic congestion, and noise, especially in the more congested areas of the City, and the availability of qualified contractors to perform the work. Once it gains this data it will consider whether it would be prudent to accelerate the pace of its main replacement even further.

Q. DOES PGW HAVE A WORKFORCE MANAGEMENT PLAN TO ENSURE THAT THE PROPOSED IMPROVEMENTS AND REPLACEMENT WORK IS PERFORMED IN A COST-EFFECTIVE, SAFE AND RELIABLE MANNER?

A. Yes. As part of its baseline main replacement plan, PGW currently has departmental structures and qualified staff in place for the prioritization, design, contracting, execution and cost control of main replacement projects. The Planning Section is responsible for prioritization of main replacement projects, design and permitting, cost estimates and bid package preparation. The Supply Chain Department administers the procurement functions such as contractor solicitation, bidding and contract management. Third party contractors are qualified by PGW's Supply Chain Department on the basis of financial fitness, safety performance, minority participation and training records. The Construction Section is in charge of the execution of these contracts. This group manages the project, schedules, monitors and evaluates the overall program and the associated costs. Contractors excavate, install, test and backfill new mains under the direct supervision of a qualified PGW construction inspector, who is required to confirm that the work meets all safety, performance and contractual standards.

Q. DOES PGW HAVE TRAINING PROGRAMS IN PLACE TO ENSURE THAT WORK IS PERFORMED IN A SAFE AND EFFICIENT MANNER?

A. Yes. PGW has a dedicated Training Section that provides classroom, simulated and field training and testing for its personnel to ensure that employees meet standards established by the United States Department of Transportation ("USDOT") and the gas safety regulations and orders of the Commission. The Company has in place a Natural Gas Pipeline System Operator Qualification Plan ("Plan") to train and qualify employees in the USDOT's Pipeline Safety Regulations at 49 CFR 192 Subpart N. This Plan ensures safe and efficient natural gas service by establishing objective criteria related to required qualifications for all persons performing safety-sensitive operations and maintenance tasks on PGW's system. The Plan ensures that employees are able to perform assigned tasks, recognize and respond appropriately to abnormal operating conditions, and maintain necessary records to administer the plan.

III. CONCLUSION

Q. Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

VERIFICATION

I, Daniel P. Murray, hereby state that: (1) I am the Senior Vice President of Customer Affairs and Operations for Philadelphia Gas Works; (2) the facts above set forth in the foregoing document are true and correct (or are true and correct to the best of my knowledge, information and belief); and (3) that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

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Daniel P. Murray

PGW St. 1-R

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

REBUTTAL TESTIMONY OF

DANIEL P. MURRAY

ON BEHALF OF
PHILADELPHIA GAS WORKS

Docket No. P-2015-2501500

Revisions To PGW Distribution System Improvement Charge

October 29, 2015

I. INTRODUCTION

Q. ARE YOU THE SAME DANIEL P. MURRAY WHO PREFILED DIRECT TESTIMONY ON BEHALF OF PHILADELPHIA GAS WORKS (PGW OR COMPANY) IN THIS PROCEEDING?

A. Yes. My direct testimony presented PGW's plans to accelerate the replacement of "at risk"[1] cast iron gas main, if PGW's request is granted. I also explained how PGW's proposed further acceleration is in the public interest and will enhance system safety and reliability, is cost-effective and will ensure and maintain adequate, efficient, safe, reliable and reasonable service.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. My rebuttal testimony responds to the prefiled direct testimony of the following witnesses, who prefiled direct testimony on October 19, 2015:

- Bureau of Investigation and Enforcement (I&E) witnesses: Rachel Maurer (I&E Statement No. 1), Terri C. Cooper Smith (I&E Statement No. 2) and Robert Horensky (I&E Statement No. 3); and
- Office of Consumer Advocate (OCA) witness, Ashley E. Everette (OCA Statement No. 1).

Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.

A. I will address the issues raised regarding PGW's accelerated replacement program, Distribution Integrity Management Plan (DIMP), Long-Term Infrastructure Improvement Plan (LTIIP), and Operator Qualification (OQ) program.

Specifically, I show that, contrary to the OCA testimony, there is more than ample justification to conclude that accelerating PGW's main replacement program will

[1] I use the term "at risk" to mean PGW's cast iron and unprotected steel mains. Consistent with PGW's Distribution Integrity Management Plan ("DIMP"), PGW determines the priority of removal of at risk main based on the risk ranking of the various categories of main, as set forth in its DIMP.

enhance the safety, reliability and efficiency of its distribution network, a conclusion that is consistent with the overwhelming weight of opinion. Moreover, PGW's proposed plan for presenting and obtaining approval of its revised LTIIP will result in PGW not expending the incremental revenues proposed by the Distribution System Improvement Charge (DSIC) percentage increase until PGW has: (1) revised its DIMP in accordance with discussions with the Pennsylvania Public Utility Commission's (Commission or PUC) Gas Safety Division (GSD); (2) reflected those revisions to its DIMP in its proposed revised LTIIP to be submitted to the PUC for approval; (3) provided information in the revised LTIIP to show that it will have adequately trained personnel and programs to handle the additional accelerated program; and (4) received approval from the PUC for its revised LTIIP.

I will also explain why the existing plans and reporting that PGW is required to submit, documenting workforce management and training program and other subjects in accordance with the annual LTIIP review process, are sufficient. As a result, there is no need for new, additional reports, either on an annual or quarterly basis.

PGW should also not be required to perform accelerated main replacements at a level above the current DSIC limitation in order to justify that the DSIC percentage cap can be increased. After a reasonable ramp up period, PGW is confident that, barring unforeseen circumstances, it will be able to meet its accelerated levels of work as defined in its revised LTIIP. In any event, all funds collected via DSIC that are not expended on main replacement will be refunded with interest so there is no risk to ratepayers.

II. ACCELERATED REPLACEMENT

Q. WHAT ARE THE POSITIONS OF THE OTHER-PARTY WITNESSES WITH RESPECT TO ACCELERATING REPLACEMENT OF CAST IRON AND UNPROTECTED STEEL MAINS?

A. The PUC Staff Report[2] recognized the need for PGW to accelerate its main replacement program in order to improve the safety and reliability of its distribution system. With the exception of OCA, the other parties either explicitly support or do not oppose the accelerated replacement of cast-iron and unprotected steel mains by PGW. I&E Statement No. 1, at 3-4; Environmental Defense Fund Statement No. 1; OSBA Statement No. 1, at 3.

Q. PLEASE DESCRIBE OCA'S POSITION.

A. OCA's testimony appears to suggest that there is no substantiated link between accelerated main replacement and a reduction in main breaks and incidents and implies at least, that, accordingly, PGW should not be undertaking an accelerated main replacement program. OCA Statement No. 1, at 3, 5- 6. That suggestion contradicts the overwhelming weight of opinion on the need to remove at risk main from service as quickly as feasibly possible. For example, the PUC Staff Report, which characterized PGW's inventory of cast iron distribution main as requiring accelerated replacement and recommended that PGW find ways to further accelerate the replacement of those mains.[3] In fact, in the Staff Report, PUC Staff concluded that PGW's current "replacement rate

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2 *Staff Report: Inquiry into Philadelphia Gas Works' Pipeline Replacement Program,* dated April 21, 2015.

3 See also, Staff Report at 3 ("Approximately 66 percent of [PGW's] system is comprised of cast iron and unprotected steel, both of which are high-risk pipe that pose a potential threat to life and property in PGW's service territory"); *Id.* at 59 ("PGW's cast iron and unprotected steel pipe are a threat to life and property."); *Id.* at 15 ("PGW's cast iron and unprotected steel pipe "poses significant safety concerns, because given the nature of PGW's urban service territory, gas is more likely to migrate to a building and cause harm to life or property.").

[*i.e.*, prior to PGW's current filing] is not aggressive enough, given the risk that this pipe poses to PGW's system and its customers." Staff Report, at 4.[4]

OCA's position is further contradicted by the industry consensus that recognizes the need to advance the replacement of aging piping and other facilities in order to enhance the safety and reliability of gas distribution systems. For example, in 2011, the United States Department of Transportation[5] and the Pipeline and Hazardous Materials Safety Administration ("PHMSA") issued a Call to Action to accelerate the repair, rehabilitation, and replacement of the highest-risk pipeline infrastructure.[6] The United States Department of Energy also has issued a recent report encouraging the modernization of natural gas infrastructure.[7] These (and other) reports have all concluded that replacing aging cast iron pipe is critical to a cleaner economy and a safer, more efficient natural gas distribution system.[8]

The appropriate conclusion from my observation in my direct testimony that, so far, PGW has not experienced a reduction in leaks or breaks compared to its "pre-DSIC"

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4 *See also Natural Gas Pipeline Replacement and Performance Plans*, PUC Docket No. M-2011-2271982, Tentative Order entered November 10, 2011 and Final Order entered February 28, 2013 (wherein the Commission recommended that NGDC's prioritize the replacement of high-risk pipe, as determined through each NGDC's respective DIMP plan).

5 *The State of the National Pipeline Infrastructure*, US Department of Transportation, (2011), http://opsweb.phmsa.dot.gov/pipelineforum/docs/Secretarys%20Infrastructure%20Report_Revised%20per%20PHC_103111.pdf.

6 Pipeline Replacement Updates: "Background" and "Cast and Wrought Iron Inventory", Pipeline and Hazardous Materials Safety Administration, (April 17, 2014), http://opsweb.phmsa.dot.gov/pipeline_replacement/

7 *Factsheet: An Initiative to Help Modernize Natural Gas Transmission and Distribution Infrastructure*, US Department of Energy, (July 29, 2014), http://energy.gov/articles/factsheet-initiative-help-modernize-natural-gas-transmission-and-distribution.

8 *See, e.g., American Pays for Gas Leaks: Natural Gas Pipeline Leaks Cost Consumers Billions*, Report for US Senator Edward J. Markey [of Massachusetts], (released August 1, 2013), http://www.markey.senate.gov/documents/markey_lost_gas_report.pdf.

experience, is that more acceleration is needed – not that these efforts should be abandoned as not (yet) effective. Accordingly, the Commission should reject the position of the OCA witness that accelerated cast iron main replacement has not been shown to enhance the safety, reliability and efficiency of PGW's distribution system.

III. DIMP AND LTIIP

Q. WHAT IS I&E'S POSITION ON PGW'S DIMP AND LTIIP?

A. I&E has taken the position that PGW must submit a revised DIMP that supports a revised LTIIP before any incremental DSIC monies are spent by PGW. I&E Statement No. 1 at 4, at 3-4, 7-8; I&E Statement No. 2, at 8.

Q. HOW DO YOU RESPOND?

A. PGW believes that the plan it set forth in its Petition to revise its LTIIP after the PUC authorizes an increase in its DSIC is consistent with the position of I&E. PGW is in the process of having a prioritization/benchmark study completed by DNV GL. It is expected that this study will be completed in or before December 2015. That study will, in part, form the basis of revisions to PGW's DIMP. PGW's revised DIMP will be available for inspection by the Commission's GSD in December, and PGW will schedule a meeting with GSD to review the revisions to its DIMP and seek a consensus that PGW's DIMP satisfies the requirements of the Pipeline Hazardous Materials Safety Administration (PHMSA) Part 192 regulations.

Once the PUC has approved PGW's Petition, which should be after GSD has reviewed PGW's revised DIMP, PGW will file a revised LTIIP for Commission approval. That filing will clearly identify how PGW proposes to expend the additional dollars made available by an increase in the DSIC percentage from 5% to 7.5% and will

be consistent with PGW's DIMP. Since the revised LTIIP will increase the total estimated cost of the LTIIP by more than 20% (i.e., will satisfy the definition of a major modification)[9], interested parties will have notice and an opportunity to be heard. See 52 Pa. Code § 121.5. It is expected that Commission review of the revised LTIIP can be completed within 90 to 120 days. See 52 Pa. Code § § 121.5(c).

It is fully expected that each step in this plan of action can be completed before PGW spends any incremental DSIC monies. Simply put, PGW will not be in a position to expend the full amount of its current level of DSIC revenue ($22.5) million before the end of May 2016, given seasonal construction limitations. That being said, given seasonal usage variations, PGW needs to be in the position to collect the incremental DSIC monies starting in January 2016. If the Commission were to for some reason not approve PGW's LTIIP the incremental dollars collected will be refunded to customers. Those refunds, if any, will be made with interest, since, as explained by Kenneth S. Dybalski (PGW Statement No. 2-R), PGW has elected to withdraw its request that the Commission waive the requirement to pay interest on overcollections. Moreover, as proposed in my direct testimony, PGW will provide quarterly filings (on the calendar quarters) showing projected recoverable costs for the year plus any under or over collection amounts. Thus, we believe the proposed procedure set forth in PGW's Petition and reiterated and expanded upon here, fully meets I&E's concerns. It is important to point out, however, that PGW should be permitted to begin billing at the 7.5% level as early in January as possible. As Mr. Dybalski explains, because of the seasonal nature of PGW's revenue collection, delaying billing would mean that it would not be possible to

[9] 52 Pa. Code § 121.2.

bill the full $33 million in 2015. This would create a large under collection to be collected from ratepayers that PGW would have to try to collect in the next year.

Q. ARE I&E (I&E STATEMENT NO. 2 AT 2-3, 8) AND OCA (STATEMENT NO. 1, AT 2, 6, 20) CORRECT IN STATING THAT PGW IS REQUESTING PERMISSION TO FILE THE REVISED/AMENDED LTIIP ON ONE DAY'S NOTICE?

A. No. PGW is seeking permission to file the tariff supplement codifying the requested changes in the DSIC on one day's notice for service rendered on or after January 1, 2016. PGW is not seeking permission to file the revised LTIIP on one day's notice. PGW's Petition proposed that the revised LTIIP be handled in the ordinary course pursuant to the Commission's Regulations, once the PUC approves the increase in the DSIC percentage cap. See 52 Pa. Code §§ 121.2 (definitions), 121.5 (modifications to LTIIP).

Q. WILL THE PLAN OF ACTION YOU DESCRIBE SATISFY I&E CONCERNS, AS STATED IN I&E STATEMENT NO. 2, AT 4-6, REGARDING DIMP COMPLIANCE?

A. Yes. As noted above, PGW believes that its revised DIMP and revised LTIIP will be in place before any incremental DSIC monies are spent by PGW.

Q. WILL THAT PLAN OF ACTION ALSO SATISFY OCA'S CONCERNS REGARDING THE NEED FOR AN UPDATED BENCHMARK STUDY AND REVISED LTIIP? (OCA STATEMENT NO. 1, AT 3, 5-6, 8-9, 19-20)

A. Yes. The revised LTIIP will explain the mains being targeted for replacement and will include data from the prioritization/benchmark study.

V. OQ PROGRAM

Q. WHAT IS I&E'S POSITION ON PGW'S OQ PROGRAM?

A. I&E's position is that PGW needs to demonstrate to the Commission that PGW has taken measures to have a trained workforce to perform main replacement at the proposed

increase level before PGW expends the accelerated main replacement activities. I&E Statement No. 3, at 2, 3-6.

Q. HOW DO YOU RESPOND?

A. As I explained in my direct testimony, PGW has: (1) an existing workforce management plan to ensure that the proposed improvements and replacement work is performed in a cost-effective, safe and reliable manner; and, (2) existing training programs in place to ensure that work is performed in a safe and efficient manner. Any changes to these plans and programs necessitated by the increased DSIC spending will be addressed in PGW's revised LTIIP.

The revised LTIIP will show how the additional workload proposed by accelerated replacement is achievable. The revised LTIIP will include provisions for the use of staff and/or subcontractor crews to perform main replacements and will explain how PGW will be able to increase spending to the proposed level – in short, all the information that I&E has requested. As previously noted, PGW's proposed revised LTIIP should be considered by the Commission prior to May, 2016 when PGW projects it would begin to expend incremental DSIC billings.

Q. WILL THE WORKFORCE MANAGEMENT AND TRAINING PROGRAM IN THE REVISED LTIIP SATISFY OCA'S CONCERNS, AS STATED IN OCA STATEMENT NO. 1, AT 3-4, 6-9, 11-12, CONCERNING THE AVAILABILITY OF QUALIFIED PERSONNEL?

A. Yes, the revised LTIIP will identify the qualified personnel or contractors that will be used to meet the proposed additional main replacement.

Q. IS A SEPARATE STAFFING AND TRAINING PLAN NECESSARY?

A. No. I&E witness Hornesky appears to suggest that PGW should file a separate staff and training plan. I&E Statement No. 3, at 7-8. There is no justification for such a plan. A workforce management and training program is a required element of an LTIIP.[10]

Q. IS A SEPARATE ANNUAL REPORT ON STAFFING AND TRAINING NECESSARY?

A. No. I&E witness Hornesky also appears to suggest that PGW should file a separate annual report on staffing and training measures performed in the past year. I&E Statement No. 3, at 8. Similarly, OCA witness Everette suggests that PGW should file separate quarterly reports about its training efforts, qualifications of contractors, the performance of said contractors, categories of main replaced, and leak trends.[11] OCA Statement No. 1, at 9, 20.

There is no justification for such separate, additional reports, either on an annual or quarterly basis, of the workforce management and training program or on the other matters suggested. Under the Commission's LTIIP rules, PGW is required to submit an Annual Asset Optimization Plan which must report on its compliance with its LTIIP in the prior year, as well as how it proposes to meet its obligations in the year ahead.[12] This report should provide all the relevant information for the Commission and other parties to

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10 *See Petition of Philadelphia Gas Works For Approval of its Long-Term Infrastructure Improvement Plan*, PUC Docket No. P-2012-2337737, et al., Opinion and Order entered on April 4, 2013, at 4-5, 21-23; Implementation of Act 11 of 2012, PUC Docket No. M-2012-2293611, Final Implementation Order entered August 2, 2013, at 17-18.

11 I would note that the Commission already requires PGW to file a quarterly leak report. *Petition of Philadelphia Gas Works For Approval of its Long-Term Infrastructure Improvement Plan*, PUC Docket No. P-2012-2337737, et al., Opinion and Order entered on April 4, 2013, at Ordering Paragraph 4. Relevant data on leaks is included in that report, and there is no need for a new reporting requirement regarding leaks.

12 52 Pa. Code § 121.6.

evaluate whether PGW is on track with plans to attract and train qualified operators etc. Requiring the Company to develop and implement these additional reports is an unnecessary diversion of the Company's resources which does not appear to add any useful value here. Moreover, as far as I am aware, no other gas or electric utility with a DSIC has been required to make such filings.

Finally, an underlying basis for these recommendations appears to be the conclusion that the workforce management and training program should be subject to annual or quarterly review for compliance purposes though neither I&E nor OCA explain why. Notably, 52 Pa. Code § 121.8 states that "[c]ompliance with the LTIIP will be evaluated on a multiyear basis over the life of the LTIIP." Thus, there is no basis for requiring the Company to file additional annual or quarterly reports.

Q. SHOULD PGW BE REQUIRED TO ACTUALLY SPEND AND PERFORM ACCELERATED MAIN REPLACEMENT AT HIGHER LEVELS BEFORE BEING PERMITTED TO RECOVER INCREMENTAL DSIC MONIES?

A. No. OCA suggests that experience (actual spending and construction) above the current DSIC limitation (or cap) of 5% of billed distribution revenues should be required before the DSIC limitation can be increased. See OCA Statement No. 1, at 7-8. That suggestion is misplaced. First, as noted above, within fifteen days of a PUC order authorizing the increased DSIC level, PGW will submit a revised LTIIP which shall document how it intends to expend the additional $11 million in DSIC financing that would be provided by approving PGW's Petition. The PUC will be able to evaluate PGW's plan prior to PGW expending the incremental dollars. In the unlikely event it rejects PGW's proposed LTIIP, the Company will return the additional dollars to customers with interest.

Moreover, the Company has for several years replaced at least 18 miles of cast iron main through its program in its base rates. Since mid-2013 it has successfully implemented its initial, 5% DSIC financed, accelerated main replacement program. Through those efforts, PGW successfully replaced over 28 miles in Fiscal Year 2014 and 29 miles in Fiscal Year 2015. Prior to filing its Petition, PGW conducted a careful analysis of its work force and manpower availability and its ability to absorb a further acceleration. Based on what is currently known, PGW is reasonably confident that it will be able to reach a $33 million level of replacement, barring unforeseen circumstances.

I would also note that, in 2013, PGW had no prior experience of completing the accelerated levels of work defined by our current LTIIP; however after a reasonable ramp up period, the Company was not only able to meet the mileage target it committed to, but exceeded it.

It is well to again point out, however, that if PGW, for some reason, is not able to fully expend the $33 million accelerated program it will refund any such unspent amounts to ratepayers with interest.

VI. CONCLUSION

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

VERIFICATION

I, Daniel P. Murray, hereby state that: (1) I am the Senior Vice President of Customer Affairs and Operations for Philadelphia Gas Works; (2) the facts above set forth in the foregoing document are true and correct (or are true and correct to the best of my knowledge, information and belief); and (3) that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Daniel P. Murray

Exh DPM-1

Philadelphia Gas Works
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December 3, 2012

VIA EXPRESS MAIL

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
2nd Floor, 1 North
400 North Street
Harrisburg, PA 17120

RE: Philadelphia Gas Works Long Term Infrastructure Improvement Plan
Docket No. P-2012-

Dear Secretary Chiavetta,

Philadelphia Gas Works ("PGW") hereby files its Long Term Infrastructure Improvement Plan pursuant to 66 Pa.C.S.A. § 1352 and the Pennsylvania Public Utility Commission's August 2, 2012 Final Implementation Order (Docket No. M-2012-2293611). PGW requests that the following be entered as counsel for the Company in this proceeding:

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Please contact me if you have any questions regarding this filing.

Respectfully submitted,

Gregory J. Stunder

Enclosures

cc:

Chairman Robert F. Powelson
Vice Chairman John F. Coleman Jr.
Commissioner Wayne F. Gardner
Commissioner James H. Cawley
Commissioner Pamela A. Witmer
Bohdan R. Pankiw, Chief Counsel
Paul Diskin, Director of Technical Utility Services
Certificate of Service

PHILADELPHIA GAS WORKS
LONG TERM INFRASTRUCTURE IMPROVEMENT PLAN

I. INTRODUCTION

On February 14, 2012, Act 11[1] was signed into law, thereby providing Pennsylvania natural gas utility companies with a recovery mechanism (i.e. a Distribution System Improvement Charge ("DSIC")) for the costs related to distribution system repair, improvement and replacement. In order for a natural gas utility company to implement a DSIC, it must submit a Long-Term Infrastructure Improvement Plan ("LTIIP" or "Plan") and petition the Pennsylvania Public Utility Commission ("Commission") for review and approval of a proposed DSIC. Although Act 11 does not permit the submission of DSIC petitions before January 2, 2013, the Commission has encouraged the submission of LTIIPs before 2013. Accordingly, PGW is submitting the following LTIIP.

PGW has made substantial strides in its cast iron main and steel service[2] replacement programs over the last 15 years by replacing and/or removing approximately 250 miles of cast iron main and 150,000 steel services[3] with plastic and protected coated steel. The Company's primary objective for its LTIIP will continue to be improvement of safety and reliability of its infrastructure through the reduction of its cast iron main inventory and, after all cast iron main is removed from service, the removal of the Company's unprotected coated steel and ductile iron main.[4]

[1] Act 11 of 2012 which amends Chapters 3, 13 and 33 of the Pennsylvania Public Utility Code.
[2] Services are also referred to as service lines".
[3] Based on 2011 and 1996 Annual DOT Gas Distribution System Reports.
[4] PGW prioritizes main replacement this way because the risk of a future incident on unprotected coated steel and ductile iron mains is inherently low compared to cast iron mains. Also, the risk of a future incident is low due to low operating pressures, the inherently slow development of leaks on unprotected coated steel and ductile iron mains and PGW's leak survey procedures. Similarly, PGW's risk of a future incident with its unprotected bare

In formulating its proposed accelerated replacement program for the 2013-2017 time period, PGW was informed both by its traditional risk management analysis programs[5] as well as experience from recent incidents at PGW and other natural gas distribution companies ("NGDCs"). PGW's goal was to identify categories of cast iron main that would be the most prudent to replace based on an overall evaluation of all serviceability[6] factors. That analysis produced the following recommended accelerated replacement program:

1) 12 inch and smaller high pressure main ("HP" or "10-35 psig")
2) 30 inch high pressure main ("HP" or "10-35 psig")
3) 8 inch and smaller low to intermediate pressure main ("LP/IP" or "4.5 inches WC to 5 psig")

PGW's proposed approach under this LTIIP will give greater priority to the removal of 12 inch and smaller HP mains (due to recent incidents with 12 inch main on PGW's and UGI's distribution systems) and 30 inch HP mains (due to PGW's recent discovery of localized corrosion on a section of 30 inch HP main), thereby removing these entire categories of main from PGW's system by 2023. It also accelerates the removal of 8 inch and smaller diameter LP/IP cast iron main. Currently, PGW is removing cast iron main from inventory at a rate of 18 miles per year for all sizes. If PGW's proposed LTIIP is approved, PGW will remove cast iron main from inventory at a rate of approximately 25 miles per year.

PGW believes that the costs of these proposed accelerated replacements are fully recoverable through the DSIC mechanism that it intends to propose in 2013. In order to assure that PGW's current financial situation is not adversely impacted, PGW will need to scale back

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and coated steel services is also low for the aforementioned reasons. Additionally, the risk profiles for plastic and protected coated steel mains and services do not indicate the need for replacement.

