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Our Energy...Your Power

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Tishekia E. Williams
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August 4, 2015

Via Overnight Delivery

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

Re: Petition of Duquesne Light Company for Approval to Modify its Smart Meter Procurement and Installation Plan
Docket No. M-2009-2123948
P-2015-_____

Dear Secretary Chiavetta:

Enclosed for filing, please find the *Petition of Duquesne Light Company for Approval to Modify its Smart Meter Procurement and Installation Plan.* A copy of the Duquesne Light Company's ("Duquesne Light" or "Company") Amended Smart Meter Deployment Plan is enclosed with the Petition and marked as Appendix A. Also included are the direct testimony of Brian Novicki, Duquesne Light Statement No. 1; the direct testimony of James Karcher, Duquesne Light Statement No. 2; and the direct testimony of William Pfrommer, Duquesne Light Statement No. 3. In light of the updates provided in this filing, please note that the Company is not filing a separate annual smart meter implementation status update. Copies of this filing have been served as indicated on the certificate of service.

Should you have any questions, please do not hesitate to contact me at 412-393-1541.

Respectfully Submitted,

Tishekia E. Williams
Senior Counsel, Regulatory

Enclosures

cc: Certificate of Service
Michael W. Gang, Esq. (via email)
Anthony D. Kanagy, Esq. (via email)

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of Duquesne Light Company	:	
For Approval to Modify its Smart Meter	:	Docket No. M-2009-212394
Procurement And Installation Plan	:	P-2015-

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PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

PETITION OF DUQUESNE LIGHT COMPANY TO MODIFY ITS SMART METER PLAN

I. INTRODUCTION

Pursuant to 52 Pa. Code § 5.43, Duquesne Light Company ("Duquesne Light" or the "Company") hereby files its Petition for Approval to Modify its Smart Meter Procurement and Installation Plan. The Pennsylvania Public Utility Commission ("Commission") approved Duquesne Light's *Final Smart Meter Procurement and Installation Plan*, ("2012 Smart Meter Plan") with certain modifications by Order entered May 6, 2013. Since then, the Company has made significant progress implementing its 2012 Smart Meter Plan. To date, the Company has deployed approximately 70,000 smart meters that are capable of bi-directional communication, remote meter reprogramming, and providing hourly usage and consumption data. Duquesne Light has also installed 133 LAN Data Aggregation Points ("DAPs") and 13 WAN towers.[1]

The Company also conducted a study of the costs and benefits of implementing enhanced outage communications and voltage monitoring capabilities. Based on the results of the study, the Company is proposing to implement enhanced outage communication and voltage monitoring capabilities as a part of its Amended Smart Meter Deployment Plan and recover the associated costs through the Smart Meter Charge.

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[1] The DAP is the device used to collect the data from the Itron Smart Meters in an area or neighborhood over the Local Area Network ("LAN") and transmit it through the Wide Area Network ("WAN") back to the Head End Data Collection Engine. The Head End Data Collection Engine was placed into service in June 2015, along with the Meter Data Management ("MDM") system and the Smart Grid Gateway ("SGG"), enabling bi-directional communication and full interrogation capability of deployed AMI meters, including processing of the data for billing and presentment.

The proposed amendments to the Company's 2012 Smart Meter Deployment Plan are based upon the analysis and experience gained by Company over the past several years. A copy of the Company's Amended Smart Meter Deployment Plan ("Amended Smart Meter Plan") is provided with this Petition as Appendix A. Also included is the direct testimony of Brian Novicki, which details the proposed changes to the Advanced Metering Infrastructure ("AMI") project and associated costs (Duquesne Light Statement No. 1); the direct testimony of James Karcher, which details the results of the Company's outage communication and voltage monitoring study and provides an overview of the implementation timeline or "Roadmap" to install an Advanced Distribution Management System ("ADMS") and associated costs (Duquesne Light Statement No. 2); and the direct testimony of William Pfrommer, which details the Company's cost recovery proposal (Duquesne Light Statement No. 3). For the reasons explained herein, Duquesne Light's Amended Smart Meter Plan is in the public interest and should be approved.