[5] As discussed later, these include PGW's Distribution Integrity Management Program ("DIMP"), benchmarking analyses/studies along with the Company's main replacement prioritization model.

[6] i.e., fit for service.

the accelerated replacement proposed in this LTIIP if the PUC declines to permit such full recovery through the DSIC.

The passage of Act 11 has provided a significant opportunity to accelerate the improvement of the safety and reliability of PGW's gas distribution system in the most cost effective manner and without creating financial challenges for the Company. Through this plan, PGW hopes to embrace this opportunity and believes that it has created a replacement plan that accelerates replacement in the most efficient and targeted manner possible. This, in turn, will provide benefits to PGW, its customers and Philadelphia in general.

II. LONG TERM INFRASTRUCTURE IMPROVEMENT PLAN

Act 11 and the Commission's August 2012 Implementation Order set forth the following elements to be included in a LTIIP:

A.) Identification of the types and age of eligible property owned or operated by the utility for which the utility would seek recovery under this subchapter.
B.) An initial schedule for the planned repair and replacement of eligible property.
C.) A general description of the location of the eligible property.
D.) A reasonable estimate of the quantity of eligible property to be improved.
E.) Projected annual expenditures to implement the plan and measures taken to ensure that the plan is cost effective.
F.) The manner in which the replacement of aging infrastructure will be accelerated and how the repair, improvement or replacement will ensure and maintain adequate, efficient, safe, reliable and reasonable service.[7]
G.) A workforce management and training plan designed to ensure that the utility will have access to a qualified workforce to perform work in a cost-effective, safe and reliable manner.[8]

The Commission's August 2012 Implementation Order also sets forth that: the appropriate LTIIP time frame is five to ten years; the LTIIP should coincide with longer term plans which address specific goals, including cast iron replacement plans, bare steel replacement plans; and the Plan

[7] 66 Pa.C.S. §1352(a) – elements A to F.
[8] *Implementation of Act 11 of 2012* (Docket No. M-2012-2293611) August 2, 2012, p. 18.

should meet overall system replacement goals.[9] Accordingly, PGW's LTIIP is a five year plan which is focused on the specific goal of accelerated cast iron main replacement (PGW's distribution system does not contain any bare steel mains) and meets the Company's overall system replacement goals set forth in Section F below.

A.) Identification of the types and age of eligible property for which PGW is seeking recovery

Identification Tools and Considerations

PGW utilized several tools to formulate the PGW LTIIP proposed here:

- PGW's Distribution Integrity Management Program ("DIMP").[10]
- The Advantica Benchmarking Analysis, Risk Analysis and Model, Replacement Analysis and Computerized Main Prioritization and Ranking Program issued on June 2, 2008.[11]
- The Advantica Main Replacement Prioritization Model.[12]
- The GL Noble Denton (formerly d/b/a Advantica) 12-Inch 10-35 psig Cast Iron Mains Benchmarking Study issued on September 7, 2012.[13]
- Field Observations and System Performance Analysis.

PGW's DIMP includes a demonstration that PGW understands its distribution system, identifies the threats to its distribution system, evaluates these threats, ranks the related risks and lists strategies to mitigate those risks. The Advantica Benchmarking Analysis, which was

[9] *Id.* at 19.
[10] See Appendix A for more information about DIMP.
[11] See Appendix B for the Executive Summary from the June 2, 2008 analysis. Additionally, see section F for further discussion.
[12] See Appendix C for the excerpt from the June 2, 2008 Advantica Analysis which discusses the Main Replacement Prioritization Model. Additionally, see Section F for further discussion.
[13] See Appendix D for the Executive Summary from the September 7, 2012 Advantica Study. Additionally, see section F for further discussion.

updated in 2008[14], has enabled PGW to compare and validate its main replacement program with similarly-situated NGDCs. Additionally, the Advantica Main Replacement Prioritization Model, another tool that PGW has utilized for several years, enables PGW to identify the specific segments of pipe that should receive replacement priority. Finally, PGW utilized the results of the GL Noble Denton Benchmarking Study to provide the Company with replacement strategies for 12 inch high pressure mains.

PGW also considered other factors in order to identify infrastructure property for inclusion in the LTIIP, such as the recent incidents involving 12 inch mains on the PGW and UGI systems, and PGW's recent discovery of localized corrosion on a section of 30 inch HP main (10-35 psig operating pressure) plus surrounding ground conditions that contribute to main corrosion. Additionally, the Company will continue to review all cast iron inventory for any high pressure mains that are between 12 inches and 30 inches (i.e., 16, 20 and 24 inches – all HP) and that are redundant or under-utilized. Accordingly, PGW has targeted several abandonment projects for pipe inventory in this range.

Based on the DIMP risk ranking, the Advantica and GL Noble Benchmarking studies, the 12 inch main incidents, recent field observations of its 30 inch HP main and the prudency of beginning an abandonment program for redundant or under-utilized HP main (i.e., the Abandonment Program), the Company's proposed accelerated replacement program during the 2013-2017 time period will replace the following cast iron main types (categorized by size and pressure):

1) 12 inch and smaller, high pressure ("HP" or "10-35 psig").

2) 30 inch, high pressure ("HP" or "10-35 psig").

[14] A predecessor consultant prepared a similar benchmarking analysis in 2000 which was subsequently updated in 2002 and 2004.

3) 8 inch and smaller, low to intermediate pressure ("LP/IP" or "4.5 inches WC to 5 psig").

All of the above property proposed to be replaced is characterized as piping, couplings and valves and are "DSIC eligible," under Act 11.[15] PGW also plans to replace the unprotected bare and unprotected coated steel services and meter sets associated with these cast iron mains, and the related eligible property includes gas services lines, fittings, valves, risers, meter bars and meters with attached AMR devices. Also included in the Plan are the costs related to abandoning two (2) regulator stations and 2,400 feet of 12 inch steel main[16] and replacing them with 2,400 feet of 20 inch steel main. These facilities, too, are DSIC eligible pursuant to Act 11.

An important assumption in PGW's proposed LTIIP is that the annual cost of the accelerated main replacement program (which is $22 million over and above the amount it currently spends for its 18 mile cast iron main replacement program), will be recovered through PGW's DSIC tariff. PGW intends to file for and receive authority to include in its tariff a DSIC rider, in accordance with Act 11 and the Commission's guidance. PGW believes that the entirety of its additional $22 million in expenditures for accelerated main replacement is eligible for and should be recoverable in its DSIC. However, if for any reason the PUC determines to prohibit or limit DSIC recovery for these expenditures, PGW would be required to correspondingly reduce its accelerated main replacement plan.

[15] 66 Pa.C.S.A.§ 1351.

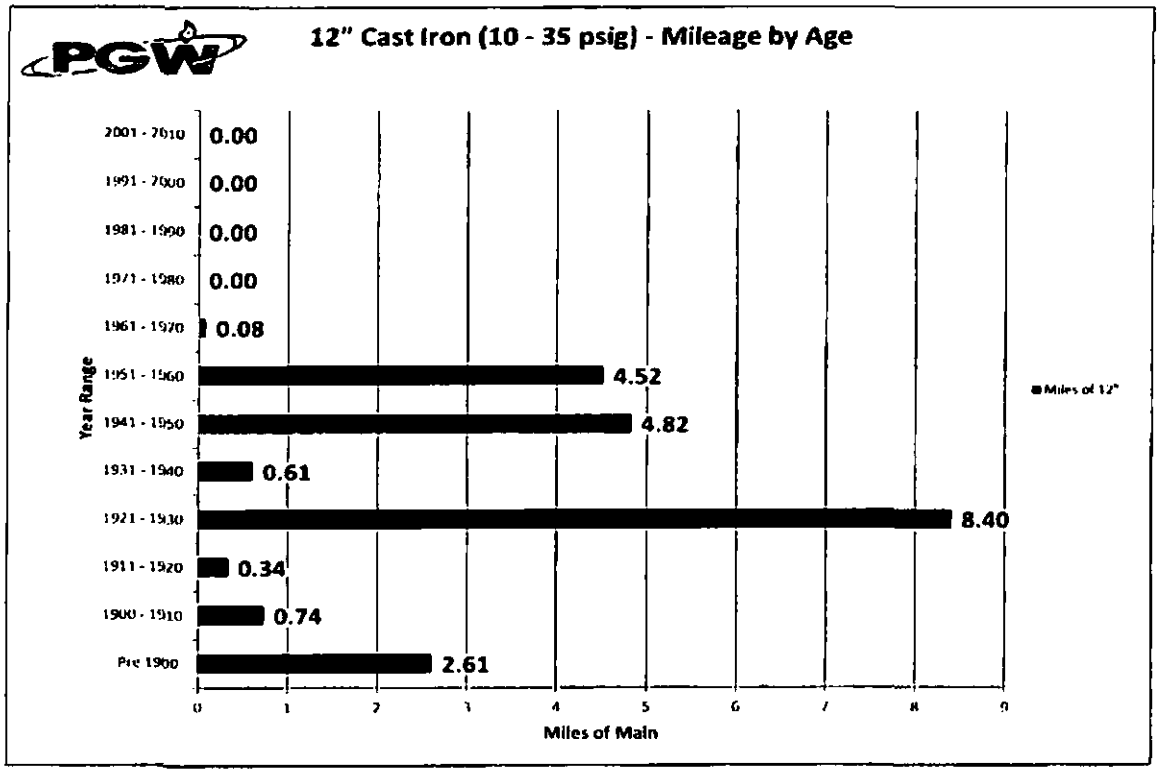
[16] Parts for the regulators on PGW's Somerton lateral are obsolete. In an effort to maintain public safety, load capacity studies were performed and concluded that this higher pressure line (150 psig) was no longer necessary. As a result, the Maximum Allowable Operating Pressure ("MAOP") of the line will be down rated and the obsolete regulator stations will be abandoned. New main will also be installed to maintain reliable service at a lower pressure. The cost to abandon these facilities and install new main is a more cost effective approach than the alternative of replacing, hydrostatically testing, maintaining and operating new regulator stations. Additionally, the reduced operating pressure reduces risk.

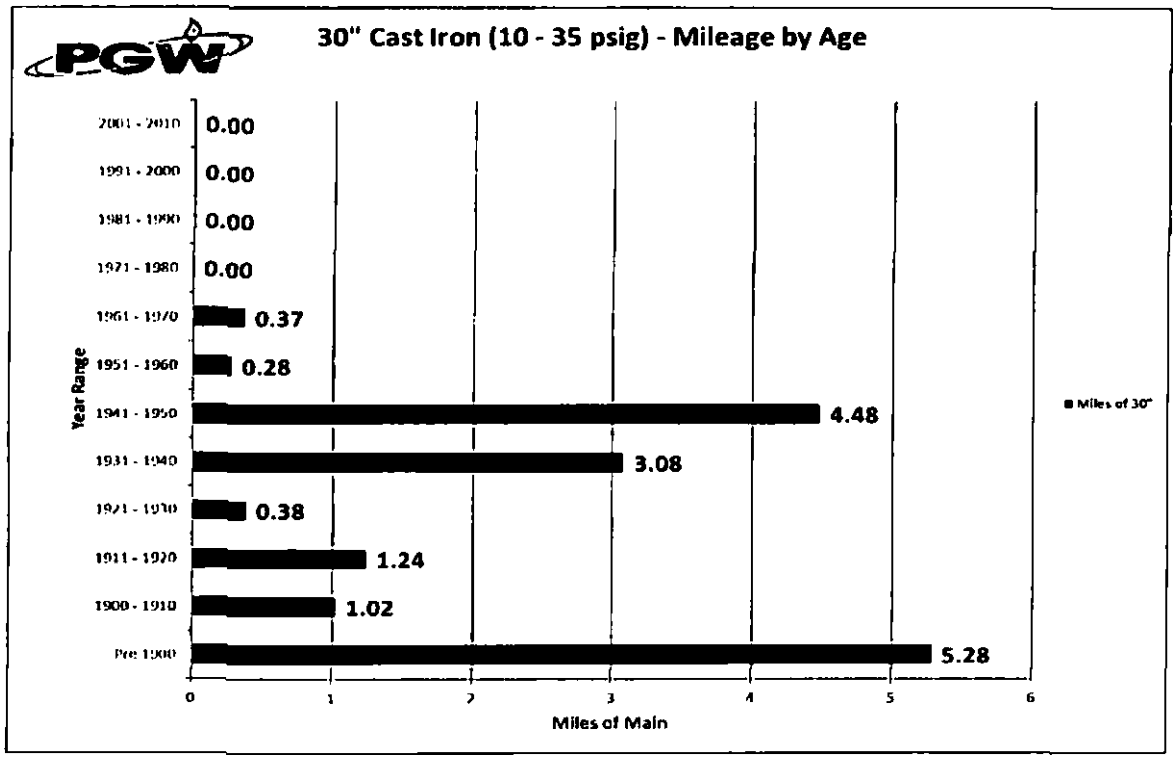
Age Range for Mains Included in LTIIP

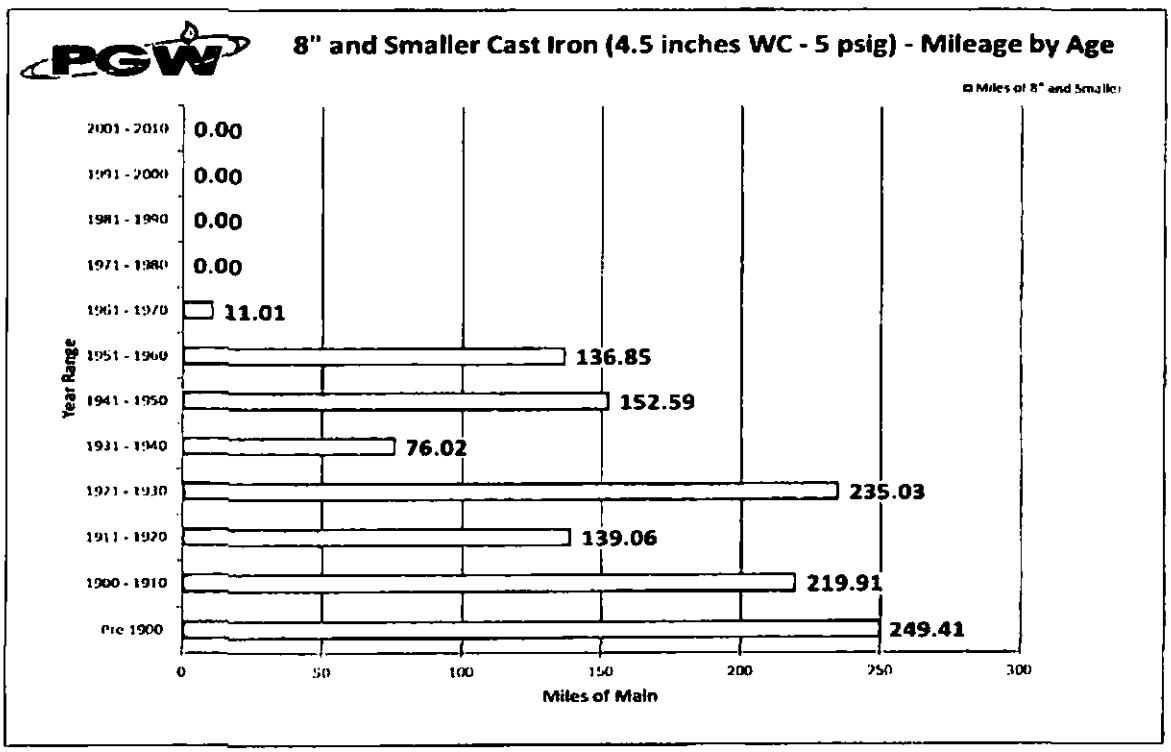
PGW's distribution system contains approximately 3,000 miles of mains and 3,000 miles of services. The following shows the approximate material composition of PGW's mains and services as of December 2011:

Mains	
Cast Iron	51%
Plastic & Protected Coated Steel	28%
Unprotected Coated Steel & Ductile Iron	21%
	100%
Services	
Plastic & Protected Coated Steel	72%
Bare Steel	23%
Unprotected Coated Steel	5%
	100%

The following charts show the total mileage by age range for the three cast iron main categories that PGW plans to replace during the five year period covered by this LTIIP:




30" Cast Iron (10 - 35 psig) - Mileage by Age
2001 - 2010
1991 - 2000
1981 - 1990
1971 - 1980
1961 - 1970
1951 - 1960
1941 - 1950
1931 - 1940
1921 - 1930
1911 - 1920
1900 - 1910
Pre 1900
0.00
0.00
0.00
0.00
0.37
0.28
4.48
3.08
0.38
1.24
1.02
5.28
Year Range
Miles of 30"
0
1
2
3
4
5
6
Miles of Main


8" and Smaller Cast Iron (4.5 inches WC - 5 psig) - Mileage by Age
Miles of 8" and Smaller
2001 - 2010
1991 - 2000
1981 - 1990
1971 - 1980
1961 - 1970
1951 - 1960
1941 - 1950
1931 - 1940
1921 - 1930
1911 - 1920
1900 - 1910
Pre 1900
0.00
0.00
0.00
0.00
11.01
136.85
152.59
76.02
235.03
139.06
219.91
249.41
Year Range
0
50
100
150
200
250
300
Miles of Main

B.) An initial schedule for the planned repair and replacement of eligible property

The first phase of PGW's LTIIP,[17] as described in the following chart of PGW's proposed accelerated replacement program, beginning during the Company's 2013 fiscal year (i.e. September 1, 2012 to August 31, 2013), will eliminate 343 miles of cast iron main with an estimated replacement cost of $776 million. Concurrent with this accelerated program, PGW will continue to remove 18 miles of cast iron main as part of its baseline main replacement program and the combined replacement total will be 1,258 miles of cast iron main with an estimated replacement cost of $2.43 billion. The following table shows the initial schedule for the complete replacement of this main:

PHASE 1 - ACCELERATED CAST IRON MAIN INVENTORY REDUCTION PROGRAMS BEGINNING IN 2013				
Size/Pressure	**Total Inventory Reduction Mileage**	**Cost**	**Begins**	**Completed**
12" & Smlr HP	22	$89,602,756	2013	2022
30" HP	16	$95,560,352	2013	2023
8" & Smlr LP/IP	305	$590,630,499	2013	2063
	343	$775,793,606		
Baseline 8" & Smlr LP/IP Program During Accelerated Inventory Reduction Period*				
Baseline*	915	$1,650,542,275	2013	2063
Acceleration	305	$590,630,499	2013	2063
8" & Smlr LP/IP	1,220	$2,241,172,773	2013	2063
Baseline + Accelerated - Phase 1				
12" & Smlr HP	22	$89,602,756	2013	2022
30" HP	16	$95,560,352	2013	2023
8" & Smlr LP/IP	1,220	$2,241,172,773	2013	2063
	1,258	$2,426,335,881		

[17] The first phase (i.e. "Phase 1") of PGW's Cast Iron Main Inventory Reduction Program begins during PGW's FY 2013. A table is provided in Section F.1. which outlines the Reduction Program for Phases 2 through 5.

C.) A general description of the location of the eligible property

1) There are approximately 22 miles of 12 inch and smaller HP cast iron main (10 to 35 psig) composed of 752 individual pipe segments[18] (segments vary in length from 1 foot to 2,000 feet) located throughout the city of Philadelphia.
2) There are approximately 16 miles of 30 inch HP cast iron main (10 to 35 psig) composed of 545 individual pipe segments (segments vary in length from 1 foot to 1,900 feet) located throughout the city of Philadelphia.
3) There are approximately 1,220 miles of 8 inch and smaller LP/IP cast iron main (4.5 inches WC to 5 psig) composed of 72,500 individual pipe segments (segments vary in length from 1 foot to 2,000 feet) located throughout the city of Philadelphia.

D.) A reasonable estimate of the quantity of eligible property to be improved

The information responsive to Section D is included in Section E.

E.) Projected annual expenditures to implement the plan and measures taken to ensure that the plan is cost effective

1. Projected annual expenditures to implement the plan

PGW's current base line main replacement program removes 18 miles of cast iron main annually and the Company will seek recovery, via the DSIC, for expenditures above the cost of the base line program on a pay as you go basis ("paygo") in its DSIC petition. More specifically, PGW does not plan to issue any long term debt to fund its accelerated main replacement program. Rather, it plans to seek recovery of $22 million annually via a DSIC surcharge for the first five years of its program and plans to spend a corresponding $22 million annually for its

[18] A segment is a section of main that shares all of the following characteristics: material, size, pressure and age.

accelerated main replacement program. PGW plans to fund the program via the DSIC on a paygo basis because absent such recovery, PGW would be required to issue long term debt to fund the acceleration and, in turn, seek recovery of the costs through a base rate proceeding. Such a process would not only increase costs to consumers and negatively affect PGW's cash flow and internally generated funds, but would also adversely affect PGW's debt to equity ratio. In turn, this could negatively affect PGW's bond ratings.[19]

PGW is projecting $22 million in annual spending because, in PGW's view, that is the amount permitted under the 5% consumer protection cap on DSIC revenue recovery. PGW is calculating the 5% cap based on distribution revenues (i.e. non-gas revenues) from its most recent base rate case.[20] At the projected $22 million spending level, the following is an estimate of the quantity of eligible property to be improved and the projected annual expenditures to implement the accelerated replacement plan:

[19] 52 Pa.Code § 69.2703.

[20] *PaPUC v. PGW* (Docket No. R-2009-2139884) Joint Petition for Settlement – May 12, 2010; Rates Effective – September 1, 2010.

Long Term Infrastructure Improvement Program Annual Schedule, Quantities and Expenditures
Five Year Period - FY 2013 to FY 2017

QUANTITIES	FY 2013 (miles)	FY 2014 (miles)	FY 2015 (miles)	FY 2016 (miles)	FY 2017 (miles)
CURRENT BASELINE PROGRAM					
8" & Smaller LP/IP	18.00	18.00	18.00	18.00	18.00
ACCELERATED PROGRAM					
12" HP	1.84	2.16	2.04	2.04	2.50
30" HP	1.45	1.70	1.86	1.78	1.38
8" & Smaller LP/IP	2.97	3.04	2.97	2.98	3.01
Abandonment for Non-Use	2.08	0.00	0.00	0.00	0.00
ACCELERATED TOTALS	8.33	6.90	6.87	6.79	6.89
Yearly Totals	**26.33**	**24.90**	**24.87**	**24.79**	**24.89**

EXPENDITURES	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Regulator Station / Valve Work	$2,500,000	$1,270,000	$500,000	$500,000	$500,000
12" HP	$6,785,800	$8,139,600	$7,832,651	$7,989,304	$10,001,673
30" HP	$7,782,600	$9,311,580	$10,399,838	$10,174,862	$8,059,790
8" & Smaller LP/IP (Additional)	$3,131,600	$3,278,820	$3,267,510	$3,335,833	$3,438,537
Abandonment for Non-Use	$1,800,000	$0	$0	$0	$0
Yearly Totals	**$22,000,000**	**$22,000,000**	**$22,000,000**	**$22,000,000**	**$22,000,000**

2. Measures taken to ensure that the plan is cost effective

PGW is taking the following measures to ensure that the LTIIP is cost effective:

1) As discussed above, PGW is proposing to fund the accelerated program[21] on a paygo basis. This type of funding avoids the issuance of long term debt, thereby saving ratepayers the related interest expense plus the cash flow that must be included in rates necessary to cover certain debt service coverage ratios.

2) As discussed in more detail in section F below, PGW's Main Prioritization Model reduces future breakage repair costs.

[21] i.e. the accelerated totals above the baseline 18 mile program.

3) As discussed in Section G below, PGW will utilize a competitive bidding process. Additionally, the Company is seeking new contractors for main installation in an effort to create a larger bidding pool and more competitive bid prices.

F.) The manner in which the replacement of aging infrastructure will be accelerated and how the repair, improvement or replacement will ensure and maintain adequate, efficient, safe, reliable and reasonable service

1. Acceleration

As set forth in more detail in the following table, PGW proposes to accelerate its replacement of its 8 inch and smaller cast iron main inventory (totaling 1,220 miles) by 17 years, and accelerating the replacement of all 12 inch and 30 inch high pressure cast iron main by more than 60 years.

PHASE 1 - ACCELERATED CAST IRON MAIN INVENTORY REDUCTION PROGRAMS BEGINNING IN 2013

Size/ Pressure	Inventory Reduction Mileage	Inventory Reduction Accelerated By:	ACCELERATED Inventory Reduction Program			PRE-ACCELERATION Inventory Reduction Program		
			Cost	Begins	Ends	Cost	Begins	Ends
12"& Smlr HP*	22	67 Years	$89M	2013	2022	$354M	2085	2089
30" HP**	16	62 Years	$95M	2013	2023	$344M	2080	2085
8"&Smlr LP/IP*	1,220	17 Years	$2.2B	2013	2063	$2.7B	2013	2080
	1,258		$2.4B	***		$3.4B	***	

* As discussed later in this Section, PGW is prioritizing the inventory reduction of this main using its Main Replacement Prioritization model.

** PGW is currently prioritizing the inventory reduction of this main based upon corrosion and soil studies coupled with past operational

*** The difference in cost between the accelerated and pre-acceleration program is due to an annual 2% inflation factor and different

Phase 1 of PGW's accelerated program beginning in 2013 accounts for a total of 1,258 miles of cast iron main replacement. PGW considers the replacement of the initial 1,258 miles to be its first priority based upon identifying threats, evaluating these threats and ranking the related

risks.[22] After establishing this initial accelerated program, PGW will begin the next four phases of its accelerated replacement program in 2022 for the remaining 265 miles of cast iron main. The replacement periods for Phases 2 through 5 have been scheduled based upon the same threat identification, threat evaluation and risk ranking procedures. The following table shows the replacement periods beginning in 2022 and the number of years that replacement will be accelerated for each main category:

PHASES 2 THROUGH 5
ACCELERATED CAST IRON MAIN INVENTORY REDUCTION PROGRAMS BEGINNING IN 2022

Size/Pressure	Inventory Reduction Mileage	Inventory Reduction Accelerated By:	ACCELERATED Inventory Reduction Program			PRE-ACCELERATION Inventory Reduction Program		
			Cost	Begins	Ends	Cost	Begins	Ends
PHASE 2:								
20" HP	46	33 Years	$446M	2022	2068	$1.2B	2089	2101
16" HP	15	69 Years	$87M	2023	2036	$372M	2101	2105
24" HP	1	63 Years	$8M	2023	2025	$27M	2088	2088
PHASE 3:								
12" IP	3	42 Years	$27M	2063	2063	$61M	2105	2105
16" IP	1	42 Years	$11M	2063	2063	$25M	2105	2105
10" / 12" LP	101	14 Years	$1.4B	2065	2091	$2.9B	2105	2105
16" LP	45	50 Years	$681M	2068	2085	$2.0B	2125	2135
PHASE 4:								
20" / 24" LP	38	48 Years	$878M	2085	2097	$127M	2135	2145
PHASE 5:								
30"&Lgr LP	15	49 Years	$431M	2097	2100	$1.1B	2145	2149
	265		$3.9B*			$7.7B*		

* The difference in cost between the accelerated and pre-acceleration program is due to an annual 2% inflation factor and different inventory reduction time periods.

[22] As discussed in Section A above, PGW's Distribution Integrity Management Program identifies the threats to its distribution systems, evaluates these threats and ranks the related risks.

2. Ensuring and maintaining adequate, efficient, safe, reliable & reasonable service / ensuring that the plan is cost effective

a. PGW Studies and Evaluations Supporting Proposed LTIIP

In order to ensure that PGW's replacement program will maintain adequate, efficient, safe, reliable and reasonable service and ensure that the Plan is cost effective, PGW engaged Advantica in 2008 and GL Noble Denton[23] in 2012 to prepare benchmarking analyses and studies comparing PGW's replacement programs to other similarly situated utilities. As part of the 2008 engagement, PGW also implemented Advantica's Main Replacement Prioritization ("MRP") model which helps PGW assess the risk factors of PGW's 8 inch and smaller cast iron distribution system and prioritizes which pipe segments should be replaced. PGW is now implementing the same MRP model for a more focused review of its 12 inch and smaller high pressure cast iron main replacement program as part of the 2012 GL Noble Denton engagement.

i. Benchmarking Analysis, Risk Analysis and Model, Replacement Analysis and Computerized Main Prioritization and Ranking Program[24]

In 2008, PGW engaged Advantica to conduct a benchmarking study on the replacement of cast iron mains. This study benchmarked eight distribution utilities, including PGW, to determine cast iron main replacement strategies.[25] The seven other systems are all centered around a central inner city, and are thus considered to be the most-comparable benchmarks that could be used. These companies tended to operate large amounts of older, cast iron pipe and were predominantly located in the northeastern part of the U.S. The benchmarking study's most

[23] GL Noble Denton acquired Advantica in 2007 and Advantica eventually began doing business as "GL Noble Denton".
[24] See Appendix B for the Executive Summary from the June 2, 2008 analysis.
[25] The study also benchmarks a larger group of 27 companies (including PGW) for use as a broad comparison of industry standard practices.

notable comparison among the eight companies is the average percentage of cast iron main replaced each year.[26] Under this comparison, PGW's base line 18 mile replacement program was ranked as having the fifth highest replacement percentage of the eight companies. The study also provided PGW's ranking for a hypothetical replacement program of 24 miles which resulted in PGW's ranking moving up from the fifth highest to the second highest replacement percentage. This second highest ranking is important because it supports PGW's replacement program for the period of 2013 to 2017 which will replace approximately 25 miles of cast iron main annually (see Section D/E above).

ii. Advantica Main Replacement Prioritization Model[27]

The Advantica Main Replacement Prioritization ("MRP") model developed for PGW is based on a risk model originally developed for the gas industry in the United Kingdom ("UK"). The initial UK model was developed in 1980 and then refined beginning in 1995. The refinement of this model was based on actual historical failure data from one million cast iron and ductile iron pipe segments covering 20 years of failure data and 10 years of gas leakage which migrated into buildings and the related incident data. After being fully developed, a UK gas regulator endorsed the refined risk model in 2000 and this model is now used by all UK network gas companies as well as gas companies worldwide (including several U.S. natural gas distribution companies[28]).

[26] Based on a ten year average of cast iron main replacement for each of the eight companies.

[27] See Appendix C for the excerpt from the June 2, 2008 Advantica Analysis which discusses the Main Replacement Prioritization Model.

[28] The following U.S. natural gas distribution companies use the MRP Model: Philadelphia Gas Works (PA), Peoples Natural Gas (PA), Central Hudson Gas & Electric Corp. (NY), Consolidated Edison Company of New York (NY), Orange and Rockland Utilities, Inc. (NY), New Jersey Natural Gas Company (NJ), Public Service Electric & Gas Co (PSE&G) (NJ), City of Richmond (VA), Dominion Hope (WV), Michigan Consolidated Gas Co. (MichCon) (MI), Consumers Energy Company (MI), Nicor Gas (a division of AGL Resources) (IL) and MidAmerican Energy Company (IA).

PGW implemented Advantica's refined MRP model in 2008. As part of this implementation, PGW's detailed distribution system data (such as material, length, age, leak history, break history, etc.) for each pipe segment was input into the model. The model then analyzed the data, assessed the condition of each pipe segment and created a risk score for leakage / breakage per pipe segment. This scoring, in turn, is used by PGW to prioritize the replacement of pipe segments. Additionally, the MRP is a dynamic model and pipe segment data is updated annually so that the evolving condition of each pipe segment is factored into future risk scoring and replacement prioritization.

PGWs Advantica engagement also included evaluating a scenario in which PGW did not use a risk model for the prioritization of main replacement and compared it to various scenarios in which PGW did use a risk model with varying levels of cast iron main replacement. Advantica was able to evaluate these scenarios based upon its own modeling of extensive historical failure data from UK gas systems.[29] Advantica's assessment, after evaluating the PGW scenarios within the context its historical data model, concluded that prioritizing replacement by MRP risk score is the most effective way for PGW to:

- reduce serious incidents;
- reduce breakage repairs; and
- reduce future breakage repair costs.

As a result of the foregoing, PGW's main replacement program ensures and maintains adequate, efficient, safe, reliable and reasonable service because using the MRP model to prioritize main replacement reduces serious incidents. The main replacement program also ensures cost effectiveness because using the MRP model reduces future breakage repair costs.

[29] As referenced above, the MRP model contains actual historical failure data from one million cast iron and ductile iron pipe segments covering 20 years of failure data and 10 years of gas in building and incident data.

iii. GL Noble Denton (formerly d/b/a Advantica) 12-Inch 10-35 psig Cast Iron Mains Benchmarking Study[30]

In 2012, PGW engaged GL Noble Denton (formerly Advantica) to conduct a benchmark study on the replacement of large diameter cast iron mains. The study benchmarks nine distribution utilities, including PGW, to determine replacement strategies for 12-inch high pressure cast iron mains. The eight other systems are all centered around a central inner city predominantly located in the northeastern part of the U.S. and are thus considered to be the most-comparable benchmarks that could be used. These companies tended to operate large amounts of older, cast iron pipe. As part of the benchmark study, PGW requested that GL Noble Denton perform a replacement analysis on PGW's 12-inch cast iron mains to determine the proper replacement amount for reducing risk to an acceptable level.

Due to the recent incidents involving large diameter cast iron mains in the U.S., and the overall reduction of risk for the distribution system exhibited by PGW's marked reduction in all reportable incidents, GL Noble Denton concludes that replacing 2 miles of 12 inch high pressure cast iron main per year provides the proper balance of risk reduction for a utility operating in a congested area. Based on this conclusion, PGW is proposing to implement a replacement program beginning in 2013 (set forth above in Section D/E) which will remove an average of 2 miles annually of larger sized high pressure mains until all of its 12 inch high pressure mains are completely replaced (i.e., by 2022).

[30] See Appendix D for the Executive Summary from the September 7, 2012 study.

b. Distribution Integrity Management Program

PGW's LTIIP ensures and maintains adequate, efficient, safe, reliable and reasonable service because it reduces risk consistent with the Company's Distribution Integrity Management Program ("DIMP"). PGW developed its DIMP in response to a recent Pipeline and Hazardous Materials Safety Administration (PHMSA) regulation which requires NGDCs to develop a written integrity management plan which, among other things:

- demonstrates an operator's understanding of its system;
- identifies the threats to its distribution system;
- evaluates the risks associated with its distribution pipeline;
- determines the relative importance of each threat;
- estimates and ranks the risks posed to its pipeline; and
- identifies the measures to address risks.

The development of a DIMP is a comprehensive process which requires an NGDC to make an assessment of its entire distribution system. It is among the most appropriate resources to use when determining the main categories to be replaced. Accordingly, PGW relied on its DIMP when it developed its current main replacement plan.

c. Field Observations

When a main is exposed, PHMSA's Office of Pipeline Safety regulation at 49 CFR § 192.459 requires NGDCs to observe whether localized corrosion appears on the exposed main. Recently, PGW exposed a section of its 30 inch HP main and discovered localized corrosion. Consequently, PGW studied two smaller segments of the exposed main and also discovered

ground conditions which contribute to main corrosion.[31] As a result of the foregoing, PGW has included the replacement of 30 inch high pressure main in its LTIIP.

d. Prudent Replacement

PGW has determined that it's also prudent to continue its distribution system evaluation to determine if there are any segments of redundant or under-utilized main that can be removed from service and still maintain adequate, efficient, safe, reliable & reasonable service. As a result PGW has targeted several large segments of 20" & 12" main that can be removed from service and abandoned. Because PGW's distribution system is dynamic due to changing load requirements and customer demands, PGW will closely monitor its cast iron main inventory for opportunities to remove/abandon any high pressure main that is between 12 inches and 30 inches (i.e. 16, 20 and 24 inches – all HP). If any main segment is determined to be redundant or under-utilized among the 16, 20 and 24 inch HP main inventories, PGW will take the proper steps to remove these segments from service.

G.) The workforce management and training plan designed to ensure that the utility will have access to a qualified workforce to perform work in a cost-effective, safe and reliable manner

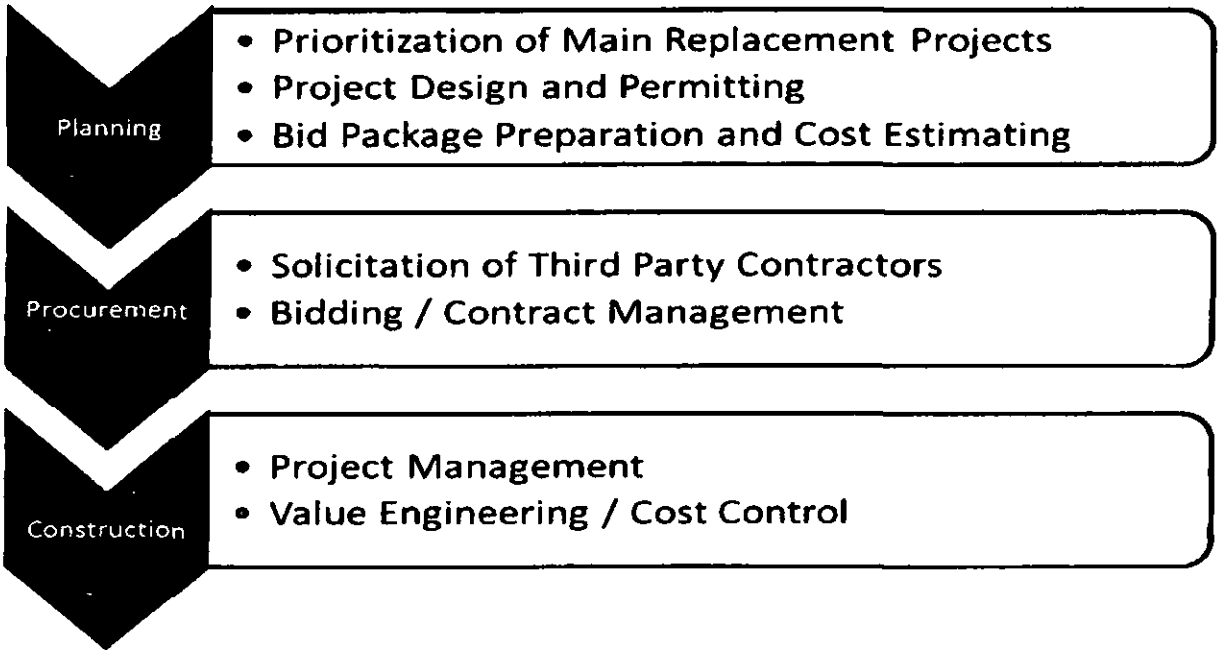
1. Workforce Management

As discussed in earlier sections of this document, PGW's baseline main replacement program currently removes 18 miles of 8" and smaller cast iron main and associated steel services annually. The proposed LTIIP is a continuation of PGW's current main replacement program, supplemented with accelerated 8" and smaller and 12" and larger cast iron main replacement. To ensure the proposed LTIIP is successful, PGW currently has departmental

[31] i.e. the soil pH and the moisture content of the soil.

structures and staffing in place for the prioritization, design, contracting, execution and cost control of main replacement projects.

Planning, Procurement and Construction

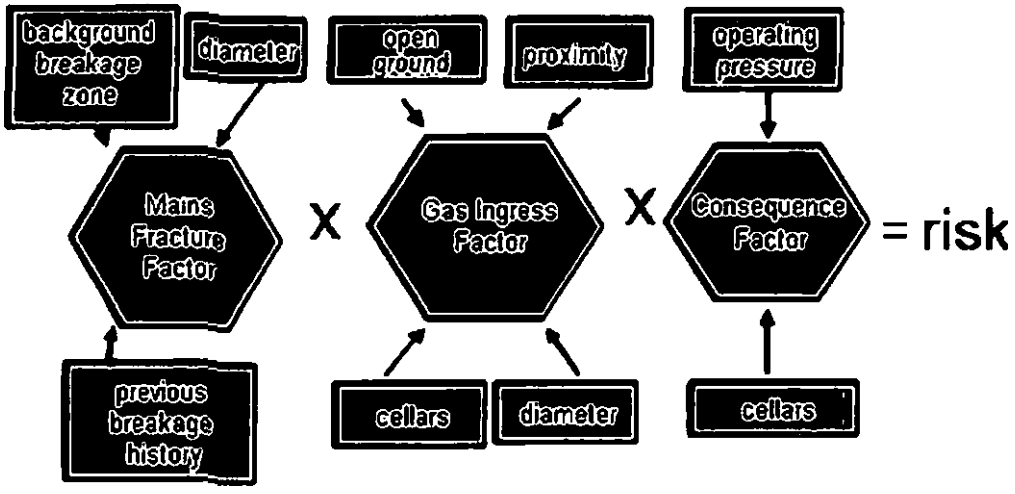


Planning

The Planning Section is responsible for designing, permitting, drafting and cost estimating the majority of PGW's main / service replacements and installations.

As stated above, PGW's current main replacement policy utilizes a Main Replacement Prioritization (MRP) program, developed by GL Noble Denton (formerly Advantica), which targets 8" and smaller cast iron mains for replacement based on parameters such as main size, break history, leak history, pipe age, service length (i.e. proximity to buildings) and gas leakage migration patterns into buildings. Each section of main in the system is evaluated and given a risk score based on a weighting scheme assigned to each parameter (i.e. risk, condition, gas

leakage migration patterns AKA front wall indicator, etc.). The sections of main are then ranked by their risk score to determine the priority of replacement.



MRP utilizes GIS[32] as its platform; this enables PGW to incorporate information from a variety of additional sources into the risk-and-condition assessment. The highest ranked main sections are then grouped into projects which incorporate surrounding cast iron mains in the project. After the projects are grouped, construction documents, bid packages for contractor assistance and project cost estimates are developed and sent to PGW's Supply Chain Department for distribution to third party contractors.

Procurement

PGW's Supply Chain Department administers a standardized public works contracting bid procedure as mandated by state and local law for soliciting contractors to perform main installation and paving restoration as part of the main replacement program. This process includes the following:

[32] GIS is a Geographic Information System which integrates hardware, software and data for capturing, managing, analyzing, and displaying all forms of geographically referenced information.

- Identification of Vendors;
- Issuance of the bid Request for Quotation (RFQ);
- Bid Evaluation and Vendor Selection;
- Internal Accounting Approvals / Board Approvals; and
- Awarding of Bid / Collection of Performance Bonding and Insurance Certificates.

Contractors for this specific type of work are qualified by PGW prior to being invited to bid. The qualification includes review of background information such as financial statements, safety performance, minority participation performance and training records.

Construction

After the contract is awarded, the Construction Section of PGW's Distribution Department is responsible for the execution of the contract. This group schedules, monitors and evaluates overall program / project progress and associated costs.

Third party contractors and PGW skilled workers are utilized for all main replacement projects. Third party contractors excavate, install, pressure test with air and backfill new mains under the direct supervision of a qualified PGW construction inspector. The construction inspector is required to monitor and confirm that PGW's installation standards, safety performance standards and all contractual obligations are met.

Once the new main has been installed and tested, PGW's workforce mobilizes to energize the new main, replace existing steel services or reconnect existing plastic services and de-energize the existing main under the supervision of a PGW construction supervisor. Under certain circumstances, such as short unanticipated cutouts or small replacement projects, PGW crews are also utilized to install main. At the present time, only PGW employees are authorized

and trained to work on live gas (currently energized gas mains and services). Additionally, four PGW supervisors monitor the work performed by PGW's workforce for quality, timeliness of work, safety performance and customer satisfaction.

Measures Taken / Action Items

In addition to PGW's current workforce structure for main replacement, proactive measures have been taken to increase the probability of a successful accelerated main replacement program. These measures include, but are not limited to:

- A clause allowing contractors to perform live gas work under certain circumstances was included in the most recent collective bargaining agreement between the Philadelphia Gas Works and Gas Works Employees' Union of Philadelphia, Local 686.
- PGW contracted with a consultant for main replacement design work to prepare construction drawings and associated documents. The use of this design consultant will help PGW with the increased drawing/document preparation workload related to the accelerated main replacement program. Additional consultants may be added depending upon work load.
- PGW has been soliciting the services of additional outside contractors to perform main installation in an effort to keep contracts cost competitive.
- PGW is currently evaluating the services of an outside project management consulting firm to assist in the development and execution of construction processes and procedures for our accelerated main replacement program.

- PGW is currently developing a Main Replacement Prioritization (MRP) program for 12" and larger cast iron main replacement in addition to the present 8" and smaller MRP program.
- PGW is currently evaluating the need of adding additional vehicles and mobile equipment for its increased replacement plan.

2. Training Plan

PGW Training

PGW's Distribution Department currently employs skilled workers to perform operation, maintenance and construction activities on PGW's distribution system. These employees are trained and qualified to the standards set forth in US Department of Transportation, Office of Pipeline Safety Regulation Title 49 CFR 192 Subpart N, via PGW's Natural Gas Pipeline System Operator Qualification Plan (effective April 26, 2001).

The purpose of the above mentioned Natural Gas Pipeline System Operator Qualification Plan is to ensure safe and efficient natural gas service by establishing objective criteria of required qualifications for all persons performing safety-sensitive operations and maintenance tasks on PGW's gas piping system. This plan also ensures, through evaluation, that each person performing safety sensitive tasks on PGW's pipeline system is: 1) able to perform these tasks; 2) able to recognize and respond appropriately to abnormal operating conditions; and 3) able to maintain necessary records to administer this plan.

PGW has a dedicated Training Section which provides classroom training as well as simulated and/or actual field training each time a PGW employee is promoted to a new position. Every employee is tested on their ability to perform every assigned task within an associated job

title. Employees are evaluated on their knowledge, skill and ability related to each task as well as their ability to react to abnormal operating conditions.

In addition to the classroom training for promotional job titles, PGW has instituted annual training classes for all field and management personnel that covers such tasks as: proper trench shoring techniques, leak investigation and migration practices, damage prevention methodologies, proper use of gas detection instrument, plastic pipe fusion qualifications, steel pipe welding qualifications and proper respirator use.

Contractor Training

In addition to the financial and technical screening performed by the Procurement Section, the Training Section tests and qualifies PGW's outside contractor workforce in plastic pipe fusion and steel welding practices. Additionally, now that the most recent Collective Bargaining Agreement permits outside contractors to work on live gas, the Training Section has established procedures to qualify contractors for live gas work.

III. CONCLUSION

PGW's LTIIP satisfies the requirements set forth by 66 Pa.C.S.A. §1352 and the Commission's Final Implementation Order by:

- identifying the types and age of eligible property owned or operated by the utility for which the utility will seek recovery;
- providing an initial schedule for the planned repair and replacement of eligible property;
- providing a general description of the location of the eligible property;
- providing a reasonable estimate of the quantity of eligible property to be improved;

- providing projected annual expenditures to implement the plan and demonstrating that measures taken will ensure that the plan is cost effective;
- identifying the manner in which the replacement of aging infrastructure will be accelerated and demonstrating how the repair, improvement or replacement will ensure and maintain adequate, efficient, safe, reliable and reasonable service; and
- providing a workforce management and training plan designed to ensure that the utility will have access to a qualified workforce to perform work in a cost-effective, safe and reliable manner.

As a result of the foregoing, PGW's LTIIP is adequate and sufficient to ensure and maintain adequate, efficient, safe, reliable and reasonable service. Accordingly, PGW respectfully requests that the Commission approve this Plan.

Distribution Integrity Management Program ("DIMP")

The Pipeline and Hazardous Materials Safety Administration (PHMSA) published the final rule establishing integrity management requirements for gas distribution pipeline systems on December 4, 2009 (74 FR 63906). Operators were given until August 2, 2011 to write and implement their Distribution Integrity Management Program ("DIMP").

The following is the complete text of the regulation which sets forth the DIMP elements:

49 C.F.R. § 192.1007 What are the required elements of an integrity management plan?

A written integrity management plan must contain procedures for developing and implementing the following elements:

(a) Knowledge. An operator must demonstrate an understanding of its gas distribution system developed from reasonably available information.

(1) Identify the characteristics of the pipeline's design and operations and the environmental factors that are necessary to assess the applicable threats and risks to its gas distribution pipeline.

(2) Consider the information gained from past design, operations, and maintenance.

(3) Identify additional information needed and provide a plan for gaining that information over time through normal activities conducted on the pipeline (for example, design, construction, operations or maintenance activities).

(4) Develop and implement a process by which the IM program will be reviewed periodically and refined and improved as needed.

(5) Provide for the capture and retention of data on any new pipeline installed. The data must include, at a minimum, the location where the new pipeline is installed and the material of which it is constructed.

(b) Identify threats. The operator must consider the following categories of threats to each gas distribution pipeline: corrosion, natural forces, excavation damage, other outside force damage, material or welds, equipment failure, incorrect operations, and other concerns that could threaten the integrity of its pipeline. An operator must consider reasonably available information to identify existing and potential threats. Sources of data may include, but are not limited to, incident and leak history, corrosion control records, continuing surveillance records, patrolling records, maintenance history, and excavation damage experience.

(c) Evaluate and rank risk. An operator must evaluate the risks associated with its distribution pipeline. In this evaluation, the operator must determine the relative importance of each threat and estimate and rank the risks posed to its pipeline. This evaluation must consider each applicable current and potential threat, the likelihood of failure associated with each threat, and the potential consequences of such a failure. An operator may subdivide its pipeline into regions with similar characteristics (e.g., contiguous areas within a distribution pipeline consisting of mains, services and other

appurtenances; areas with common materials or environmental factors), and for which similar actions likely would be effective in reducing risk.

(d) Identify and implement measures to address risks. Determine and implement measures designed to reduce the risks from failure of its gas distribution pipeline. These measures must include an effective leak management program (unless all leaks are repaired when found).

(e) Measure performance, monitor results, and evaluate effectiveness.