II. BACKGROUND

1. Duquesne Light is a public utility as that term is defined under Section 102 of the Public Utility Code, 66 Pa. C.S. § 102, certificated by the Commission to provide electric service in the City of Pittsburgh and in Allegheny and Beaver Counties in Pennsylvania. Duquesne Light is also an electric distribution company ("EDC") and default service providers ("DSP") as those terms are defined under Section 2803 of the Public Utility Code. 66 Pa. C.S. § 2803. As of June 30, 2015, Duquesne Light provides electric distribution service to approximately 587,839 customers and is currently the DSP for approximately 381,930 of those customers.

2. Duquesne Light's attorneys are:

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Duquesne Light's attorneys are authorized to receive all notices and communications regarding this proceeding.

3. On November 14, 2008, Act 129 of 2008, P.L. 1592 ("Act 129") became effective. Act 129 required electric distribution companies ("EDCs") to implement multiple programs to promote energy efficiency and conservation by electric customers. In addition, Act 129 required EDCs to file smart meter plans within 9 months after the effective date of the Act. On June 24, 2009, the Commission issued its *Implementation Order*.[2] In the *Implementation Order*, the Commission established the standards that EDCs must meet for providing smart meter technology to customers and also provided guidance for meeting those standards.

4. Following the issuance of the Commission's *Implementation Order*, Duquesne Light made a series of milestone filings which detailed the status and incremental progress in the Company's Smart Meter Deployment Plan.

[2] *Smart Meter Procurement and Installation*, Docket No. M-2009-2092655, *Implementation Order* entered June 24, 2009 ("*Implementation Order*").

5. On August 14, 2009, Duquesne Light filed its Initial Smart Meter Plan that provided a description of its current metering system, (2) explained how it would address customer requests for smart meters and installation of smart meters in new construction during the grace period, (3) explained its network development and installation plan within the 30 month grace period, (4) proposed a milestone and status reporting schedule during the grace period, and (5) proposed a cost recovery mechanism for recovering smart meter costs.

6. On May 11, 2010, the Commission entered an Order approving Duquesne Light's Initial Smart Meter Plan, with certain modifications. The Commission approved Duquesne Light's proposal to recover its smart meter costs through a reconcilable cost recovery mechanism, and set forth the details of how this mechanism would work.

7. On July 1, 2010, the Company filed a Cost Benefit Analysis for the additional smart meter capabilities identified in the Implementation Order. Therein, the Company provided an evaluation of the costs to implement each of the nine additional smart meter capabilities identified in the Implementation Order, the potential benefits of implementing these additional capabilities and the Company's recommendations regarding whether it should implement these additional capabilities.

8. On December 29, 2010, Duquesne Light filed its Application for Approval of Assessment of Needs, Technology Solutions and Vendor Selection ("Assessment Application"). In the Assessment Application, the Company provided a detailed assessment of AMI technology requirements, possible solutions and selection of technologies and vendors. On January 31, 2011, the Company filed a Supplement to its Assessment Application. In the Supplement, Duquesne Light identified Itron, Inc. ("Itron") as its recommended primary contractor to design, construct, implement and oversee the Company's Smart Meter program.

9. On March 31, 2011, the Company filed its Establishment of Network Design for the Duquesne Light Smart Meter Program ("Network Design") with the Commission. Therein, the Company explained that it had conducted a study to review the Company's existing communication infrastructure, review network and communication infrastructure necessary for the AMI and also review available private and public written communications solutions. The initial Network Design conclusions supported the use of private wireless options as the primary communication methodologies, with public wireless as a backup communication.

10. On October 6, 2011, the Company filed an Installation, Testing and Rollout of Support Equipment and Software Update filing. The primary purpose of the October 6 update filing was to outline the equipment testing that the Company planned to conduct prior to deploying smart meters across its service territory.

11. On November 2, 2011, the Company filed a status update related to its Establishment of Plans for Installation of Meters and Outside Communications and Training. On November 18, 2011, the Company filed a status update with respect to its Initial Smart Meter Plan and further requested a six month extension, from December 31, 2011 to June 30, 2012, to file the Company's Final Smart Meter Plan. On December 13, 2011, the Commission issued a Secretarial Letter granting the Company's request for an extension, until June 30, 2012, to file its 2012 Smart Meter Plan.