(1) Develop and monitor performance measures from an established baseline to evaluate the effectiveness of its IM program. An operator must consider the results of its performance monitoring in periodically re-evaluating the threats and risks. These *performance measures must include the following:*

(i) Number of hazardous leaks either eliminated or repaired as required by § 192.703(c) of this subchapter (or total number of leaks if all leaks are repaired when found), categorized by cause;

(ii) Number of excavation damages;

(iii) Number of excavation tickets (receipt of information by the underground facility operator from the notification center);

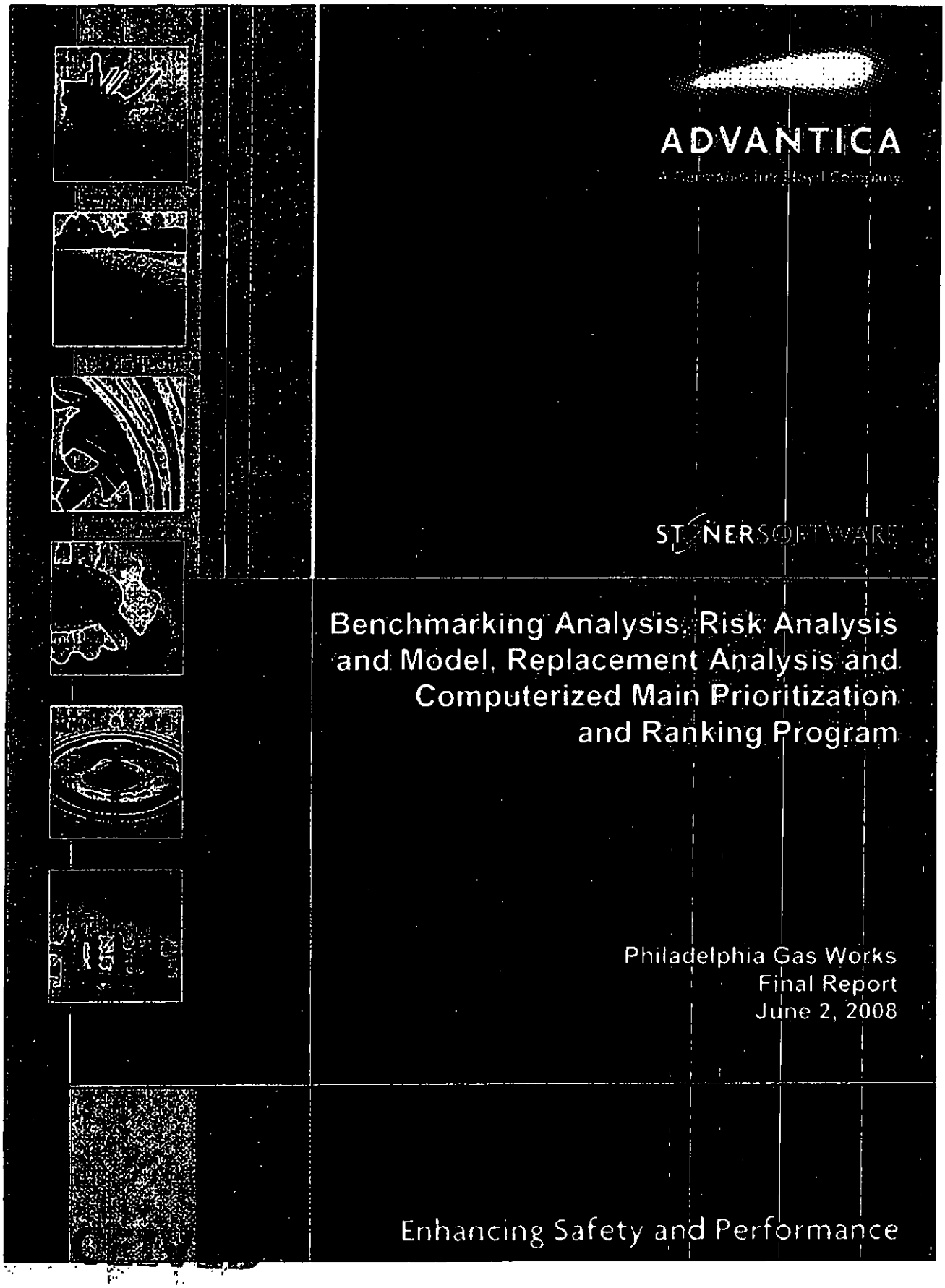
(iv) Total number of leaks either eliminated or repaired, categorized by cause;

(v) Number of hazardous leaks either eliminated or repaired as required by § 192.703(c) (or total number of leaks if all leaks are repaired when found), categorized by material; and

(vi) Any additional measures the operator determines are needed to evaluate the effectiveness of the operator's IM program in controlling each identified threat.

(f) Periodic Evaluation and Improvement. An operator must re-evaluate threats and risks on its entire pipeline and consider the relevance of threats in one location to other areas. Each operator must determine the appropriate period for conducting complete program evaluations based on the complexity of its system and changes in factors affecting the risk of failure. An operator must conduct a complete program re-evaluation at least every five years. The operator must consider the results of the performance monitoring in these evaluations.

(g) Report results. Report, on an annual basis, the four measures listed in paragraphs (e)(1)(i) through (e)(1)(iv) of this section, as part of the annual report required by § 191.11. An operator also must report the four measures to the state pipeline safety authority if a state exercises jurisdiction over the operator's pipeline.



ADVANTICA

A Rolls-Royce plc Group Company

STONERSOFTWARE

Benchmarking Analysis, Risk Analysis and Model, Replacement Analysis and Computerized Main Prioritization and Ranking Program

Philadelphia Gas Works
Final Report
June 2, 2008

Enhancing Safety and Performance

Executive Summary

Background

Advantica have been engaged by Philadelphia Gas Works (PGW) to carry out a study into their current mains replacement policy for cast iron and their future mains replacement requirements. As part of this study, a detailed benchmarking of their current position has been carried out by comparing their distribution system with that of comparable gas utilities in the U.S., in particular those centered on a central inner city. PGW have also agreed to implement Advantica's mains replacement software offering Mains Replacement Prioritization (MRP), to assist them in building future replacement plans, thus this report uses the results from some initial runs of MRP to determine recommended replacement levels with associated risk, going forward.

Benchmarking Study

The benchmarking study for PGW was extensive and the full results are contained within the main body of the report, but the main points arising from this exercise are detailed within this summary. PGW was compared with two separate groups of utilities. The larger group of 27 companies (including PGW) was used as a broad comparison of "industry standard" practices, and covered the utilities primarily in the eastern half of the U.S. Seven of the companies in the broader benchmark group were pulled out for a closer comparison to PGW. These seven gas distribution companies were selected by PGW as having systems most similar to PGW's system. The seven systems are all centered around a central inner city, and are thus considered to be the most-comparable benchmark that could be used. These companies tended to operate reasonable amounts of older, cast iron pipe and were predominantly located in the northeastern part of the U.S.

The statistics presented within this benchmarking study report are primarily publicly available and have been sourced from the "U.S. Department of Transportation's Annual Report for Gas Distribution System," covering the 10-year period ending in 2006.

The main points to emerge from this study are as follows:

1. Within the larger group of utilities, PGW has a much higher than average proportion of cast iron pipe. This will increase the overall risk from the system as breaks from cast iron pipe are one of the most common causes of incidents.
2. Within the smaller group of utilities, PGW has an average proportion of cast iron pipe. This smaller group contains 49% of all the cast iron in operation in the US, but only 5% of the population of all materials, showing that this group is close to PGW in terms of its material composition.
3. Within the larger group of utilities, PGW has the lowest percentage of polyethylene pipes. Polyethylene is considered to have the lowest risk of serious incidents due to its extreme resistance to joint leakage, fracture and corrosion.
4. Within the smaller group, PGW has the highest percentage of cast iron, the lowest percentage of polyethylene, and the lowest percentage of bare steel.

5. PGW's distribution of pipe by diameter is comparable with the smaller group, but PGW has much less small diameter (less than 2-inch) pipe in comparison with the larger group, since the majority of their system is operated at low pressure (6"wc) and PGW eliminated small diameter CI during the late 80's early 90's as part of its main replacement program.
6. PGW has one of the highest proportions of pre-1940 pipe within the larger group, but an average proportion when compared within the smaller group.
7. PGW has an average percentage of PE services within both the larger and smaller benchmark group.
8. PGW has one of the shortest average service line lengths within the larger group and the shortest within the smaller group. This is an important factor in the risk arising from main breaks and to a lesser extent for joint leaks, as gas will have shorter distance to migrate into nearby property.
9. When compared with other utilities, there is marked difference between the classification of leaks within PGW and elsewhere, in particular the high number of leaks classified as due to "natural forces," compared to other companies. PGW attributes 90% of their leaks to this cause, compared with only 14% for the larger group and 22% for the smaller group. This may be a real difference, or more likely, a difference of interpretation of the classifications.
10. In terms of unaccounted-for gas, PGW ranks as having one of the highest figures within the largest group and the highest within the smaller group, but previous studies have suggested that there may be a high level of unreliability associated with these figures.
11. Trends in joint and break leaks are not available via the DOT statistics, but Advantica carried out a separate, confidential survey, to determine figures from six companies (five from the smaller benchmark group and one from the larger group). The 10-year trend in cast iron breaks and joint leaks for PGW shows a reasonably level trend for breaks, suggesting that the current level of cast iron replacement is sufficient to stabilize the break rate. There is, however, a slight upward trend for joint leaks, suggesting that the replacement level should perhaps need adjusting upwards to reverse this trend or keep it level. It must be noted that weather also plays an important factor in the number of breaks per year that a utility experiences.
12. A comparison of joint leaks as a percentage of total leaks, from this anonymous group, has shown that PGW's percentage is average.
13. A comparison of incident rates over the period 1986 to 2004 has shown that the PGW rate was significantly higher than the average for all U.S. gas companies over this period, an average of just under 25 incidents per 100,000 miles of mains and services per year compared to a national average of around 7 per 100,000 miles per year. However, the general trend for PGW has shown a reduction in incidents in recent years.
14. The main cause of incidents within PGW has been recorded as "outside force." This is the same pattern as seen within the U.S. as a whole.
15. The largest source of incidents appears to be mains. This is seen for both PGW and the U.S. as a whole.
16. The vast majority of incidents within PGW occur on cast iron pipes, on 4 to 6-inch mains, on older pipes, within the winter months. This pattern is similar to the national situation.

Replacement policy

As well as examining PGW's current position in terms of operating statistics, Advantica has also examined PGW's position in relation to replacement levels, in particular those of cast iron. The main points of this examination are listed below.

1. In terms of replacing its cast iron population over the 10 year period ending in 2006, PGW rank in the lowest quartile within the larger group, having replaced a total 156.3 miles or approximately 8.8% of its' main from the starting point of 1,768 of the CI system compared to an average of 13%. For the smaller group however, it matches the average reduction. The ten (10) year average for replacement is 15.6 miles, the five year average is 20.2 miles and the most recent replacement level equates to just more than 18 miles per year.
2. PGW's replacement of cast iron over the period 2001 to 2006 has been approximately twice as high as in the years 1998 to 2000.
3. If PGW were to increase its replacement level to 24 miles per year, it would rank second highest in the smaller benchmark group. If it were to reduce replacement to 12 miles per year, it would rank second lowest.
4. If PGW continued to replace at its recent rate of 18 miles per year, using a random approach, its year of final replacement would be 2096. This compares with 2063 for the company with the best rate of replacement (24 miles) and 2291 for the company with the worst rate of replacement (12 miles).
5. Following discussion with PGW staff, regarding replacement techniques and the constraints imposed by working in an urban area, Advantica have suggested the following for reducing the costs of repairs and replacement of mains:
    - Revisit longer term contracts
    - Schedule larger replacement areas/projects
    - Discuss paving requirements with the City
6. As part of the survey conducted by Advantica, participants were asked for suggestions for replacement techniques which they would recommend for reducing costs. The details of these are contained within the main body of the report. Advantica has also provided PGW with a flowchart aid to selecting construction techniques.
7. Finally, the survey collected details of repair and replacement costs for each of the participants. PGW has a relatively low cost per repair of $1,660 per mains break repair, compared to an average of $3,300. PGW has an average replacement cost of $0.7 million per mile, comparing favorably to an overall average of $1.1.

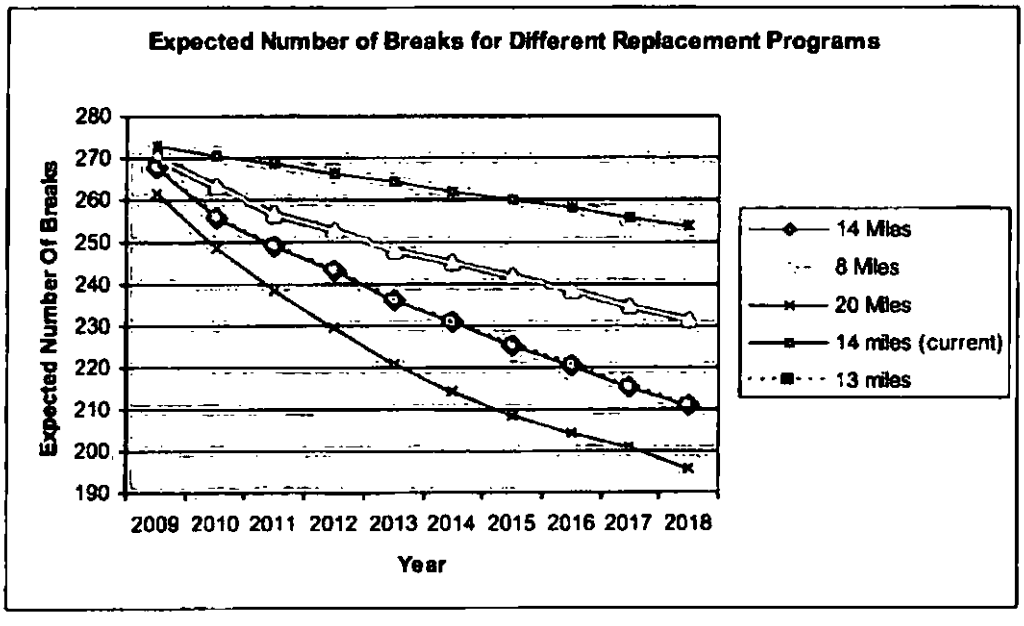
Alternative replacement scenarios using MRP

The previous two sections have examined the current status of PGW in terms of operating statistics and replacement policy. Advantica has also carried out some analysis to determine if the present policy can be improved by the application of MRP, Advantica's prioritization model. MRP has been populated with pipe details for PGW, namely pipe sizes, their geographical location, their associated leaks and information relating to service length. This has enabled

Advantica to generate a number of different replacement scenarios based upon different levels of risk-based replacement and their associated costs, to determine how effective they are at reducing breaks, avoiding breakage repair costs, and improving safety.

Replacement levels of 12 miles, 17 miles, 18 miles and 24 miles, using MRP, have been examined, together with 18 miles using PGW's current methodology. The results of running these scenarios are presented in the following graph, in terms of a reduction in expected breaks over a 10-year period by applying different annual rates of replacement and methodologies.

It is important to note that PGW's annual program is made up of prudent and enforced replacement. The prudent portion has historically been selected using PGW's current prioritization tool. The enforced has to be carried out due to city, state, federal and other utility projects outside the control of PGW. Traditionally, the enforced has accounted for around 4 miles per year. The scenarios which are presented within this report, using MRP, have removed 4 miles from the total to simulate the actual situation, thus the 18 mile scenario is actually 14 miles of cast iron, the 24 mile is actually 20 miles and so on. The output from MRP has been amended to produce a graphical output for breaks per year rather than leaks, as PGW has traditionally measured its replacement program against the trend in breaks not leaks. The following graph shows the results of applying MRP to a number of different scenarios, based upon different lengths of replacement.



As expected, the more pipe is replaced, the greater the reduction in breaks per year. The average breakage rate over the 10 year period 1997 to 2006 within PGW has been 370. MRP predicted a starting level of 275 for 2008. It is important to note that the output from MRP predicts the number of breaks associated with specific pipes. The average level of breaks of 370 is based upon all breaks, whether they are assigned to pipes or not. When PGW's historical data is examined

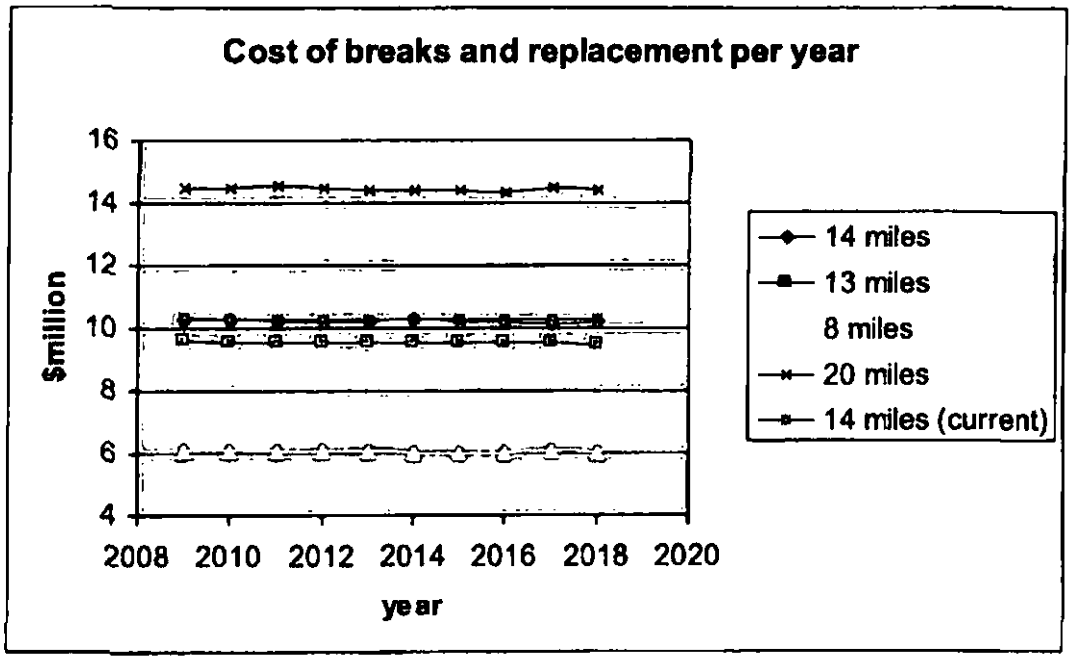
further to extract only those breaks associated with pipes, the average reduces to 254 – this is in comparison to a predicted average from MRP of 275.

The graph also shows that there is a distinct difference between 14 miles (18 miles total) using PGW's current policy versus 14 miles (18 miles total) using MRP. The level of predicted breaks for 13 or 14 miles is very similar, but the 14 mile scenario does reduce breaks slightly quicker than the 13 mile scenario. In terms of percentage reduction, the scenarios performances are summarized in the following table.

Scenario	Description	Breaks in year 0	Breaks in year 10	% reduction in length of cast iron	% reduction in breaks
A	18 miles of cast iron per year, random (14 miles prudent)	275	253	8%	8%
B	18 miles of cast iron per year (14 miles using MRP Risk)	275	209	8%	24%
C	17 miles of cast iron per year (13 miles using MRP risk)	275	211	7.5%	23%
D	12 miles of cast iron per year (8 miles using MRP Risk)	275	231	5%	16%
E	24 miles of cast iron per year (20 miles using MRP risk)	275	196	11%	29%

The previous table shows that the application of MRP is effective for all scenarios, in reducing cast iron breaks, and hence incidents; each one removing proportionally more breaks than the corresponding length replaced, and all of them more effective than the current policy. The table also shows that any move away from the 14 mile (18 mile total) program will reduce the effectiveness of reducing breaks and hence incidents.

The cost of replacement and repair has also been considered. An increase in replacement will increase replacement costs but reduce future breakage repair costs. The following graph summarizes the total cost of each scenario, in terms of replacement and breakage repair costs. The 14 mile (18 mile total) current and MRP scenarios have similar levels of costs, as the cost of replacement is the same in both cases, and is much greater than the cost of breakage repairs. However, as can be seen in the previous graph, the reduction in future breaks is much greater if MRP is used to prioritize the 14 miles.

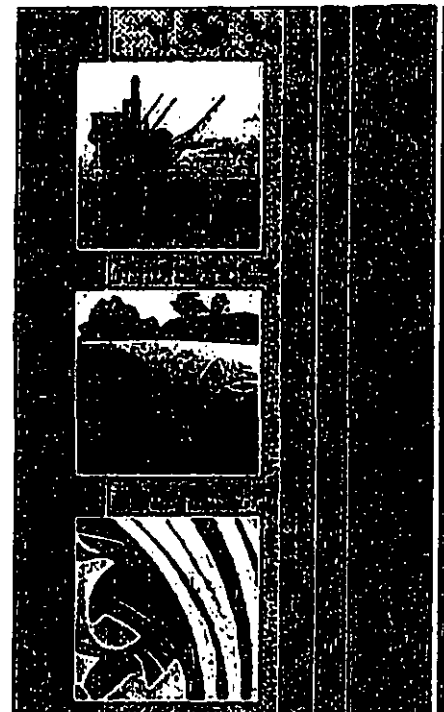


Conclusions and Recommendations

The results of the analysis carried out by Advantica have shown that PGW operates a distribution system which is typical of one operating in a central inner city area, where the mains population is very well established and there are constraints on the amount of replacement possible because of the density of other services and property.

Because of this particular type of system, PGW has a higher than average level of leaks and incidents, older than average pipes, and a lower than average polyethylene population. It is therefore imperative that any replacement policy is as effective as possible at identifying the pipe segments that present the greatest likelihood of leaks and incidents, and replacing them as early as possible in the program.

The application of MRP to the population of pipes within PGW has shown that PGW could continue to operate a policy of 18 miles per year, of prudent and enforced, but significantly reduce the level of future breaks, simply by identifying a different population of those 18 miles. It has been assumed that 4 miles of the 18 is still outside the control of PGW as it is enforced replacement, but the remaining 14 miles could be identified using the MRP risk model. This would identify those cast iron mains with the highest probability of breaking and causing an incident. This program will have a similar cost to the current 18-mile policy, but is estimated to produce significant savings in terms of breaks avoided over the subsequent 10-year period. An 18-mile program, directed by MRP over the next 10 years reduces the cast iron population by around 8% but the estimated reduction in breaks over the same period is 24%.



ADVANTICA

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STONERSOFTWARE

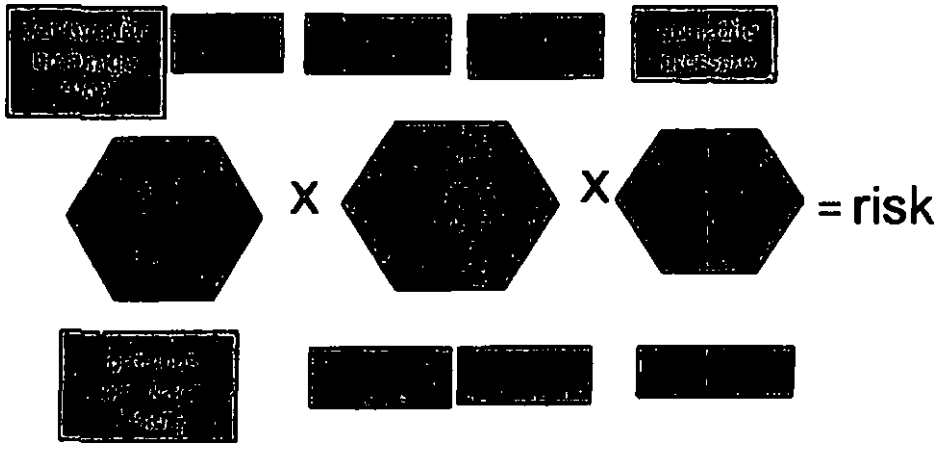
Benchmarking Analysis, Risk Analysis and Model, Replacement Analysis and Computerized Main Prioritization and Ranking Program

Philadelphia Gas Works
Final Report
June 2, 2008

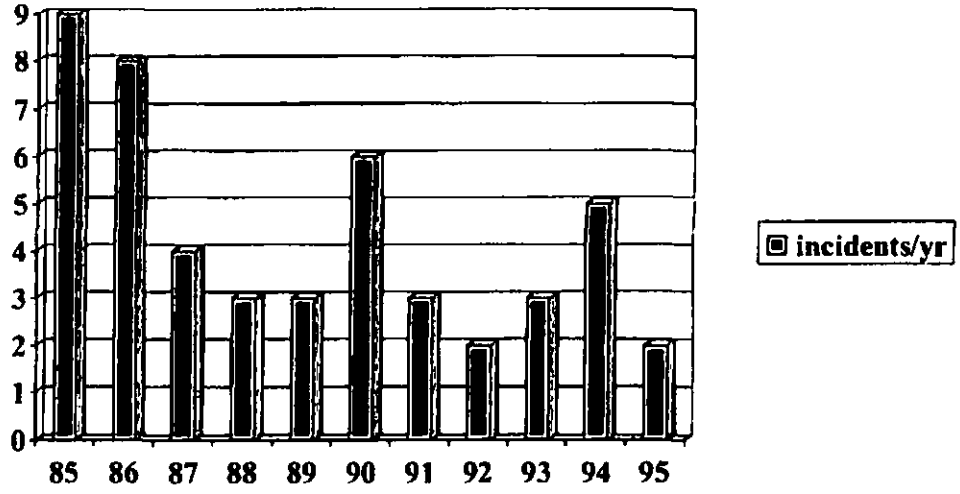
Enhancing Safety and Performance

Dynamic Risk Model

The dynamic risk model developed for PGW is based on the risk model developed for the UK gas industry. The original model, developed in the 1980s, was called the Points Scheme. It was based on modeling a three-stage process: gas leaking from a pipe segment, the gas migrating underground from the pipe into nearby property, and the gas subsequently building up to a flammable mixture and igniting, causing damage to the property and possible injury or fatality to any occupants. At each stage of the process, different elements were thought to act upon the likelihood of each stage occurring.



The Points Scheme was essentially a ranking program, and the Points Score for each pipe segment was used to compare one pipe against another in terms of its priority for replacement. The weightings within the model for each element were largely intuitive rather than based upon analysis of historical data. The model was used between 1985 and 1995 and recommended the annual replacement of approximately 1% of the cast iron population in use at the time, around 75,000 miles, at an approximate annual cost of $240 million. The 1% was selected to reach a target of replacing all cast iron above a Points threshold of 1200 points by 1995. This was deemed to be an acceptable level to reduce incidents to a level of around three per year and keep it stable over the coming years. Although the Points model was based on ranks rather than an actual measure of risk, there was a steady decrease in explosion incidents over the period, suggesting that the model had been reasonably successful at targeting pipes presenting the greatest risk.



In 1995, the development of a refined model began, based on analysis of actual historical failure. It was based on data from one million cast and ductile iron pipe segments, covering 20 years of failure data and 10 years of gas in building and incident data. The model kept the three-stage process but the weightings within the model and the relationship between the individual elements were generated by regression analysis performed on the data. The result was the Risk Model, now incorporated into MRP (Mains Replacement Prioritization), and the output from the model was a risk score for each pipe segment in terms of incidents per length per year. This allowed, for the first time, the reduction in risk to be numerically linked to the length (and hence cost) of replacement, so that replacement plans could be presented to the UK gas regulators, Ofgem (The Office of Gas and Electricity Markets), and the HSE (Health and Safety Executive). The model was finalized in 1999 and presented to HSE, who then endorsed it, and it was implemented across the UK in 2000. In 2002, following an inquiry into a serious incident in 1999, the UK gas industry was subject to an enforcement notice from HSE, forcing them to replace all cast and ductile iron mains within 100 feet of property in the following 30 years. The Risk Model is used by all network gas companies in the UK to prioritize that replacement.

The model is now in use within other gas utilities around the world and has recently been implemented within PGW. In order to install a version which is aligned with PGW's distribution system, the models within MRP have to be calibrated. This involves calculating the overall level of failures with PGW, and using this information to scale the models accordingly. This is because the MRP base models are based on data from the UK, and each utility will have a failure rate that is less or greater than this rate depending on such factors as previous replacement policies, or geographical location (affecting weather conditions), all of which will affect the overall level of leakage repairs.

MRP contains two models: Condition and Risk. Risk models the likelihood of a leak leading to a serious incident, (mains break) as described above, whereas Condition measures the first stage of the process only, i.e. the likelihood of a leakage repair.

The Condition model requires data for each pipe segment on material, age, length, previous leaks, and Background Failure Zone, or BFZ. These are "hotspots" of failure activity and are generated by examining all pipes, their locations, and their associated leaks. Previous analysis has shown a very strong link between the likelihood of a pipe leaking and the leakage behavior of other pipes in its vicinity. This is especially important when trying to determine how a pipe will behave when it has not yet experienced any leakage repairs. This normally accounts for over 90% of the system; therefore, any policy that relies on prioritizing replacement based on previous leaks alone will only be able to assess around 10% of the system. The introduction of BFZs means that all pipes will have factors associated with them that will discriminate them from their neighbors in terms of Condition or risk score.

All data required to generate Condition scores was loaded into MRP for PGW (taken from the Underground Facilities System (UFS) or Detail Main Maps (DMM)), and BFZs and Condition Scores were calculated. The predominant material in PGW is cast iron, and the predominant failure mode is joint leaks. The following picture shows the distribution of Background Joint Zones (BJZs) for the PGW area as generated by MRP. Areas in red are high zones, areas in green are medium, and areas in blue are low. Pipes lying within a high BJZ are much more likely to experience a joint leak than identical pipes lying within a low BJZ. The same theory is applicable to Background Breakage Zones and Background Corrosion Zones.

MRP will also calculate Risk scores for each pipe. The data required all relate to the pipe and its environment and include the following:

- Proximity of the pipe to nearby property
- The presence of basements in nearby property
- The type of ground surface between the pipe and nearby property (i.e. paved or open)
- The diameter of the pipe
- Its operating pressure.

For the implementation within PGW, the proximity has been estimated by the use of service length. Most properties have been assumed to have basements, and paved ground between the main and nearby property. The diameter and operating pressure are already known.

12-Inch 10-35 psig Cast Iron Mains Benchmark Study

November 29, 2012

For: Jeff Meyers
Philadelphia Gas Works

GL Noble Denton

GL

I) Executive Summary

Background

GL Noble Denton has been engaged by the Philadelphia Gas Works (PGW) to conduct a benchmark study on the replacement of large diameter cast iron mains. The study benchmarks nine distribution utilities, including PGW, to determine replacement strategies for 12-inch diameter cast iron mains. As part of the benchmark study, PGW has requested that GL Noble Denton perform a replacement analysis on the 12-inch cast iron mains to determine the most efficient approach to replacing these pipes, using the MRP software, while managing the risk of the system.

Benchmarking Study

The benchmarking study for PGW was extensive and the full results are contained within the main body of the report, but the main points arising from this exercise are detailed within this summary. PGW was compared with eight distribution utilities. The eight systems are all centered around a central inner city, and are thus considered to be the most-comparable benchmark that could be used. These companies tended to operate large amounts of older, cast iron pipe and were predominantly located in the northeastern part of the U.S.

The statistics presented within this benchmarking study report are primarily publicly available and have been sourced from the "U.S. Department of Transportation's Annual Report for Gas Distribution System," covering the 7-year period ending in 2011.

The main points to emerge from this study are as follows:

1. PGW has a much higher than average amount of cast iron pipe (50.9% of its mains) compared to the other benchmark utilities. This tends to increase the overall risk from the system as breaks from cast iron pipe are one of the most common causes of incidents. (p. 14 – figure 4)
2. The nine distribution companies together contain 47.4% of all 12-inch cast iron mains (of all pressures) in the US and 39.8% of all cast iron mains in the US, even though they only account for 4.5% of the total mileage of mains in the U.S. These statistics verify the selection of the nine utilities as a very comparable benchmarking group. (p. 12 – figure 2)
3. PGW has a greater than average 12-inch cast iron (of all pressures) inventory (4.2%) as a percentage of all mains in PGW's system, compared to the other benchmark utilities. (p. 14 – figure 5)
4. PGW has made remarkable progress in lowering their number of reportable incidents over the 22-year period since 1980. From a high of 12 reportable incidents on PGW's system in 1982, there have only been two incidents on PGW's system in the last 6 years. Considering only the incidents that have involved cast iron, PGW has experienced only three of these in the last 10 years. (p. 31 – figure 20)

5. PGW had a below average number of incidents (1) as compared with the other benchmark companies, between the years 2010 and 2012, for all causes, sizes, and piping materials. (p. 34 – figure 23)
6. The majority of PGW's incidents from all causes occur in the January to February months. Incidents involving just cast iron mains also peak during this period, especially in January. This appears to agree with PGW's assessment of the major cause of incidents on their system – frost upheaval of the ground. (p 37 – figure 27)
7. PGW has the lowest leak rate of the six survey respondents for 12-inch 10-35 psig cast iron. (p.29 – figure 18)
8. PGW has the mean break rate of the survey respondents for 12-inch 10-35 psig cast iron. (p.29 – figure 19)

Replacement policy

As well as examining PGW's current position in terms of operating statistics, GL Noble Denton has also examined PGW's position in relation to replacement levels of 12-inch 10-35 psig cast iron. The main points of this examination are listed below.

1. According to responses from six surveyed companies, PGW replaces about an average amount of 12-inch 10-35 psig cast iron per year. The average includes two survey respondents that have small amounts of 12-inch cast iron in their system but have not replaced any of it. (p. 28-Figure 17)
2. The utility with the highest replacement mileage of the six surveyed companies replaces 4 miles of 12-inch 10-35 psig cast iron per year, or 2.8% of their 12-inch 10 psig & higher pressure cast iron inventory. (p. 28-Figure 17)
3. Two companies have not replaced any of their 12-inch 10-35 psig pressure cast iron. PGW replaced 1.01 miles per year, or 4.39% of their 12-inch 10-35 psig cast iron inventory. A replacement rate of 1 mile per year would be equivalent to a rate of 4.3%, while a replacement of 2 miles per year would equate to a rate of 8.7% per year. (p. 28-Figure 17)
4. According to the replacement analysis carried out by GL Noble Denton, replacing 2 miles of 10-35 psig 12-inch cast iron per year is the proper amount for reducing risk to an acceptable level. (p. 5 - see table below on next page)

Scenario	Description	*Cost of* Replacement (MM$) over 10 years	% reduction in length of elevated pressure 12-Inch cast iron	% reduction in incidents after 10 years
A	1 mile per year	38.55	47.90	96.07
B	2 miles per year	75.19	93.42	99.60
C	3 miles per year	80.48	100	100
D	5 miles per year	80.48	100	100

Conclusions and Recommendations

The results of the analysis carried out by GL Noble Denton have shown that PGW operates a distribution system which is typical of one operating in a central inner city area, where the mains population is very well established and there are constraints on the amount of replacement possible because of the density of other services and property.

Due to the recent instances of accidents on large diameter cast iron mains in the U.S., and the overall reduction of risk for the distribution system exhibited by PGW's marked reduction in all reportable incidents, GL Noble Denton concludes that 2 miles of 12 inch high pressure cast iron replacement per year provides the proper balance of risk reduction for a utility operating in a congested area.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the participants listed below in accordance with the requirements of § 1.54 (relating to service by a participant).

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Date: December 3, 2012

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DIRECT TESTIMONY OF

KENNETH S. DYBALSKI

ON BEHALF OF
PHILADELPHIA GAS WORKS

Docket No. P-2015-2501500

Revisions To PGW Distribution System Improvement Charge

September 1, 2015

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND POSITION WITH THE COMPANY.

A. My name is Kenneth S. Dybalski. My position is Director - Gas Planning & Rates, at Philadelphia Gas Works.

Q. HOW LONG HAVE YOU HELD THIS POSITION?

A. I have been the Director - Gas Planning & Rates since 2006 and prior to that I was the Manager of Gas Planning from 2001 to 2006.

Q. WHAT ARE YOUR VARIOUS JOB RESPONSIBILITIES?

A. In my present position, I am responsible for developing and coordinating short and long term planning of gas demand, gas supply, raw material expense and revenue; overseeing the preparation of sales, sendout, revenue and fuel expense projections; developing peak day/hour load projections; overseeing the development of the various filings before the Pennsylvania Public Utility Commission ("Commission or PUC") and Philadelphia Gas Commission, including the quarterly and annual Gas Cost Rate ("GCR") filings; preparing the Integrated Resource Planning Report; and providing supporting documentation for gas costs related to PGW's Operating Budget before the Philadelphia Gas Commission.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND.

A. I hold a BS and an MBA from Temple University in Philadelphia, Pennsylvania.

Q. HAVE YOU EVER PROVIDED TESTIMONY BEFORE THIS COMMISSION?

A. Yes. I submitted testimony on behalf of PGW in several proceedings, including the Petition of Philadelphia Gas Works for Approval of a Distribution System Improvement Charge (Docket No. P-2012-2337737).

Q. WHAT TOPIC ARE YOU ADDRESSING IN YOUR DIRECT TESTIMONY?

A. My testimony addresses the proposed revisions to the Distribution System Improvement Charge ("DSIC") to reflect an increase from 5% to 7.5% (exclusive of reconcilation), as well as the rate impact of the proposed increase. I will also discuss: (i) PGW's proposal to charge a levelized DSIC; (ii) the mechanics of PGW's proposed reconciliation mechanism and the proposal to establish a 10% total cap for the DSIC including reconcilation; (iii) the proposed modifications to PGW's tariff to accommodate these proposals; and (iv) PGW's proposal to waive the requirement to charge interest on overcollections.

II. BACKGROUND

Q. PLEASE DESCRIBE PGW'S CURRENT DSIC.

A. The DSIC has been an integral tool in enabling PGW to replace at risk infrastructure by removing primarily cast iron main from inventory. PGW's DSIC was approved on May 9, 2013.[1] PGW's DSIC compliance tariff, Supplement No. 62 to Gas Service Tariff – Pa P.U.C. No. 2, went into effect June 1, 2013.[2]

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1 *Petition of Philadelphia Gas Works for Approval of a Distribution System Improvement Charge*, PUC Docket No. P-2012-2337737, Opinion and Order entered on May 9, 2013 ("Final DSIC Order").

2 Final DSIC Order; *Petition of Philadelphia Gas Works for Approval of a Distribution System Improvement Charge*, PUC Docket No. P-2012-2337737, Secretarial Letter dated June 4, 2013;

PGW's Commission-approved DSIC tariff[3] includes, among other things, a 5% cap on the total amount of revenue that may be billed through PGW's DSIC.[4] PGW's DSIC bills 100% of the cost of the facilities to be replaced on a "pay-as-you-go" basis.[5] The Commission's Order approving PGW's DSIC also directed that its DSIC be calculated quarterly, and reflect only the cost of facilities which were placed into service in the previous quarter.[6]

Q. WHAT IS THE PURPOSE OF THE DSIC?

A. Generally, the purpose of the DSIC is to allow utilities to recover costs associated with incremental repairs, improvements and replacement of eligible property, which costs have not been reflected in the utility's rates or rate base, or will not be reflected, until those costs may be included in a future rate case, in order to ensure and maintain adequate, efficient, safe, reliable and reasonable service. PGW uses its DSIC in this way to recover a portion of its accelerated at risk main replacement program.

Q. ARE THERE STATUTORY LIMITATIONS ON THE DSIC?

A. Yes, certain statutory limitations are included in Act 11, the Act that authorized the DSIC mechanism. Specifically, absent a waiver, the DSIC may not exceed

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Petition of Philadelphia Gas Works for Approval of a Distribution System Improvement Charge, PUC Docket No. P-2012-2337737, Secretarial Letter dated June 10, 2013.

3 PGW Gas Service Tariff, Pa. PUC No. 2, Eighth Revised Page 151 to Second Revised Page 153.

4 PGW Gas Service Tariff, Pa. PUC No. 2, Eighth Revised Page 151 and Fourth Revised Page 152.

5 *Petition of Philadelphia Gas Works for Approval of its Long-Term Infrastructure Improvement Plan*, PUC Docket No. P-2012-2337737, Opinion and Order entered on April 4, 2013 at 13-14 ("LTIIP DSIC Order"). In this Order, the PUC tentatively approved PGW's DSIC but directed certain changes in the proposed tariff, which were subsequently approved.

6 LTIIP DSIC Order at 36; Final DSIC Order at 4-6.

5% of the amount billed to customers under the applicable distribution rates of the natural gas distribution utility or city natural gas distribution operation.[7] Additionally, Act 11 provides that the DSIC will: (i) change each quarter;[8] (ii) be calculated to recover the fixed cost of eligible property that has been placed in service during the prior quarter;[9] and (iii) will be reset to zero as of the effective date of new base rates that provide for prospective recovery in base rates of the annual costs previously recovered under the DSIC.[10]

PGW's DSIC contains all these consumer protections, although, because PGW uses a "pay as you go" method of billing for DSIC costs, its DSIC will not be reset to zero on the effective date of a new base rate case because its DSIC expenditures will be recovered in the year in which they are included in the DSIC (not considering the reconciliation of prior year costs, which will be recovered in the separate reconciliation mechanism and not in base rates).

III. WAIVER OF 5% LIMITATION

Q. PLEASE DESCRIBE PGW'S PROPOSAL FOR A NEW MAXIMUM ALLOWABLE PERCENTAGE LIMITATION.

A. PGW is requesting that the Commission (i) waive the current DSIC cap of 5% of billed distribution revenues; and (ii) approve a 2½% increase in the maximum allowed DSIC from 5% to 7.5% (not including reconciliation) for service rendered on or after January 1, 2016.

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7 66 Pa. C.S. § 1358(a)(1).

8 *See* 66 Pa. C.S. §§ 1353(b)(i)(iv), 1354(3), 1357(a)(2), 1357(b)(3) (relating to quarterly updates of the DSIC). *See also* footnote 9, *infra*.

9 66 Pa. C.S. §§ 1357(a)(1)(ii), (a)(2), (b)(1).

10 66 Pa. C.S. § 1358(b)(1).

This proposal is consistent with the Staff Report of the PUC issued (on April 21, 2015) entitled: "*Staff Report: Inquiry into Philadelphia Gas Works' Pipeline Replacement Program* (hereinafter "PUC Staff Report"). The PUC Staff Report's suggested principal means of achieving an acceleration of the pace of replacement of at risk mains was to increase PGW's DSIC above the current 5% cap.[11]

Q. HOW WILL PGW CALCULATE THE DSIC SURCHARGE?

A. A DSIC capped at 7.5% (exclusive of reconciliation) would permit PGW to spend approximately $33 million annually to expedite its existing main replacement program, or an increase of approximately $11 million over the maximum currently permitted under the 5% cap.

Q. HOW WILL DSIC BE APPLIED TO CUSTOMER BILLS?

A. PGW will bill its customers for the DSIC on a "bills rendered" basis, and the surcharge will be expressed as a percentage carried to two (2) decimal places and will be applied to the total amount billed to each customer for distribution services.

The DSIC will be applied equally to all customer classes as a percentage and will be at or below the 7.5% cap for each class, exclusive of reconciliation. The percentage charge will produce, over 12 months, the $33 million that PGW projects to spend on its accelerated main replacement program in 2016.

Q. PLEASE DESCRIBE THE RATE IMPACTS UPON CUSTOMERS.

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[11] PUC Staff Report at 5, 35-42.

A. The proposed further acceleration would have the following incremental impact on the average customer bills:

Incremental Impact – Average Residential Heating Customer Bill	
DISC	7.50%
Customer Impact ($) - Year	$19.80
Customer Impact ($) - Month	$1.65
Customer Impact (%)	1.7%

Based on 83 MCF per year and June 2015 rates.

Incremental Impact – Average Commercial Heating Customer Bill	
DISC	7.50%
Customer Impact ($) - Year	$63.63
Customer Impact ($) - Month	$5.30
Customer Impact (%)	1.5%

Based on 363 MCF per year and June 2015 rates.

Incremental Impact – Average Industrial Heating Customer Bill	
DISC	7.50%
Customer Impact ($) - Year	$163.99
Customer Impact ($) - Month	$13.67
Customer Impact (%)	1.5%

Based on 943 MCF per year and June 2015 rates.

IV. LEVELIZATION AND ANNUALIZATION

Q. HOW WILL THE DSIC CHARGE BE APPLIED TO CUSTOMERS' BILLS?

A. PGW is proposing that its DSIC be levelized and annualized.

Q. PLEASE EXPLAIN WHY PGW IS PROPOSING TO LEVELIZE AND ANNUALIZE ITS DSIC ELIGIBLE COSTS.

A. PGW's experience with the quarterly adjustments of the DSIC appears to have been quite different from the experience of investor-owned utilities. I would note that, for investor-owned utilities, the DSIC increases gradually and progressively

each quarter.[12] The DSIC for investor-owned utilities, and consistent with the "used and useful" rule that applies to their ratemaking, is calculated to recover the fixed cost of eligible property that has been placed in service during the prior quarter.[13]

That has not been PGW's experience. PGW's current, non-levelized DSIC structure does not result in a steadily increasing revenue stream. PGW's current DSIC structure has resulted, and will continue to result in, significant DSIC fluctuations – which vary throughout the year.[14] PGW's DSIC is further impacted by seasonal usage variations. PGW's current DSIC structure has further resulted, and, if it is remains unlevelized, will continue to result in, PGW's lowest DSIC being applied during the highest sales volume quarter. This leads to PGW billing less annual DSIC revenue than intended in some months and, in other months, being unable to bill for the total value of the amount it has placed into service. In some quarters PGW's billings through the DSIC have been lower than 5% of PGW's distribution revenues, and in others, its total expenditures amounted to as much as 7% of distribution revenues (although it nonetheless only billed 5%). Not only does this result in a DSIC that is difficult for customers to understand and for PGW to administer, but also makes it very likely that PGW will not be able to timely bill all funds available at the cap level, whether 5% or

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12 PUC Staff Report at 35, Table 25.

13 *See* footnotes 8 and 9, *supra*.

14 PUC Staff Report at 36, Table 26.

7.5%. The history of PGW's DSIC revenue billing, as a percentage of distribution revenues, is as follows:

PGW DSIC – HISTORICAL BILLINGS AS % OF DISTRIBUTION REVENUE	
7/1/2015	1.64%
4/1/2015	2.09%
1/12015	2.24%
10/1/2014	5.00%
7/1/2014	5.00%
4/1/2014	2.60%
1/1/2014	4.34%
10/1/2013	4.14%
7/1/2013	3.02%

The PUC Staff Report recognized this problem and suggested that PGW seek to levelize and annualize its DSIC-eligible costs.[15] Staff noted that, ideally, the DSIC should remain relatively level throughout the year in order to pass costs equally to all customers, regardless of seasonal usage patterns. For this reason, Staff recommended that PGW seek a waiver of the applicable statutory provision so that it could seek to levelize and annualize its DSIC-eligible costs.

Q. PLEASE DESCRIBE PGW'S PROPOSAL.

A. PGW is proposing to set the DSIC on an annualized basis to recover the eligible costs incurred as part of the accelerated replacement program of $33 million, using a levelized charge each month, instead of being reimbursed based on a calculation of actual costs for eligible property placed in service in the previous quarter. I would note that PGW already utilizes an annualization/levelization

[15] PUC Staff Report at 5-6, 42-44.

approach for recovery of its natural gas costs through its Gas Cost Rate.

As I stated earlier, in calendar year 2016, PGW's DSIC eligible accelerated replacement program will be $33 million each year. The amount billed to PGW customers for distribution service, as determined on an annualized basis, is $450 million. Five percent (5%) of this annualized distribution revenue is approximately $22.5 million. Seven and one-half percent (7.5%) of this annualized distribution revenue is approximately $33.75 million. Thus, PGW's proposed annual spending of $33 million in 2016 is within the proposed 7.5% DSIC cap, exclusive of reconciliation.

Q. WHAT IS THE JUSTIFICATION FOR WAIVING THE PROVISION OF ACT 11 LIMITING RECOVERY BY THE AMOUNT OF FACILITIES INSTALLED IN THE PRIOR QUARTER?

A. The waiver is justified on the basis of the specific regulatory requirements imposed on PGW by the General Assembly in Section 2212 of the Public Utility Code. In Section (2212(e)), a cash flow rate making method is required to be used for PGW. PGW's cash flow ratemaking methodology does not limit PGW revenue requirement to a return on used and useful property and instead is based on establishing adequate cash flow levels, among other things. Levelizing will help to ensure that the DSIC billing process will not create cash flow issues for PGW. Therefore, permitting a levelized DSIC is consistent with the guidance provided by the General Assembly for applying this waiver authorization.

Q. WHEN WOULD THE NEW 7.5% DSIC CAP TAKE EFFECT?

A. The effective date of the proposed tariff is January 1, 2016, subject to Commission approval. The DSIC (up to 7.5%, exclusive of reconciliation) will be

set annually in the January 1 filing and will be based on the projected annual recoverable DSIC costs divided by projected annual non-fuel revenues.

Q. HOW WILL PGW CALCULATE THE QUARTERLY AMOUNT?

A. Under the tariff, PGW will calculate the DSIC surcharge using the formula DSIC = (DSI + e) / PAR, where DSI represents projected recoverable yearly costs, "e" stands for the amount calculated under the annual reconciliation feature or Commission audit, and PAR is the projected annual revenue for distribution services for the year during which the charge will be collected ("non-gas" revenues).

Q. DOES PGW PROPOSE TO MAKE ANY QUARTERLY ADJUSTMENTS TO THE DSIC CHARGE?

A. Yes. The annual DSIC (up to 7.5%, exclusive of reconciliation) will remain in place for the period from January through December. In order to mitigate a material over or under collection:

- PGW may make quarterly adjustments to the annualized DSIC for the difference between projected and actual billed amounts.
- PGW may make quarterly adjustments to account for changes to the construction budget during the year for the accelerated replacement program.
- These proposed adjustments will not increase the DSIC above 7.5%, exclusive of reconciliation.

Q. PLEASE DESCRIBE THE BENEFITS OF LEVELIZING AND ANNUALIZING THE DSIC?

A. As the PUC Staff Report stated, levelizing and annualizing PGW's DSIC structure will:

– Improve rate stability and create a more predictable cash flow for PGW, even with seasonal usage variations.

– Compared to its experience to date, levelization and annualization should facilitate the required amount of DSIC revenue for the amount of DSIC-eligible capital expenditures.

– Will enable PGW to reduce the replacement timelines and will further achieve the intent of not only PGW's approved LTIIP but also Act 11 itself.

I agree. In addition, levelization permits PGW to bill customers for main replacement in a more timely manner. PGW believes that levelization will result in smaller under collections which otherwise would continually have to be recovered from customers over time.

V. ANNUAL RECONCILATION

Q. HOW WILL THE UNDER COLLECTION MECHANISM WORK?

A. The recovery of over or under collections for PGW shall continue to occur based upon the operation of an automatic adjustment clause. Specifically, PGW requests that it be permitted to modify its DSIC tariff so that if an under collection of the authorized billings under the 7.5% cap occurs, PGW will be permitted (as part of the annual reconciliation process in the subsequent year) to implement a DSIC higher than 7.5%, so as to permit PGW to adjust the DSIC for said undercollections. As a consumer protection against an unanticipated total charge, PGW is proposing that the total maximum allowable DSIC (both the base charge and the reconciliation) shall not exceed 10% of distribution revenues. This proposal will not impact the rules for the annual reconciliation audit or the treatment of over collections.