12. On June 29, 2012, the Company filed a Petition for Approval of its Smart Meter Deployment Plan. Included with the Petition was a copy of the 2012 Smart Meter Plan and direct testimony of David Wolfe, Peter Honebein and William Pfrommer. These documents detailed the Company's plans to replace its Advanced Meter Reading ("AMR") system with AMI and deploy smart meters over a seven year period from 2014-2020. As detailed in the 2012 Smart Meter Plan,

Duquesne Light's Advanced Metering Infrastructure ("AMI") project includes four components: 1) Itron Smart Meters, 2) LAN, 3) WAN, and 4) the Head-End Collection System. The Plan also provided a phased in approach to implementing the functionality required by Act 129 and the Commission's *Implementation Order.*

13. Following extensive investigation by interested stakeholders, on December 7, 2012, Duquesne Light and the Office of Consumer Advocate filed an uncontested Joint Petition for Approval of Full Settlement ("Joint Petition"). On January 24, 2013, Administrative Law Judge Katrina Dunderdale issued an Initial Decision approving the Joint Petition.

14. On May 6, 2013, the Commission entered an Opinion and Order ("May 6 Order") in part granting approval of and modifying the 2012 Smart Meter Plan and the Joint Petition. In the May 6 Order, the Commission directed Duquesne Light to make a compliance filing within ninety (90) days of the date of entry of the May 6 Order providing data supporting whether or not inclusion of the voltage monitoring and communication of outages and restorations capabilities are cost effective, among other things.

15. On August 2, 2013, Duquesne Light submitted its Compliance Filing. In its Compliance Filing, Duquesne Light proposed to initially evaluate Volt/VAR optimization, outage notification, and transformer loading capabilities. The Company explained that Voltage/VAR optimization can reduce line loss inefficiencies by optimizing reactive power flow and improving the PF (Power Factor) of the electrical distribution system thereby decreasing the amount of current flow necessary to meet customer load demand. Outage notification using AMI data together with a compatible Outage Management System ("OMS") will provide better diagnostics and control of abnormal conditions during power outages. This would allow power outage restoration to be completed faster than before and would increase reliability of the electrical

distribution system. The system would provide proactive communications with customers affected by a power disruption. Finally, transformer load monitoring capability can minimize outages caused by overloading transformers during peak demand periods. No parties filed comments to the Company's Compliance Filing.

16. Duquesne Light proposed to execute a multi-year and multi-million dollar investment project to install a new OMS that is capable of sharing data with AMI, and to perform electrical modeling of the distribution system.

III. MODIFICATIONS TO THE 2012 SMART METER PLAN

A. Meter Functionality

17. The Company's Amended Smart Meter Plan delivers all functionality required by Act 129 and the Commission's *Implementation Order*. Pursuant to Act 129, EDCs are required to implement and deploy smart meter technology with six minimum capabilities that include:

- Bidirectional communication ability;
- The ability to record electric usage at least hourly;
- The ability to provide customers access to use and price consumption information;
- The ability to directly provide customer with hourly consumption information;
- Enable Time of Use ("TOU") and Real Time Pricing ("RTP") programs;
- Support automatic control of customer usage.[3]

18. The Commission's *Implementation Order* further directed EDCs to consider implementing nine additional capabilities if such measures are cost effective. Those capabilities include:

- Remote connect and disconnect ability;
- Providing 15 minute interval data;
- Onboard meter data storage;

[3] *Implementation Order*, pp. 29-30.