Raising the DSIC above 7.5% to account for reconcilation is reasonable to permit the recovery of undercollections. If the DSIC cap was not structured in this way (i.e., not including reconciliation) PGW could be forced with having to reduce its annual billings for main replacement to insure that the total DSIC charge, net of reconciliation stayed under the 7.5% cap. I would note that the current "e" factor to recover an under collection is de minimus – .30%.

Q. HOW WILL THE COMMISSION BE ASSURED THAT PGW'S TOTAL DSIC BILLINGS WILL BE REASONABLE NOTWITHSTANDING THE TOTAL 10% CAP?

A.. There are adequate checks in place to assure that PGW's total DSIC billing levels will be reasonable. PGW's infrastructure expenditures are reviewed and approved by the City, the Philadelphia Gas Commission and Philadelphia City Council in the form of its capital budget. Moreover, in addition to PUC review of PGW's five year LTIIP, PGW is required, in its Asset Optimization Plan annually to report to the PUC the nature and amount of its DSIC expenditures for the prior year, as well as the amount it expects to incur in the future. Finally, PGW's proposed 10% total cap will provide additional protection to customers that the total charge for DSIC will never exceed a specific maximum

Q. PLEASE EXPLAIN THE MECHANICS OF THE ANNUAL RECONCILIATION?

A. Any under or over collection from the previous year will be calculated in an annual reconciliation based on actual billed DSIC revenues and DSIC recoverable costs during each month of the calendar year. At present, the annual reconciliation of the DSIC results in a lag in which recoverable costs for the months of September to December are not included in the current year annual

reconciliation. Note that in the first year, the 'annual' reconciliation will have 16 months of recoverable costs due to this lag. For any under collection, the DSIC may be increased by an additional 2.5% (up to 10%) in order to recover the under collection. Any under or over collection will be reconciled and filed by January 31 of each year and will be billed or credited from April 1 to March 31 each year.

PGW will provide quarterly filings (on the calendar quarters) with the projected recoverable costs for the year plus any under or over collection amount from the annual reconciliation. These total projected recoverable annual costs will be divided by the projected annual revenues in the January 1 filing to determine the DSIC.

VI. TARIFF REVISIONS

Q. HAVE YOU PREPARED A PROPOSED TARIFF SUPPLEMENT SETTING FORTH CHANGES IN PGW'S CURRENTLY APPROVED DSIC SUPPLEMENT?

A. Yes. The Tariff Supplement, Supplement No. 85 to PA PUC Tariff No. 2 is attached as Attachment A to PGW's Petition. This tariff supplement makes the changes in the existing DSIC tariff to implement the increased cap and to utilize a levelized DSIC collection. As part of the approval of PGW's petition the PUC will be asked to authorize PGW to file this tariff supplement (as modified by the Commission order) on one day's notice, for service rendered on or after January 1, 2016. I would note that the DSIC rate that appears in Supplement No. 85 reflects a DSIC billed at 7.34% plus an "e" factor of .30% to reflect the collection of an existing under collection.

VII WAIVER OF INTEREST PROVISION

Q. IS PGW PROPOSING ANY OTHER CHANGES TO ITS EXISTING DSIC TARIFF?

A. PGW is also proposing that the Commission utilize its authority in section 2212(c) of the Public Utility Code to waive Act 11's requirement to pay interest at the residential mortgage rate on overcollections.

Q. WHAT IS THE JUSTIFICATION FOR THE PROPOSAL TO WAIVE THE INTEREST REQUIREMENT?

A. Waiving interest on overcollections is again, consistent with the regulatory scheme required by Section 2212. Any interest remitted will reduce PGW's cash flow, which will, in turn, increase its cash deficiency in its next base rate proceeding. Moreover, if levelization and annualization of PGW's DSIC is not approved, when interest is calculated on an over collection, PGW will be paying interest in the winter when DSIC revenues (sales) are the highest and recoverable costs are generally the lowest. This will result in rather large interest costs on an over collection as the winter months (Jan-Mar) weighting in the interest calculation is the highest number of months.

Q. ARE THERE CUSTOMER PROTECTIONS BUILT INTO PGW'S PROPOSED DSIC TARIFF?

A. As noted, PGW proposes that the total maximum DSIC, including reconcilation, may not be higher than 10% of its distribution revenues. If PGW determines to further accelerate its main replacement financed through DSIC it will file another petition to do so.

Q. HAS PGW PROVIDED ANY NOTICE OF THIS FILING TO CUSTOMERS?

A. Yes. PGW has provided a Notice to all of its firm customers. The Notice began to appear in the customer bills for the September billing cycle and is attached to PGW's DSIC Petition.

In addition, PGW has served copies of this Petition on the main parties that participated in PGW's initial DSIC filing.

VI. CONCLUSION

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

VERIFICATION

I, Kenneth S. Dybalski, hereby state that: (1) I am the Director - Gas Planning & Rates for Philadelphia Gas Works; (2) the facts above set forth in the foregoing document are true and correct (or are true and correct to the best of my knowledge, information and belief); and (3) that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

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Kenneth S. Dybalski

PGW St. 2-R

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

REBUTTAL TESTIMONY OF

KENNETH S. DYBALSKI

ON BEHALF OF
PHILADELPHIA GAS WORKS

Docket No. P-2015-2501500

Revisions To PGW Distribution System Improvement Charge

October 29, 2015

I. INTRODUCTION

Q. ARE YOU THE SAME KENNETH S. DYBALSKI WHO PREFILED DIRECT TESTIMONY ON BEHALF OF PHILADELPHIA GAS WORKS (PGW OR COMPANY) IN THIS PROCEEDING?

A. Yes. My direct testimony addressed the proposed revisions to the Distribution System Improvement Charge ("DSIC") to reflect an increase from 5% to 7.5% (exclusive of reconciliation), as well as the rate impact of the proposed increase. I also discussed: (i) PGW's proposal to charge a levelized DSIC; (ii) the mechanics of PGW's proposed reconciliation mechanism and the proposal to establish a 10% total cap for the DSIC including reconciliation; (iii) the proposed modifications to PGW's tariff to accommodate these proposals; and (iv) PGW's proposal to waive the requirement to charge interest on overcollections.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. My rebuttal testimony responds to the prefiled direct testimony of the following witnesses, who prefiled direct testimony on October 19, 2015:

- Bureau of Investigation and Enforcement (I&E) witnesses: Rachel Maurer (I&E Statement No. 1)
- Office of Consumer Advocate (OCA) witness, Ashley E. Everette (OCA Statement No. 1);
- Office of Small Business Advocate (OSBA) witness: Robert D. Knecht (OSBA Statement No. 1);
- I&E witnesses: Cooper Smith and Horensky (I&E Statements No. 2 and 3).

Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.

A. I will address the issues raised regarding PGW's request for waiver on the payment of interest on overcollection, the response of parties opposing PGW's request to increase the DSIC cap, the response of parties to PGW's request to implement an annualized and levelized charge, the customer impacts of PGW's proposal and the importance of permitting PGW to begin to bill at the 7.5% level as early in calendar year 2016 as possible.

Specifically, I will explain PGW's agreement to withdraw its request related to a waiver of the obligation to pay interest on overcollections. I will further explain how PGW has a history of undercollection that is not being addressed under the current DSIC provisions, which supports the requested increase to 7.5%, exclusive of reconciliation.

I will explain my opposition to proposals to condition the request for levelization and annualization of PGW's DSIC. Simply put, there is no need for the proposed conditions, such as segregation of DSIC funds and quarterly adjustments. PGW's proposal already addresses the underlying concerns raised by the OCA's proposals. I will explain why the OSBA's proposal to use actual historical DSIC eligible capital spending – as opposed to the forecasted DSIC eligible capital spending – would frustrate the goal of accelerated main replacement and could result in wide swings in its allowable DSIC level.

In addition, I will also explain my views on the ratepayer impact analysis presented by OCA. In my opinion, OCA is incomplete because, in 2016, total bills are actually projected to be lower than in July, 2013.

II. INTEREST ON OVERCOLLECTIONS

Q. WHAT IS I&E'S POSITION ON PGW'S REQUEST FOR WAIVER ON THE PAYMENT OF INTEREST ON OVERCOLLECTIONS?

A. I&E disagrees with this request, and has taken the position that interest should be charged on overcollections to provide customers with assurance that PGW has an incentive to accomplish the pipeline replacement and infrastructure targets that it has set. I&E Statement No. 1, at 5-7.

Q. HOW DO YOU RESPOND?

A. After reviewing I&E's position, PGW agrees and withdraws its request to waive the obligation to pay interest on overcollections.

Q. DOES THE WITHDRAWAL OF THAT WAIVER REQUEST SATISFY SIMILAR CONCERNS RAISED BY OCA AND OSBA?

A. Yes. The interest related concerns of OCA and OSBA are now moot and no longer relevant. See OCA Statement No. 1 at 2, 6, 12, 14-16, 21; OSBA Statement No. 1, at 2, 14-15.

III. INCREASE TO 7.5%

Q. DO SOME PARTIES AGREE WITH PGW'S REQUEST TO INCREASE THE DSIC CAP?

A. Yes. I&E supports the request and has taken the position that the request is consistent with the PUC Staff Report.[1] I&E Statement No. 1, at 3-5. The Environmental Defense Fund also agrees with this request. EDF Statement No. 1, at 14.

Q. DO SOME PARTIES DISAGREE WITH PGW'S REQUEST TO INCREASE THE DSIC CAP?

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1 Staff Report: Inquiry into Philadelphia Gas Works' Pipeline Replacement Program, dated April 21, 2015.

A. Yes. Both OCA and OSBA raised concerns related to, among other things, the potential use of other funding sources. OCA Statement No. 1, at 3, 10-12; OSBA Statement No. 1, at 3-11. OCA also raised a concern related to PGW's capital budget. OCA Statement No. 1, at 4-5, 9.

Q. DO YOU AGREE WITH THE CONCERNS RAISED BY OCA AND OSBA?

A. No. All of these concerns are addressed in the rebuttal testimony of Joseph F. Golden, Jr. (PGW Statement No. 3-R).

Q. I&E WITNESSES COOPER SMITH AND HORENSKY SUGGEST THAT PGW SHOULD NOT BE ABLE TO BEGIN SPENDING THE INCREMENTAL DSIC REVENUE FROM THE 5% TO 7.5% INCREASE UNTIL IT HAS A PUC APPROVED DIMP AND LTIIP, AND HAS ADDRESSED WORKFORCE TRAINING. WHAT IS YOUR POSITION ON THEIR RECOMMENDATIONS?

A. Mr. Murray explains why PGW's proposed plan and timeline for filing and obtaining PUC approval for these various items will satisfy the concerns of these witnesses with respect to expending the incremental dollars made available by increasing the DSIC as PGW has proposed here. It is important however, that, regardless of the PUC's decision on expending the incremental DSIC revenues, it recognize that PGW must be permitted to begin to bill at the 7.5% level as soon as possible in calendar year 2016. PGW's billings are highly seasonal, with approximately 47% of its total revenues billed in January, February and March. If PGW is not permitted to increase its DSIC until its LTIIP is approved, which PGW anticipates will occur around May 1, it will only be able to bill about 44% of the incremental $11 million. If it nonetheless increases its main replacement program, the result would be a large undercolletion in 2017. This will not only

raise customer DSIC bills beyond the 7.5% but will also create a risk that PGW will not be able to "make up" the under collection, as I explain below.

Q. WHAT ABOUT OSBA'S VIEW THAT THE EFFECTIVE CAP IS 10% NOT 7.5%?

According to OSBA Witness Knecht, PGW will simply recover in the reconciliation any amount that it spends over 7.5%, the effective cap is 10% not 7.5% OSBA Statement No. 1, at 12-13. This is not correct because PGW's budget for accelerated main replacement is capped at the $33 million level. The only amounts that will exceed the 7.5% level will be amounts to recover undercollections. However, PGW has been unable to collect amounts spent in the past even after billing an under collection for almost twelve months. A history of the DSIC is set below. This history shows an undercollection of $4,101,365 from the inception of the DSIC in 2013 through September, 2015 despite reaching the current 5% cap in only a few quarters.

PHILADELPHIA GAS WORKS
DISTRIBUTION SYSTEM IMPROVEMENT CHARGE (DSIC)

Month	DSIC Rate[2]	DSIC Revenue Billed	DSIC Infrastructure Placed in Service
September 2012		$ -	$ -
October		$ -	$ -
November		$ -	$ -
December		$ -	$ -
January 2013		$ -	$ -
February		$ -	$ -
March		$ -	$ -
April		$ -	$ -
May		$ -	$ 3,787,345
June		$ -	$ -
July	3.02%	$ 238,646	$ -
August	3.02%	$ 442,329	$ 4,939,583
September 2013	3.02%	$ 473,982	$ -
October	4.14%	$ 631,215	$ -
November	4.14%	$ 1,374,992	$ 5,076,289
December	4.14%	$ 2,440,437	$ -
January 14	4.34%	$ 3,329,041	$ -
February	4.34%	$ 3,799,835	$ -
March	4.34%	$ 3,338,292	$ -
April	2.60%	$ 1,628,220	$ -
May	2.60%	$ 656,230	$ 5,685,180
June	2.60%	$ 442,690	$ -
July	5.00%	$ 571,895	$ -
August	5.00%	$ 698,803	$ 7,775,115
September 2014	5.00%	$ 722,636	$ -
October	5.00%	$ 812,714	$ -
November	5.00%	$ 1,517,663	$ 2,360,282
December	5.00%	$ 2,804,822	$ -
January 15	2.24%	$ 2,419,579	$ -
February	2.24%	$ 1,772,081	$ 1,932,098
March	2.24%	$ 1,655,303	$ -
April	2.09%	$ 983,528	$ -
May	2.09%	$ 458,174	$ 1,511,865
June	2.09%	$ 325,740	$ -
July	1.64%	$ 268,558	$ -
August	1.64%	$ 226,885	$ 5,290,744
September	1.64%	$ 222,845	
Total		$ 34,257,135	$ 38,358,501
Under-Collection		$ (4,101,365)	

[2] Note that the DSIC rate shown here is as filed in the quarterly filings and includes the reconciliation. OCA witness Everette's chart on pg. 7 line 9 of OCA St. 1 is DSIC spending and does not include the reconciliation.

IV. LEVELIZATION AND ANNUALIZATION

Q. WHAT IS I&E'S POSITION ON PGW'S REQUEST TO IMPLEMENT AN ANNUALIZED AND LEVELIZED CHARGE?

A. I&E supports the request and has pointed out that the request is consistent with the Staff Report. I&E Statement No. 1, at 3-5.

Q. WHAT CONDITIONS DOES OCA RECOMMEND THAT THE PENNSYLVANIA PUBLIC UTILITY COMMISSION ("COMMISSION" OR "PUC") IMPOSE TO PERMIT PGW TO IMPLEMENT AN ANNUALIZED AND LEVELIZED DSIC?

A. OCA Witness Everette recommends that the Commission only allow PGW to implement an annualized and levelized DSIC if it requires PGW: (1) to establish accounting standards to ensure that revenues collected from DSIC are used for DSIC-eligible spending; (2) to update the DSIC every quarter to reflect the most recent projected annual construction costs and projected quarterly revenues; and, (3) to develop a plan to enroll a greater percentage of customers in budget billing. OCA Statement No. 1, at 12-15, 20.

Q. DO YOU AGREE WITH OCA'S RECOMMENDATION THAT PGW BE REQUIRED TO SEGREGATE DSIC REVENUES FROM OTHER REVENUES AS A PRECONDITION TO IMPLEMENTING AN ANNUALIZED AND LEVELIZED DSIC?

A. No, there is no need to segregate DSIC revenues from other revenues. The DSIC is an automatic adjustment clause. The PUC's Division of Audits conducts audits on the DSIC periodically, and an annual reconciliation audit is conducted to ascertain any over or undercollections. 66 Pa. C.S. § 1358(e). Neither the audit process nor reconciliation process require segregation of funds. As a result of these filings, PGW is effectively doing precisely what the OCA witness appears to want: providing assurances that dollars collected for cast iron main replacement

are actually spent on cast iron main replacement. Any amounts collected but which are not spent on cast iron main replacement for some reason, will be returned to ratepayers, now with interest.

Q. DO YOU AGREE WITH OCA'S RECOMMENDATION THAT PGW BE REQUIRED TO UPDATE THE DSIC EVERY QUARTER TO REFLECT THE MOST RECENT PROJECTED ANNUAL CONSTRUCTION COSTS AND PROJECTED QUARTERLY REVENUES AS A PRECONDITION TO IMPLEMENTING AN ANNUALIZED AND LEVELIZED DSIC?

A. No. In my direct testimony, I proposed that PGW would review and revise the DSIC percentage on a quarterly basis and may make quarterly adjustments to the annualized DSIC for the difference between projected and actual billed amounts, and to recognize changes to the construction budget during the year for the accelerated replacement. In short, PGW has already proposed to review the DSIC quarterly and adjust the percentage to account for these items. This should not be a hard and fast requirement because if the differences between actual and projected amounts are diminimus, the cost of making the adjustments might outweigh the benefits. But PGW certainly expects to adjust the DSIC levels for material differences.

Q. PLEASE RESPOND TO THE OCA'S RECOMMENDATION THAT PGW BE REQUIRED TO DEVELOP A PLAN TO ENROLL A GREATER PERCENTAGE OF CUSTOMERS IN BUDGET BILLING AS A PRECONDITION TO IMPLEMENTING AN ANNUALIZED AND LEVELIZED DSIC?

PGW has had a budget billing offering since before it came under PUC jurisdiction. As of October 2015, it had over 42,000 customers in its (non-payment agreement) budget billing program and as far as it knows, the program meets all PUC regulatory requirements and is adequately serving all customers who wish to avail themselves of it. In addition, many PGW customers are

provided with payment agreements. As reported in the PUC's 2014 Universal Service & Collections Performance report ("Collections Report"), residential customers were provided with 77,936 (non-CAP, PGW and PUC provided) payment agreements in 2014; of this number 53,491 agreements were for confirmed low-income customers. Virtually all payment agreement customers are required to enroll in budget billing and remit their monthly payment agreement amount in addition to its budget billing amount. Further, as reported in the Collections Report, PGW's customer assistance program, called the Customer Responsibility Program ("CRP"), had 61,319 participants enrolled as of December 31, 2014. These programs all provide customers with a level of regularity in their monthly payments. But PGW customers take advantage of these programs based on eligibility and need/desire. It would be inappropriate to force a customer onto a program such as budget billing, particularly when the customer may not want to participate in this program. Thus, there is no basis for modifying these programs at this time.

Q. DOES OSBA MAKE ANY RECOMMENDATIONS REGARDING PGW'S PROPOSED ANNUALIZED AND LEVELIZED DSIC?

A. Yes, OSBA Witness Knecht recommends that annualization be based on actual historical DSIC-eligible capital spending, rather than forecast spending. OSBA Statement No. 1, at 13-14.

Q. DO YOU AGREE WITH THIS RECOMMENDATION?

A. No. Basing the DSIC rate on actual historical DSIC eligible capital spending would not be appropriate because the historic DSIC revenue is set based on the level of DSIC spending in the prior year's period in which PGW's DSIC was not levelized. Mr. Knecht's proposal would seem to perpetuate the current problem

explained in my Direct Testimony in which, because of seasonal variations in construction activity, basing DSIC billings on the prior quarter's installation levels creates wide swings in its billed DSIC levels. Also going from $22 million to $33 million in the first year of DSIC spending would not be reflected in the DSIC rate.

In comparison, basing the DSIC rate on forecasted DSIC eligible capital spending would provide revenue as the spending is occurring and would correspond with the "pay as you go" method of billing for DSIC and PGW's cash flow methodology.

V. RATEPAYER IMPACT

Q. OCA WITNESS EVERETT OPINES THAT CUSTOMER IMPACTS ARE ACTUALLY GREATER THAN GOING FROM 5% TO 7.5%. OCA STATEMENT NO. 1, AT 17-18. HOW DO YOU RESPOND?

A. Actual customer impacts in fact will not reflect a DSIC percentage change from 5% to 7.5% – the customers will actually see a net decrease in their rates. In 2016, bills are actually projected to be lower than in July, 2013. At the inception of the DSIC billing in July, 2013 the average residential heating customer using 83 Mcf would have been billed in total $1,427.70 per year at the 5% DSIC cap. As shown in the response to OSBA Set 1-7, the average residential heating customer using 83 Mcf would be billed in total $1,217.16 per year at a 7.5% DSIC cap, or $210.54 less per year.

VI. CONCLUSION

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

VERIFICATION

I, Kenneth S. Dybalski, hereby state that: (1) I am the Director - Gas Planning & Rates for Philadelphia Gas Works; (2) the facts above set forth in the foregoing document are true and correct (or are true and correct to the best of my knowledge, information and belief); and (3) that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Kenneth S. Dybalski

PGW St. 3-R

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

REBUTTAL TESTIMONY OF

JOSEPH F. GOLDEN, JR.

ON BEHALF OF
PHILADELPHIA GAS WORKS

Docket No. P-2015-2501500

Revisions To PGW Distribution
System Improvement Charge

October 29, 2015

I. INTRODUCTION

Q. *PLEASE STATE YOUR NAME AND POSITION WITH THE COMPANY.*

A. My name is Joseph F. Golden, Jr. My position is Executive Vice President and Acting Chief Financial Officer for Philadelphia Gas Works (PGW or Company).

Q. HOW LONG HAVE YOU HELD THIS POSITION?

A. I was appointed Executive Vice President and Acting Chief Financial Officer in March 2012. I started with PGW in August 1986. My prior titles at PGW include: Controller, Treasurer, Manager Treasury Department, Senior Staff Accountant, and Staff Accountant. Before starting with PGW, I had prior work experience in public accounting, treasury accounting and cash management, and cost accounting for a manufacturing company.

Q. WHAT ARE YOUR VARIOUS JOB RESPONSIBILITIES?

A. In my present position, I am responsible for the treasury, accounting, budgeting, strategic development and gas planning functions.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND.

A. I hold a Bachelor of Science degree in Accounting from Villanova University, a Master of Business Administration degree from Drexel University, and a Juris Doctor degree, cum laude, from Temple University School of Law.

Q. HAVE YOU EVER PROVIDED TESTIMONY BEFORE THIS COMMISSION?

A. No.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. My rebuttal testimony responds to the prefiled direct testimony of the following witnesses, who prefiled direct testimony on October 19, 2015:

- Office of Consumer Advocate (OCA) witness, Ashley E. Everette (OCA Statement No. 1); and
- Office of Small Business Advocate (OSBA) witness: Robert D. Knecht (OSBA Statement No. 1).

Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.

A. My rebuttal testimony addresses suggestions regarding non-DSIC sources of financing for the accelerated main replacement program, the suggestion that PGW should fund its program by issuing long term debt and the requirements of PGW's capital budget process. I show that it is not appropriate or consistent with the Distribution System Improvement Charge (DSIC) statute or the Pennsylvania Public Utility Commission's (PUC) DSIC regulations to consider items that are normally considered in base rate proceedings as a funding source for accelerated main replacement in lieu of the DSIC. Nor is PGW in the financial position that it could comfortably finance its proposed increase in DSIC-funded main replacement from its present base rates without threatening its current financial health. Moreover, I show that financing the accelerated main replacement program through the issuance of long term debt would not only have a deleterious effect on PGW's debt to total capitalization ratios, but would also be more expensive to ratepayers in the long term. Finally, I explain that PGW's contemplated main replacement levels are fully consistent with its capital budget.

II. NON-DSIC SOURCES OF FINANCING

Q. OSBA WITNESS KNECHT AND OCA WITNESS EVERETTE SUGGEST THAT PGW SHOULD USE INTERNALLY GENERATED FUNDS OR OTHER IDENTIFIED EXPENSE REDUCTIONS[1] TO PAY FOR THE ACCELERATED REPLACEMENT OF MAINS RATHER THAN UTILIZING THE DSIC MECHANISM AUTHORIZED BY ACT 11. OSBA STATEMENT NO. 1, AT 4-11; OCA STATEMENT NO 1, AT 10, 20. HOW DO YOU RESPOND?

A. This argument fails to acknowledge that the DSIC was created by the General Assembly to be used by PGW (and others) as an additional mechanism beyond a company's base rates to recover costs related to the accelerated repair, improvement and replacement of eligible property. Claims that accelerated main replacement should be financed from base rates are essentially the same arguments that opponents of the DSIC made when the legislation was considered by the General Assembly. If the Legislature wanted to force public utilities, including PGW, to fund the accelerated replacement of their infrastructure via allowances in base rates there would have been no need to enact the DSIC mechanism. The additional dollars that these witnesses claim are available to fund the proposed cast iron main acceleration program are from items (e.g., internally generated funds, cash flow, bond refinancings) that either are or would normally be part of a determination of just and reasonable base rates for PGW. Moreover, it is not appropriate to single out one or a handful of those items as a source of funding for additional capital improvements without considering the myriad of cost items that have gone up (or have emerged) since PGW's last base

[1] OCA witness Everette suggests that PGW should use additional bond refinaincings and bond reissuances to pay for the accelerated replacement of mains. OCA Statement No. 1, at 10, 20.

rate proceeding, which was more than six years ago. I note that in its Implementation Order, the Commission made clear that the DSIC "is intended to be a straightforward mechanism which is easy to calculate, easy to audit and which does not require a full rate case analysis"[2] and is "not intended to revisit matters decided in [past rate cases]."[3]

Q. MR. KNECHT SUGGESTS THAT PGW COULD FINANCE THE ACCELERATED MAIN REPLACEMENT PROGRAM FOR WHICH IT IS REQUESTING A DSIC INCREASE THROUGH ITS CURRENT BASE RATES AND HAVE NO ADVERSE EFFECT ON PGW FINANCIALLY. DO YOU AGREE?

A. No. Even if it were appropriate to consider base rates as a funding source for this program, it would not be feasible to fund the proposed main replacement program through existing base rates without having a negative effect on the Company's financial health. Mr. Knecht's chart on page 5 of his testimony (Table IEc-1) shows PGW's current budget projections assuming that its accelerated main replacement is funded via DSIC and it receives a $40 million base rate increase in September 2017 and a $20 million base rate increase in fiscal year 2021. Understandably, those financial indicators are not seriously eroded during the period reviewed. However, Mr. Knecht fails to recognize that using some $11 million from PGW's existing base rates to fund these additional capital improvements would erode its financial indicators to unacceptable levels. Most importantly, funding PGW's accelerated main replacement program from current base rates would reduce PGW's available levels of year-end cash – the key

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2 *Implementation of Act 11 of 2012*, M-2012-2293611, at 39.

3 *Id.* at 29.

indicator for PGW – below current levels and below those suggested to maintain its current bond ratings. Attached hereto is a report from an investment rating service. The report has made clear that, to maintain its current, mid-level bond rating (which has improved from the "one step above junk bond" level in 2008), PGW needs to have at least 60-90 days of cash on hand at fiscal year-end.[4] PGW's currently projected level of cash ($106 million, assuming DSIC funding) equates to approximately 65 days of cash on hand at fiscal year-end. Funding $11 million of accelerated main replacement from base rates would reduce PGW's cash levels to 59 days of cash on hand, below the level at least one investment service characterizes as the minimum for a public power company of "mid-range" financial strength.[5] Notably, that same investment rating service characterized a "stronger" public power entity as having at least 120 "days of cash on hand" at year end.[6] In addition, funding the accelerated main replacement from base rates rather than from the DSIC would reduce PGW's coverages in FY 2015 to 1.59 and have a negative effect on its debt to total capitalization ratio.

The Commission is well aware that PGW has only recently emerged from over a decade of extreme financial distress in which it had to ask for and receive at least three emergency or extraordinary rate increases, regularly hit up against its maximum short-term borrowing ability, and, due to the complete lack of internally generated funds, had to issue long-term debt such that its debt to total

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4 Days of cash on hand is total cash divided by operating expenses.

5 Exhibit JFG-1, FitchRatings, U.S. Public Power Rating Criteria at 9.

6 See, Exhibit JFG-1, FitchRatings, U.S. Public Power Rating Criteria at 9.

capitalization ratio reached approximately 85%. PGW had to fully utilize its short-term debt (commercial paper) program merely to have sufficient cash on hand throughout the year to pay its obligations, leaving it with no "cushion" or fallback for contingencies. Due to the Commission's willingness to permit PGW to receive necessary rate increases, as well as PGW's work to improve efficiencies, increase collections and manage expenses, PGW's financial position has improved in the last few years. PGW has not had to utilize its short-term commercial paper program for working capital since 2009, and has financed a portion of its construction program through internally generated funds, resulting in a reduction of its debt ratio to the current 71.7% level at the end of fiscal year 2014. These steps have resulted in PGW's bonds being upgraded to "Baa1" (Moody's Investors Service), "A-" Positive Outlook (Standard & Poor's Ratings Services), and "BBB+" (FitchRatings).

Moreover, only recently has PGW been able to maintain an adequate year-end cash balance – a key determinant of the financial strength of a utility and an indication of the adequacy of rates for a cash flow company – at around the $100 million level, or 65 days of cash. As noted the bond rating agencies indicate that PGW needs to increase its days of cash on hand level by 25% to 50% to provide continued financial flexibility and maintain or increase its current bond ratings.

The Company certainly would not risk this recent improvement in its financial position by incurring the significant obligation represented by the main acceleration program PGW has proposed here without the assurance that the additional expenditures will be funded from the DSIC – or some other new source

of revenues. To do otherwise would risk the financial health of the Company that has been so long in developing and redound to the detriment of its customers.

Q. OSBA WITNESS KNECHT SUGGESTS THAT PGW COULD USE TEMPORARY FUNDING MECHANISMS, SUCH AS SHORT TERM BONDS, TO PAY FOR THE ACCELERATED REPLACEMENT OF MAINS. OSBA STATEMENT NO. 1, AT 4. HOW DO YOU RESPOND?

A. PGW's Commercial Paper Program previously was restricted for the financing of inventory and receivables as a working capital financing program. Recently, this program was expanded to temporarily finance capital projects. However, the letters of credit supporting the commercial paper program are limited to $120 million. For capital projects, PGW has already utilized $30 million of this program in Fiscal Year 2015 with a forecast to use an additional $48 million in Fiscal Year 2016, even if the DSIC request is granted. This leaves only $42 million of additional borrowing capacity for working capital or capital projects. The commercial paper program is designed to be principally available to address temporary cash shortfalls, not to permanently fund capital improvements. Moreover, funding capital improvements is limited to the term of the letter of credit agreements pursuant to which the commercial paper is issued.

Q. OSBA WITNESS KNECHT ALSO SUGGESTS THAT PGW COULD ISSUE LONG-TERM BONDS, TO PAY FOR THE ACCELERATED REPLACEMENT OF MAINS AND THAT USING THIS FUNDING MECHANISM WOULD BE LESS EXPENSIVE FOR RATEPAYERS THAN THE "PAY AS YOU GO" METHOD PGW PROPOSES TO USE TO FINANCE ITS DSIC MAIN REPLACEMENT. OSBA STATEMENT NO. 1, AT 4. DO YOU AGREE?

A. No. First, I would note that PGW's proposal to fund the additional main replacement on a "pay as you go" basis is specifically authorized by Act 11, was

authorized by the Commission[7] and is reflected in PGW's approved Tariff.[8] Moreover, it would not be prudent to fund this accelerated main replacement program using long-term debt, when there exists a mechanism to avoid issuing more debt for this purpose. As noted above, PGW has worked tirelessly to try to reduce costs and improve efficiency so that it could fund a portion of its capital improvement program through internally generated funds or other sources, other than through long-term bond issuances. It also determined to go ahead with its existing accelerated main replacement program only because it was able to fund the $22 million annual expenditure through the DSIC mechanism on a "pay as you go" basis. As a result, PGW has made significant progress in reducing its extremely leveraged debt ratio from approximately 85% to its current 71.7% level at the end of Fiscal Year 2014 (with additional improvement to 68.4% at the end of Fiscal Year 2015) and has contributed to PGW being able to obtain upgrades in its bond rating. PGW's improved bond rating means that the cost of financing that will have to be imposed on ratepayers when new bond issuances are needed will be materially lower than in the past. Forcing PGW to take on additional debt to fund accelerated main replacement, thus raising its debt ratio again will risk its improved bond rating as well as pose a risk to its overall financial health.

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7 *Petition of Philadelphia Gas Works For Approval of its Long-Term Infrastructure Improvement Plan*, PUC Docket No. P-2012-2337737, et al., Opinion and Order entered on April 4, 2013; Implementation of Act 11 of 2012, PUC Docket No. M-2012-2293611, *Final Implementation Order* entered August 2, 2013, at 3.

8 PGW, Gas Service Tariff, Pa PUC No. 2, Eleventh Revised Page No. 151 to Second Revised Page No. 153.

Q. MR. KNECHT ALSO CLAIMED THAT FINANCING THE PROPOSED ACCELERATION PROGRAM WITH LONG TERM DEBT WOULD BE CHEAPER TO RATEPAYERS THAN FUNDING IT ON A "PAY AS YOU GO" BASIS. IS HE CORRECT?

A. No. Mr. Knecht did not consider that the amount that would be recovered in the DSIC would be both the debt service and the debt service coverage associated with the bond. PGW's bond ordinances, and PUC regulations,[9] require that it maintain coverages of at least 1.5 times the debt service. Accordingly, DSIC recovery for bond financed accelerated main replacement would be 50% more than just the debt service. Moreover, because PGW would have to continue to issue bonds every so often to continue to fund the accelerated main replacement, the cost of financing through long-term debt continues to grow over time. Because of the debt service factor, the cost to the customer of funding the program via a long-term debt option becomes more expensive than the DSIC option in relatively short order, as the following chart illustrates.[10]

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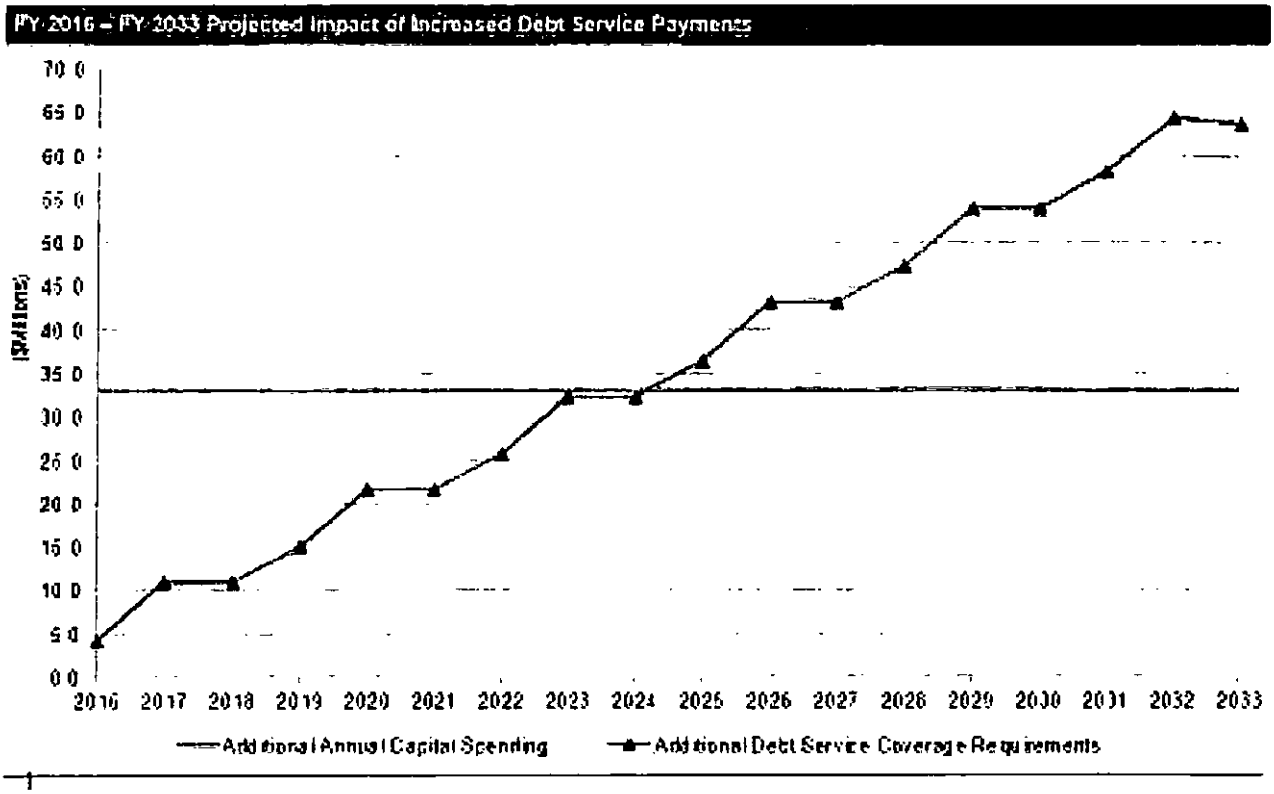
9 See 66 Pa.C.S.A. § 2212(e);52 Pa. Code §§ 69.270(b), 69.2703(b).

10 Mr. Knecht also claims that this analysis should recognize what claims to be the higher discount rate for ratepayers compared to PGW's interest rate on its bonds (OSBA St. No/ 1 at 7-10, 14). In addition to not taking into account the debt service coverage requirement, Mr. Knecht appears to make the assumptions about discount rates that don't appear to have any empirical basis. For example, it isn't clear why the appropriate discount rate for ratepayers is not the after tax interest rate on a customer's mortgage, which would be around the same level as PGW's debt interest rate, after costs of issuance etc. Moreover, in some years while the DSIC charge may increase, overall rates may decrease, due to reductions in gas or other costs. For that reason, applying a "time value" analysis to these stream of payments would not appear to produce useful information.

Annual Escalation of Debt Service Payments at 1.5x Coverage



Q. OSBA WITNESS KNECHT AND OCA WITNESS EVERETTE SUGGEST THAT PGW SHOULD BE REQUIRED TO REQUEST THAT THE CITY OF PHILADELPHIA WAIVE, OR GRANT-BACK, SOME OR ALL OF THE $18 MILLION PAYMENT IT RECEIVES FROM PGW SO THAT SUCH FUNDS COULD BE USED TO PAY FOR THE ACCELERATED REPLACEMENT OF MAINS. OSBA STATEMENT NO 1, AT 9; OCA STATEMENT NO 1, AT 10-11, 20. HOW DO YOU RESPOND?

A. First, it is solely within the power of the City of Philadelphia, PGW's owner, to determine whether or not the $18 million payment is to be granted back. PGW has no ability or authority to require that. As such, having PGW "ask" the City is pointless. The City is aware of the suggestion in the PUC Staff Report, as well as similar suggestions made in the recent past, and has considered and rejected them under the present circumstances.

Further, having the City fund capital improvements by granting back the City Fee is not appropriate policy. Some may view the $18 million payment as the only return or payment the City receives from its ownership of the gas distribution system, funding the accelerated main replacement in this way would be similar to demanding that an investor owned utility fund distribution infrastructure investments solely from shareholder equity, without any ability to recover those expenditures from ratepayers.[11]

I acknowledge that the City did grant back the $18 million payment between 2004 and 2010. It is my understanding that the granting-back of those payments was done to insure the financial health of PGW, *i.e.*, to help ensure that a financial crisis did not take place. Such circumstances are not presented in this Petition.

Moreover, the OSBA and OCA suggestion to fund main replacement in this way is not consistent with the way PGW's rates are set by the Commission. The City of Philadelphia has an Ordinance requiring PGW to make a payment of $18 million to the City. When setting rates for PGW, the financial measures considered by the Commission include, among other things, that Ordinance. See 52 Pa. Code § 69.2703(c). In addition, it is my understanding that Section 2212(f) of the Public Utility Code provides direction to the Commission regarding PGW's obligation to meet the $18 million payment to the City. That Section provides as follows:

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[11] The Pennsylvania Supreme Court has determined that the $18 million payment by PGW to the City represented a reasonable rate of return that was rationally related to the City's asserted equity in PGW. *Public Advocate v. Philadelphia Gas Commission*, 654 A. 2d 1156, 1062 (Pa. 1996).

> The Commission shall permit the city natural gas distribution operation to impose, charge or collect rates and charges as necessary to permit the city natural gas distribution operation to transfer or pay to the city that is the owner of the city natural gas distribution operation, on an annual basis, such amount as may be specified from time to time in the applicable ordinances of the city or agreement of the city approved by ordinances.

66 Pa. C.S. § 2212(f). The Commission is permitted to review and approve only that portion of the City payment that exceeds 110% of the amount authorized, if that were to occur.

Q. OCA WITNESS EVERETTE GENERALLY RECOMMENDS THAT THE WAIVERS REQUESTED BY PGW SHOULD BE CONDITIONED ON THE COMMITMENT BY PGW TO EVALUATE AND PURSUE OTHER NON-RATEPAYER FUNDING SOURCES BEFORE ANY DSIC INCREASE GOES INTO EFFECT. OCA STATEMENT NO. 1, AT 3, 10-11, 20. HOW DO YOU RESPOND?

A. Again, this position is tantamount to suggesting that before it may utilize a DSIC a utility must show that its base rates are not sufficient to justify funding accelerated infrastructure. The Commission and the General Assembly appeared to make quite clear that the DSIC was intended to be in addition to whatever regular capital expenditures a utility might make, the costs of which would be recovered in base rates.

Moreover, PGW considered each of the recommendations for additional funding of accelerated main replacement contained in the Staff Report before filing the subject Petition, and explained that consideration and rationale in its Petition.[12] At this point, there exists no other source of funds that would not

[12] PGW Petition at 13, n. 31.

otherwise impact PGW's base rates that could be used to finance PGW's accelerated main replacement program.

III. PGW CAPITAL BUDGET

Q. OCA WITNESS EVERETTE OPINES THAT PGW'S CAPITAL BUDGET DOES NOT ALLOW PGW TO SPEND THE AMOUNT THAT PGW HAS PROPOSED IN THE DSIC FOR FISCAL YEAR 2016. OCA STATEMENT NO. 1, AT 4-5, 9. IS SHE CORRECT?

A. No. The steps required by the capital budget process will be completed before any incremental DSIC monies are spent by PGW.

The capital budget process provides for the evolving capital needs and related expenditures of PGW. PGW's capital budget is reviewed by both the Philadelphia Gas Commission and City Council. It is a line item financial budget. Line items may have a multiple fiscal year lifespan. The capital budget for Fiscal Year 2016[13] was approved by City Council on June 18, 2015. Spending by PGW in Fiscal Year 2016 would include spending on projects from both the Fiscal Year 2015 and Fiscal Year 2016 approved capital budgets.

V. CONCLUSION

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

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[13] The fiscal year of PGW begins on September 1 and ends on August 31 of the following calendar year.

VERIFICATION

I, Joseph F. Golden, Jr., hereby state that: (1) I am the Executive Vice President and Acting Chief Financial Officer for Philadelphia Gas Works; (2) the facts above set forth in the foregoing document are true and correct (or are true and correct to the best of my knowledge, information and belief); and (3) that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Joseph F. Golden, Jr.

Exhibit JFG-1

U.S. Public Power Rating Criteria

Sector-Specific Criteria

Inside This Report

This criteria report replaces the prior version of the same title, dated Jan. 11, 2012. There have been no substantial changes to the criterion.

Related Research

2013 Outlook: U.S. Public Power and Electric Cooperative Sector — Nothing Shocking (December 2012)

U.S. Public Power Peer Study — June 2012 (June 2012)

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Scope

This criteria report details Fitch Ratings' approach to rating U.S. public power systems. It is a sector-specific extension of Fitch's global master criteria report, "Revenue-Supported Rating Criteria." More specifically, the report elaborates on five key areas of operational and financial importance to the credit quality of municipal and cooperative power entities: governance and management strategy; assets and operations; cost structure; financial performance and legal provisions; and customer profile and service area.

These key elements of Fitch's public power rating criteria remain largely consistent with its prior criteria reports. However, the weighting of individual credit factors changes as the industry evolves, particularly in response to new regulatory initiatives or as new market dynamics emerge. In addition, not all rating factors outlined in this report apply to each individual rating or rating action. Each specific rating action commentary or rating report discusses those factors most relevant to the individual rating decisions.

Key Rating Drivers

Rate Sufficiency and Flexibility: A public power utility's ability and willingness to maintain *rates sufficient to meet all of its financial obligations is of paramount importance. Fitch* considers how a utility's rate structure affects its capacity for the full and timely recovery of costs, as well as its flexibility to raise additional revenue. Ratemaking autonomy and the process for adjusting rates factor into this analysis.

Comprehensive Strategic Planning and Risk Management: The extent of strategic planning and risk management performed by a utility is a key indicator of management's preparedness and sophistication, and an important rating factor. Fitch typically reviews prior strategic and financial plans versus actual outcomes, as well as newly adopted strategies, to gauge management effectiveness.

Resource Adequacy and Performance: Ensuring the adequacy of power supply resources to meet current and projected demand is a fundamental planning requirement of public power utilities. Together with demonstrated operating efficiency, it is an important factor in providing a low-cost, reliable energy supply. Fitch measures resource adequacy and performance against industry standards for cost and reliability.

Financial Strength and Forecasting: The strength and stability of a utility's financial metrics reveal its ability to meet all financial obligations, and detailed financial forecasting provides an indication of future performance. Fitch reviews a broad array of historical and projected financial metrics in an assessment of a utility's financial strength, as well as a utility's adherence to adopted financial policies. Financial metrics focus principally on three core areas: cash flow, liquidity, and capital structure.

Service Area Composition and Depth: Service area characteristics demonstrate the breadth, depth, and stability of a utility's constituents, as well as their financial wherewithal. Fitch considers customer composition and concentration; income levels; and employment, population, and sales growth trends in this assessment.

Public Power Ratings in Context

U.S. public power utilities are effectively owned by their customers and operate with a mission to provide essential, reliable, and relatively low-cost electric service. Fitch's average rating for retail systems in the sector is 'A+', compared with an Issuer Default Rating of 'BBB+' for investor-owned utilities.

Key credit characteristics supporting higher ratings for public power utilities include their self-regulating authority, predominantly residential customer bases, and lower consolidated enterprise risk. Self-regulating authority allows for the more timely recovery of costs through electric rates, while higher proportions of residential customers provide for more stable energy sales and, in turn, more predictable financial operations. Efforts to diversify operations in the public power sector are extremely rare.

Governance and Management Strategy

The strength of a utility's senior management and governing body — usually an independent board of directors or elected city council — is a key credit consideration in Fitch's analytical process. Management's experience and ability to design and implement a comprehensive strategic plan is important to an issuer's rating, as is its ability to respond to unforeseen circumstances. A high degree of board or city council understanding and support of a utility's business strategy and the issues facing the utility is also important.

Achieving Strategic Goals

Fitch typically reviews prior strategic and financial plans versus actual outcomes in an assessment of management and governance effectiveness. A stronger management team consistently meets or exceeds financial projections, and deals well with unexpected developments. Moreover, Fitch takes into account the reasonableness of key financial and operational planning assumptions in its assessment.

Major Components of a Comprehensive Strategic Plan

Forecasts of customer and load growth.
New generation, transmission, or distribution requirements.
Plans to meet capital needs, including financing schedules.
Plans for rate increases.
Financial projections, including stress scenarios.
Risk-management procedures and analysis.

Comprehensive Resource Planning

Fitch analyzes a utility's integrated resource plan and its long-term strategies to provide reliable, high-quality, and low-cost service to its customers to determine if they are adequate and reasonable. Fitch monitors the implementation of those strategies and a utility's financial flexibility for responding to changing market conditions.

Fitch discusses with management the purpose, amount, and structure of planned debt issuances, and any debt-management policies in assessing a utility's capital needs and their effect on its future debt profile and financial performance. Fitch assesses the willingness and

Related Criteria

Criteria for Rating Prepaid Energy Transactions (August 2012)

Criteria for Assigning Short-Term Ratings Based on Internal Liquidity (June 2012)

Revenue-Supported Rating Criteria (June 2012)

Attributes: Governance and Management

Stronger

Management and board of directors with extensive experience.

An objective, engaged board of directors.

Transparency and strong communication between management, the board of directors, and customers

In the case of wholesale power systems, coordinated efforts among member utility systems and the governing body.

Frequent analysis and updating of financial forecasts and resource management plans.

Well-developed and documented risk-management policies and procedures.

Documented succession planning.

Midrange

Generally stable management team and board of directors with modest turnover.

Comprehensive strategic and resource plans, forecasts of demand, and risk-management policies that generally reflect current economic, system, and political conditions.

Weaker

A detached, politically-appointed board of directors.

Lack of experience or frequent turnover of management.

Significant political pressure in the underlying municipality or in the members' service area.

Failure to maintain open communication between the utility and the board of directors, which may reveal itself in unexpected, significant rate increases.

Limited financial forecasting and rate planning.

Lack of adequate risk-management policies and procedures.

ability of an issuer's management and governing body to increase rates to ensure the measured, timely, and adequate recovery of total costs. Fitch also evaluates the likely effect of rate increases on a utility's financial performance relative to its peer group.

Preparing for Uncertainties

The extent of risk management performed by a utility is a key indicator of management's sophistication. Fitch believes that the ability to manage unforeseen circumstances without causing material changes to the utility's financial or operating position is a good indication of management planning and preparedness. Fitch views favorably a management team that is able to recognize and discuss risks (and mitigating factors) that could affect a system, and in turn, bondholder security. Such risks include participation in the fuel and energy commodity markets; plans for managing a large generation unit or transmission outage; reliance on off-system counterparty credit quality; and the effect of regulatory or legislative changes.

Assets and Operations

Fitch analyzes the generation, transmission, and distribution assets of wholesale and retail power systems to determine if a utility's power supply mix and asset operating performance adequately meet existing and future demand requirements. Fitch also analyzes how a utility's power supply mix and performance compare to similar systems.

Generation Benchmarking

Fitch benchmarks a utility's generation mix to that of industry standards, the regional market in which the utility operates, and other utilities in the rating category. This allows for a comparative analysis of a utility's relative strengths and weaknesses. Fitch considers the following areas in its assessment of generation:

- Fuel mix;
- Plant availability and capacity factors;
- Load factor;

- Heat rate; and
- Environmental mandates or goals.

Fitch looks through the wholesale provider and performs a similar assessment for distribution systems that purchase power under bilateral contractual agreements from a joint-action agency or cooperative.

New Power Resources

Fitch analyzes how a utility's customer or load growth, expiring purchase power contracts, aging generation fleet, and renewable mandates influence the demand for future power resources. Fitch considers the following areas in its assessment of a utility's integrated resource plan:

- The type of generation chosen and alternatives considered;
- The size and cost of the unit;
- The effect of the unit on the utility's existing portfolio resource mix (baseload, intermediate, or peaking);
- The availability of transmission and distribution resources; and
- Environmental factors.

Building and owning assets provides many benefits, such as:

- Control of asset operation;
- Limited counterparty risk and collateral-posting (requirements associated with power purchases); and
- Equity associated with owning a long-term asset.

However, there are also benefits to being a power purchaser in periods when market power supply is ample and electric transmission access is available. Some small- to medium-sized systems can benefit from avoiding large, costly capital programs and operating obligations that come with owned generation.

Attributes: Assets and Operations

Stronger
A stable, diverse, and regionally cost-effective power resource mix.
Adequate fuel supply contracts and a well-constructed fuel-hedging strategy.
Sound operating performance that is in line with or better than industry standards.
Adequate reliability and redundancy.
A power supply plan to maintain load balance.
Sufficient transmission access.

Midrange
A power supply mix in line with the region.
Fuel-hedging strategy that strives to minimize fuel price volatility at competitive prices.
Sound asset operations, comparable to industry standards.
Limited outages that cause resources to perform below industry standards.
Evolving power supply plan that might have an open position.

Weaker
A generation portfolio that is uneconomic or might ultimately pose unusual environmental concerns.
Dependency on a single fuel or generation site.
Below-average reliability levels stemming from frequent outages, high line losses, theft, or customer dissatisfaction.
Excessive dependence on the open market for either spot power purchases or sales of surplus power.
Lack of a comprehensive power supply plan.

Fitch does not typically evaluate the merits of owning generation versus purchasing power. On the contrary, Fitch's analysis considers the costs and benefits to individual utilities of both scenarios.

Renewable Resources

Fitch reviews a utility's strategy for developing renewable or alternative power generation to gauge how a utility's generation mix will change, particularly when it must comply with a state renewable portfolio standard. Fitch also evaluates the capital and operational costs of the projects, and how they will ultimately affect customer rates.

Renewable energy projects are expected to have long-term environmental benefits. However, the intermittent nature of their generation and higher operating costs relative to traditional generating resources can pressure a utility's financial operations without adequate cost recovery. The availability and types of these resources and the transmission capability vary by region.

Environmental Considerations

Fitch conducts a review of a utility's compliance with current and proposed environmental standards to fully understand a system's future capital needs and operating expenses. Environmental retrofits can be costly on a capital basis and from an operating perspective, as increased captive consumption often results in lower plant output. The cost to retrofit may be high for older, coal-fired generating facilities, rendering the generating facility uneconomic and subject to retirement. As such, the effect of more restrictive federal and state environmental policies can have significant operating and financial repercussions for a utility.

Fuel-Supply Management

Fitch reviews a utility's hedging techniques as part of its risk-management assessment. The ability to manage fuel costs is a key credit factor, because fuel is often a utility's largest budgetary expense. Hedging can be critical to the financial stability of, for example, a retail distribution system that purchases a portion of its power in the spot market.

The use of financial markets and power derivatives can help mitigate the risk of price volatility or a longer term trend of increasing prices. However, these instruments can leave a utility exposed to a drop in fuel prices, which can render certain hedges uneconomic, or "out of the money." This might require a collateral posting by the utility that, if coupled with declines in operating performance, could tighten liquidity and result in negative credit pressures.

Other factors of the fuel supply that Fitch considers include:

- Diversity of fuel mix;
- Flexibility of fuel agreements;
- Fuel transportation arrangements; and
- Alternative fuels, if primary sources are not available.

The optimal fuel-supply strategy varies by utility. It is driven by the diversity of generating resources, sufficiency of fuel sources, and the ability to mitigate associated risks.

Off-System Sales and Purchases

Heavy reliance on off-system sales is viewed as a negative credit factor as revenues tend to be more volatile, reflecting inherently variable power market prices. However, a power generator's off-system sales to non-native load can reduce existing customers' costs or provide surplus funds for reinvestment in system facilities, depending on market conditions.

Conversely, spot purchases can increase overall cost efficiency if power generators can purchase power in the open market when the cost is beneficial (the market cost of power is lower than the cost of a system's own generation). However, short-term purchases will also expose issuers to greater cost volatility.

Distribution and Transmission

Fitch's review of a distribution system includes an assessment of its reliability, as measured by the frequency of outages, line losses, etc., and the extent and timeliness of necessary capital improvements for its traditionally "wires only" infrastructure. Fitch views the distribution function largely as a monopoly-type, stable business with limited business risk.

Fitch evaluates the level of historical and planned system investment to determine if customer growth will affect the operations of the existing system relative to a peer group. Fitch also reviews a utility's business strategy regarding its transmission connection with a regional operator or other transmission system that can provide it with reliable access to market power, if needed.

Cost Structure

Fitch analyzes a utility's cost structure and methods of adjusting rates to determine its rate-raising flexibility for the timely funding of financial operations and capital needs. The analysis is conducted "bottom up," by looking at the costs to generate (or purchase) and supply electricity to customers, and "top down," by examining the structure of retail rates charged to different customer classes. A utility with overall rates that are below neighboring systems or systems with similar fuel mixes is generally viewed as having greater flexibility to use rates as a tool for funding, and strong service territory income measures typically enhance this flexibility.

Local Rate-Setting Authority

Fitch views the flexibility most municipal systems and electric cooperatives have to independently adjust rates as a positive credit factor and distinguishing characteristic from comparable investor-owned utilities. Most public power systems are not subject to regulation by state public service commissions. Instead, public power systems typically maintain local authority to adjust rates as needed, which contributes to the timely recovery of costs. This provides management with the ability to raise rates to maintain financial stability, build liquidity, or pay for portions of a capital improvement plan.

Fitch also considers the use of automatic or interim rate adjustments, which further ensure timely cost recovery, in its assessment of a utility's rate structure. Interim adjustments that may be implemented by a utility's management team — without the involvement of a governing board — can help ensure the overall stability of financial operations.

Attributes: Cost Structure

Stronger
Sole authority to set appropriate customer or member rates and a demonstrated willingness to do so.
Retail/wholesale rates are typically below those of neighboring utilities and frequently more competitive nationally.
Competitive "all-in" production costs.
Use of an automatic monthly fuel or purchased power adjustment surcharge for timely recovery of variable energy and fuel costs.
Timely and measured rate increases in anticipation of multiyear capital spending.

Midrange
Authority to set customer or member rates, subject to the approval of an elected city council.
Comparable rates to neighboring utilities, and within range of regional averages.
Use of a fuel or purchased power adjustment surcharge typically adjusted less frequently than monthly.
Well documented rate strategy for servicing capital spending and related debt obligations.

Weaker
Outside regulatory approval required for rate increases.
Political pressure that might limit or postpone needed rate increases, which could ultimately affect a utility's financial metrics.
Above-average rates relative to a peer group, which reduces flexibility for managing unforeseen operating or other capital expenses.
Lack of any fuel or purchased power adjustment factor.

The rates of wholesale power suppliers, including joint-action agencies and generation and transmission cooperatives, and their distribution members are compared at the wholesale and retail levels, respectively.

Rate Competitiveness and Affordability

Fitch analyzes rate affordability with a mixture of qualitative and quantitative factors. While this area typically does not have a significant impact on rating outcomes, Fitch's perception of high or volatile rates, lack of future rate flexibility, or difficulty in obtaining timely rate relief may influence a utility's rating. Fitch believes credit is due to those systems that consistently raise rates to preserve financial strength. However, Fitch believes these activities will be more sustainable when rate affordability is a focus of policymakers and cost containment is regularly employed. Fitch reviews a utility's rates relative to neighboring systems and against service area income levels to gauge rate competitiveness and affordability.

Financial Performance and Legal Provisions

The assessment of a utility's financial performance and policies, and the legal provisions underpinning specific debt issuances, are important considerations in Fitch's rating process. Fitch reviews five years of audited financial statements for an established utility to understand its historical trends and competitive position relative to a peer group. A utility's operating results, liquidity levels, and capital structure are evaluated. Financial projections, including planning assumptions for load growth, rate increases, and expenses, are likewise critical to the rating process. Fitch also examines the financial profiles of a wholesale power provider's members as necessary, to the extent that information is available.

Financial Performance

Fitch's analysis of financial metrics focuses principally on three core areas: cash flow, liquidity, and capital structure. No single financial ratio stands apart from the rest. On the contrary, the ratios are examined together, providing a context for a utility's financial position that informs a complete analysis.

Cash Flow

Cash flow indicators, particularly as they pertain to debt service coverage, provide a measure of financial cushion to meet obligations to bondholders. Fitch primarily considers two measures of debt service coverage to compare utilities that own generation versus purchase power. The standard debt service coverage ratio measuring funds available for debt service to total debt service applies to all utilities. An adjusted measure of debt service coverage, primarily for retail systems that own little or no generation, treats a percentage (30%) of purchased power costs as a debt-like obligation. Thirty percent is an approximation based on historical experience for that portion of off-balance sheet obligations that might otherwise be a fixed expense. The ratio provides a more conservative estimate of financial margin and facilitates comparison with systems that own generation.

Key Financial Ratios

Ratio	Calculation	Significance
Cash Flow		
FADS ($)	Operating Revenues–Operating Expenses+Depreciation+Interest Income[a]	Provides a measure of cash flow from operations.
Debt Service Coverage (x)	FADS/Total Annual Debt Service	Indicates the margin available to meet current debt service requirements.
Coverage of Full Obligations (x)	(FADS+Fixed Charge–General Fund Transfer and/or PILOT)/(Total Annual Debt Service+Fixed Charge)[b]	Indicates the margin available to meet all debt service and other fixed obligations.
Debt/FADS (x)	Total Debt/FADS	Indicates the size of debt compared to the margin available for debt service.
Liquidity		
Days Cash on Hand	Unrestricted Cash and Cash Equivalents/(Operating Expenses–Depreciation)x365	Indicates financial flexibility, specifically cash and cash equivalents, relative to expenses.
Days Liquidity on Hand	(Unrestricted Cash and Cash Equivalents+Available Lines of Credit and Commercial Paper Capacity)/(Operating Expenses-Depreciation)x365	Indicates financial flexibility, including all available sources of cash and liquidity, relative to expenses.
Capital Structure		
Equity/Capitalization (%)	Total Equity/Capitalization	Provides a measure of cost recovery, leverage, and additional debt capacity.
Debt Service/Cash Operating Expenses (%)	Total Annual Debt Service/(Operating Expenses+Total Annual Debt Service–Depreciation)	Provides an indication of debt burden relative to cash operating expenses.
Debt/Customer ($)	Total Debt/Total Customers	Provides a measure for relative comparison of leverage.
Variable-Rate Debt/Total Debt (%)	Variable-Rate Debt/Total Debt	Provides context for an issuer's short-term obligations.
Other		
Operating Margin (%)	Operating Margin/Operating Revenues	Provides a measure of operating stability and capacity to manage an increase in debt levels.
Capex/Depreciation and Amortization (%)	Capex/(Depreciation+Amortization)	Indicates whether annual capital spending keeps pace with depreciation.
Free Cash Flow/Capex ($)	(FADS–Total Annual Debt Service–General Fund Transfer and/or PILOT)/Capex	Indicates a utility's ability to internally fund capex.
Net Debt/Net Capital Assets (x)	(Total Debt–Cash and Reserve Funds)/Net Utility Plant	Provides a measure of leverage relative to the book value of physical assets.
General Fund Transfer/Operating Revenues (%)	(General Fund Transfer+PILOT)/Operating Revenues	Indicates the degree to which a utility provides city or county general fund support.

[a]Operating revenues exclude deferrals to and transfers from a rate stabilization fund. [b]Fixed charge – 30% of purchased power expense, which is an approximation of the associated fixed expense. FADS – Funds available for debt service. PILOT – Payment in lieu of taxes.

Wholesale power suppliers often have lower coverage levels than retail systems, as total wholesale costs are passed through to their members on a monthly basis. Fitch reviews a wholesale system's cost structure, rate adjustment, and billing processes to assess the timeliness of cost recovery, given their lower financial coverage metrics.

Liquidity

Liquidity measures, such as days cash on hand and days liquidity on hand, provide an estimate of an issuer's ability to meet uncertain operating or other capital expenses. Public power entities typically carry less cash on the balance sheet than water and wastewater utilities. As such, days liquidity on hand, reflecting any undrawn bank facilities, is an important measure of financial flexibility.

Certain utilities, typically cooperatives, rely heavily on third-party liquidity providers for bank revolvers or lines of credit. Fitch assesses the diversity and credit quality of the liquidity providers, the ability to extend and replace such agreements, and the adequacy and terms of the liquidity support when reviewing these utilities.

Fitch reviews transfers by a utility to the corresponding municipality's general fund to determine if they are formulaic or subject to limitation. Subjective, open-ended transfer policies that allow a local government to affect the liquidity levels of a utility generally increase credit risk. For electric cooperatives, the amount of patronage capital repatriated has similar importance.

Capital Structure

A utility's capital structure, which encompasses the strength of its balance sheet, presents another indication of financial flexibility. More specifically, the equity-to-capitalization ratio measures a utility's ability to grow equity over time.

A rising equity ratio is favorable, as it suggests adequate cost recovery in rates or load growth. A high level of system equity indicates capacity for issuing additional debt to fund future capital needs. Wholesale power providers with equity levels below 10% are likely to be considered financially disadvantaged.

Attributes: Select Financial Metrics (Retail Systems)

Debt Service Coverage (x)	Debt/FADS (x)	Days Cash on Hand	Equity/Capitalization (%)
Stronger			
Coverage of consistently more than 2.0x provides solid cash flow and bondholder protection.	Less than 6x debt to FADS indicates a favorable level of leverage relative to cash flow.	More than 120 days cash on hand indicates solid financial flexibility to meet unforeseen spending needs.	Strong equity levels of more than 40% indicate adequate cost recovery and ample debt capacity for future capital needs.
Midrange			
Many utilities target coverage in the 1.5x–2.0x range.	Ratios in the 6x–9x range indicate a generally balanced level of debt relative to cash flow.	Many utilities target approximately 60–90 days operating cash.	Many utilities maintain 20%–40% equity levels.
Weaker			
Consistently less than 1.5x coverage provides limited cushion for unexpected revenue shortfalls.	Greater than 9x debt without a suitable rationale can indicate a deficient rate structure.	Less than 60 days cash indicates less financial flexibility, but can be adequate if a utility is subject to less cash flow volatility.	Less than 15% and 10% equity is relatively low for retail electric and wholesale systems, respectively.

FADS – Funds available for debt service. Note: The debt and equity ratios above do not reflect off-balance sheet obligations, which apply to retail systems that are participants in joint-action agencies or are part-owners of generation facilities. Fitch reviews adjusted financial ratios to take into account such obligations.

Debt Profile

Fitch's assessment of a utility's debt profile considers the purpose, amount, and structure of its existing debt. Fitch also considers any off-balance sheet obligations such as take-or-pay contracts or interest rate swap agreements for a complete assessment of fixed expense obligations. Future financing plans, including the funding of a long-term capital program, and the renewal and replacement of any bank liquidity facilities, are also important considerations, particularly as they will affect financial metrics.

The amount of hedged or unhedged variable-rate debt an issuer can manage is a function of its operating risk profile; the strength, predictability, and amount of its cash flows; the level of available funds; and its management of interest rate exposure and maturities. Fitch will assess the resiliency of an issuer's financial metrics relative to a peer group when evaluating its ability to manage variable-rate and short-term debt exposure. Higher rated issuers are typically better able to take on a greater percentage of variable-rate debt, as compared with lower rated issuers.

Legal Provisions

Aspects of the Bond Indenture

The legal provisions of a bond indenture or resolution provide a framework for the establishment of funds and, ultimately, the repayment of a debt obligation. Consequently, Fitch analyzes indenture provisions, such as the pledge of revenues, rate covenant, additional bonds test, debt service reserve fund, and flow of funds to determine the relative strength of the security.

Bond covenants are important to overall bondholder protection, though the degree to which they influence a rating varies. The legal provisions take on greater importance the weaker the credit quality, as they are more likely to be tested.

Pledge of Revenues

Fitch does not distinguish between a pledge of gross and net revenues for public power systems, as all systems must fully cover annual operating expenses and debt service from total revenues. A weaker revenue pledge may allow for the inclusion of other available funds as revenues.

Separately, a mortgage interest provides bondholder support via a lien on physical assets, as is typical of cooperatives.

Rate Covenant

The rate covenant provides a minimum level of protection and ensures that a system reliably covers debt service by a certain margin. Fitch views it as an element of financial cushion. Rate covenants with only a 1.0x (sum sufficient) debt service coverage requirement, or those that allow inclusion of other funds in the calculation, are viewed as being weaker.

Additional Bonds Test

The terms of the additional bonds test often mimic the rate covenant. The strongest tests include both a historical and projected debt service coverage test and limit the period for calculating net revenues to the 12 months immediately preceding the issuance of additional debt.

Debt Service Reserve Fund

The incidence of relying on a debt service reserve fund to pay debt obligations is low, given the limited number of public power entities that Fitch rates below investment grade. However, maintaining additional legally restricted, cash-funded reserves is looked upon favorably, particularly for weaker credits. Fitch evaluates those instances where reserve funds have been funded with a surety from a financial guarantor on a case-by-case basis.

Flow of Funds

The flow of funds is fairly standardized, providing for regular deposits to the debt service fund after the payment of operations and maintenance. As such, the flow of funds has little bearing on the rating, except in the uncommon instances when it deviates from the typical arrangement.

Attributes: Select Indenture Provisions

Rate Covenant	Additional Bonds Test
Stronger	
Greater than 1.25x coverage of ADS by net revenues alone.	More than 1.25x coverage of MADS from net revenues. Typically, the test includes both a historical and projected revenue period; the test will have to be met over a consecutive number of months.
Midrange	
Coverage of ADS between 1.10x and 1.25x by net revenues alone.	Coverage of MADS from net revenues of between 1.10x and 1.25x. Might only include a historical or projected net revenue coverage test; might allow inclusion of other available fund balances to meet the test.
Weaker	
Less than 1.10x coverage of ADS by net revenues plus available funds.	Less than 1.10x coverage of ADS from net revenues. Typically, a historical or projected test, with a looser interpretation of the revenue period (i.e. 12 consecutive months of the 24 months preceding the issuance of additional bonds).

ADS – Annual debt service. MADS – Maximum annual debt service.

Wholesale Power Contracts

The power sales contracts between a wholesale power supplier and its distribution customers are among the most important factors supporting the credit rating of a wholesale power system (joint-action agency or cooperative), as the credit strength of a wholesale provider is intrinsically linked to that of its purchasers. A wholesale power supplier would be unlikely to obtain an investment-grade rating absent these long-term agreements, many of which are court validated to provide assurances that they are enforceable.

In particular, Fitch evaluates the nature of the contractual obligation (take-or-pay, take-and-pay, all requirements, etc.) and the expiration and renewal terms of these contracts relative to the final maturity of an issuer's outstanding bonds. Debt maturities beyond the terms of the agreements are considered a negative rating factor, as issuers could be forced to sell power in the open market on a merchant basis to support debt service.

Take-Or-Pay Contracts

Strengths

Long-term commitment of participants to purchase 100% of project output.

Participants are required to make payments regardless of unit operation; many such contracts have been deemed by the state courts as legally binding to the participants.

Contracts can mitigate price volatility risk (for the power purchaser) inherent in short-term purchase power contracts, as the contracts are often for a fixed price plus a modest escalator.

Step-up requirements can mitigate the default risk of the weakest and smallest participants (e.g. with a 25% step up, a default by 25% of participants [by participation] would be borne by the other participants rather than by bondholders).

Weaknesses

Depending on the transaction's structure, the step-up provision can be insufficient to mitigate a default of the weakest participants.

Take-And-Pay Contracts

Strengths

Long-term commitment of participants to purchase 100% of agency output.

Participants are obligated to pay for power that is delivered, whether generated or purchased.

The risk of an individual participant defaulting is, in effect, borne by membership rather than bondholders in the form of higher average wholesale rates set by the agency (e.g. an unlimited step-up provision when "take-and-pay" is coupled with an "all-requirements" power supply contract).

Weaknesses

Participants are only obligated to pay for power that is available. Hence, an agency would lose revenues if it did not deliver power.

Effects of Litigation

Fitch considers any litigation that might result in financial payments in its review of an issuer's legal framework. Any such payments that materially affect an issuer's balance sheet could result in a negative rating action.

Customer Profile and Service Area

Service area characteristics provide an indication of the stability of a constituency's load, and ultimately its ability to pay electric bills. Stronger electric systems typically serve growing, well-

Key Service Area Metrics

Indicator	Source	Significance
Economic Factors	U.S. Bureau of Labor Statistics and U.S. Bureau of Economic Analysis.	A diversified economy is typically better positioned to absorb cyclical changes than an economy concentrated in a certain sector, providing for greater stability of revenues.
Customer Profile (breakdown of residential, commercial, and industrial customers)	Utility or consultant.	A higher percentage of residential energy sales (more than 40%) typically provides for greater financial stability. Residential customers each account for very small percentages of total sales. As such, the loss of any single customer does not disrupt a utility's revenue stream.
Top 10 Customers	Utility or consultant.	As a percentage of the total, 5% of sales to the largest customer or 25% of sales to the 10 largest customers reveals concentration in the revenue base, which can be disruptive if a large customer(s) leaves the area.
Population	U.S. Census.	A growing service area typically leads to additional energy sales, in support of revenues.
kWh Sales (breakdown of residential, commercial, and industrial sales)	Utility or consultant.	The trend of kWh sales provides an indication of the health of the local economy, with steady annual increases demonstrating sound economic and population growth.
Unemployment Rate	U.S. Bureau of Labor Statistics.	Provides an indication of the relative depth of a local employment base.
Income Levels	U.S. Census and U.S. Bureau of Economic Analysis.	Provides an indication of the relative ability to pay.

diversified areas. However, the essential nature of electric service and the remedies available to most public power providers (e.g. shutoffs and liens) make payment delinquencies in the sector extremely low, regardless of wealth and other economic indicators.

Service Area Considerations

A utility's ability to maintain a sound operating position, despite changing service area characteristics, is an important rating consideration. Some of the factors Fitch considers in its assessment of a service area are shown in the Key Service Area Metrics table on page 12.

Fitch performs a more detailed analysis of an electric system's customer base to further evaluate the stability of the revenue source when there is industry or customer concentration. The latter is defined as one or a few large customers accounting for a material proportion of revenues (e.g. an individual customer accounting for more than 5%, or the top 10 accounting for more than 25% of the system's operating revenues). Fitch also conducts an analysis of all relevant member information when reviewing joint-action agencies and cooperatives as necessary, to the extent that information is available.

Key Rating Considerations

Governance and Management Strategy

- Type of governing body
- Management's relationship with governing body
- Management's experience and depth of industry knowledge
- Business strategy and planning
- Management's track record at achieving financial and strategic goals
- The relationship among the members, for joint-action agencies and cooperatives

Assets and Operations

- Review of generation mix and comparison to the region
- Historical operating performance of generation facilities
- Relative load balance or shortfall, and plans for meeting additional power needs
- Environmental concerns and compliance
- Fuel supply and hedging contracts
- Off-system power sales/purchases
- Distribution and transmission issues

Cost Structure

- State or federal regulatory oversight
- Rate-raising flexibility and competitiveness
- Process of adjusting rates to ensure timely and adequate cost recovery
- Structure and use of fuel or purchased power adjustment mechanism
- Generating plant production costs relative to similar plants in the region
- Average total power supply cost relative to a peer group
- Average wholesale cost of power, for joint-action agencies and cooperatives
- Average retail rates by customer classification and comparison to peers

Financial Performance and Legal Provisions

- Management's financial policies
- Historical five-year analysis of key cash flow, liquidity, and leverage ratios
- Financial projections and reasonableness of key assumptions
- Existing debt characteristics and future financing needs
- Financial analyses of the largest member distribution systems, for joint-action agencies and cooperatives
- Review of indenture provisions and bond security features
- Type, length, and renewal terms of wholesale power contracts
- Any material pending litigation

Customer Profile and Service Area

- Economic and demographic makeup and trends
- Customer composition, including a breakout of kWh sales and revenues
- Customer revenue or business sector concentration
- Service area profiles of member systems, for joint-action agencies and cooperatives

Table 4 Historical and Proposed Capital Improvement Program Expenditures
(Thousands of Dollars)

	Fiscal Year Ending August 31,[a]											
	Actual					Estimate	Budget	Projected				Total
Category	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2016 - 2020
	$	$	$	$	$	$	$	$	$	$	$	$
Gas Processing	7,905	4,077	3,675	3,095	5,350	3,651	5,541	8,873	7,591	4,822	2,690	29,517
Distribution	41,554	44,736	44,751	57,394	61,768	64,116	77,782	84,713	89,467	88,885	88,219	429,066
Field Services	3,695	2,364	3,441	3,727	5,393	5,984	6,705	6,104	6,918	7,140	7,306	34,173
Fleet Operations	2,290	2,670	1,552	1,111	2,233	4,795	8,240	5,559	3,179	1,925	1,030	19,933
Other Departments [b]	3,515	4,979	3,713	7,048	8,587	11,781	12,484	2,410	2,607	2,357	2,370	22,228
Subtotal	58,959	58,826	57,132	72,375	83,331	90,327	110,752	107,659	109,762	105,129	101,615	534,917

(a) All figures are net of Salvage, Reimbursements, and Contributions.

(b) Includes Approved and Budgeted Program for Building Services, Customer Affairs, Information Technology, and Systems Technology.