- Open Standards and protocols;
- Ability to upgrade minimum capabilities;
- Ability to monitor voltage at each meter;
- Remote reprogramming ability;
- Communicate outage and restoration information.[4]

19. Duquesne Light's Commission approved 2012 Smart Meter Plan provides a phased in approach to implementing the functionality required by Act 129 and the *Implementation Order*. Specifically, the Company's 2012 Smart Meter Plan provides the following functionality implementation schedule:

ACT 129 & *IMPLEMENTATION ORDER* FUNCTIONALITY	**2014**	**2015**	**2016**	**2017**
Bidirectional communication	X			
Records usage data on an hourly basis	X			
Direct access to price and consumption information				X
Provide customers with their hourly consumption		X		
Enable TOU rate programs		X		
Enable real time pricing programs		X		
Automatic control of customer electric consumption				X
Remote connect and disconnect			X	
Provide 15 minute or shorter interval data			X	
Onboard meter storage that complies with national standards	X			
Open standards and protocols	X			
Upgradeable capabilities	X			

[4] *Implementation Order*, p. 30.

Outage communication and voltage monitoring[5]				X
Remote reprogramming of the meter	X			
Net metering of customer generators		X		

20. With the exception of net metering and TOU/RTP, the Company has implemented all of the scheduled 2014 and 2015 functionalities. Pursuant to the Joint Petition, the Company will also implement vulnerability testing across AMI and Green Button compliance in 2015.

21. In its Amended Smart Meter Plan, the Company proposes to implement the TOU, RTP and net metering functionalities in 2016 as opposed to 2015.[6] Bill ready functionality will be implemented in 2016 as well.

22. The Company will not be able to deploy the TOU and RTP functionalities in 2015 because it has prioritized other business and regulatory requirements such as Off-Cycle Switching.

23. With regards to net metering, the Company believes that it is reasonable to postpone implementation of this functionality (through the smart meter network) until 2016 in order to prioritize implementation of other regulatory and business requirements that impact customers and electric generation suppliers ("EGSs"). Duquesne Light will continue to offer net metering functionality to its customers using existing technology (via dual meters). Accordingly, postponing implementation of this functionality through the AMI system, as opposed to the existing AMR system will not impact Duquesne Light's customers.

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[5] In the 2012 Smart Meter Plan, the Company proposed limited outage communication and voltage monitoring functionalities. In this filing, the Company is proposing to implement the ADMS to provide enhanced outage communication and voltage monitoring functionalities which are estimated to be fully deployed by 2021.

[6] In a recent Order, the Commission approved the Company's proposal to implement a TOU Program to become effective June 1, 2016. *Petition of Duquesne Light Company for an Extension of Time or Waiver to Meet Certain Regulatory Requirements*, Docket No. P-2015-2484590, order entered July 30, 2015. The Company is undertaking a collaborative to determine the rules for the TOU Program to become effective June 1, 2016, and will file a TOU proposal with the Commission.

24. Details of the AMI functionality and implementation schedule are included in the direct testimony of Mr. Brian Novicki included with this Petition as Duquesne Light Statement No. 1.

B. Outage Communication and Voltage Monitoring

25. As explained in ¶15 herein, the Company submitted a Compliance filing which described its preliminary plan to further evaluate outage communication and voltage monitoring capabilities. The Company explained that it conducted a Request for Information ("RFI") to solicit information from outside consultants to independently evaluate the implementation of the AMI system upgrades related to outage communication and voltage monitoring. The consultants that responded to the RFI preliminarily projected AMI upgrade cost estimates ranging from $22-$44 million. They further estimated that associated cost saving, over a 20 year period, ranged from $120-$250 million. The costs and cost savings provided were preliminary until a detailed study of the Duquesne Light's distribution system could be completed.

26. The Company further explained that it expected to develop and execute the potential outage communication, restoration, and voltage monitoring capability plan in three phases:

- Phase I – Perform a detailed study of distribution operation processes and technology, data collection for electric distribution modeling, and issue a more specific scope of work/roadmap which will include more refined cost-benefit analyses.
- Phase II (June 2015 to June 2018) – Expected to focus on advanced outage capabilities.

- Phase III (January 2018 to December 2020) – Expected to focus on distribution monitoring and control applications.[7]

27. Subsequently, the Company issued a Request for Proposal ("RFP") to conduct a comprehensive study of the costs and benefits of implementing enhanced outage communication and voltage monitoring capabilities based on the specific attributes of Duquesne Light's distribution system. The Company received two responses to the RFP that included refined functionality and associated cost-benefit analyses. The Company chose DNV GL as the vendor to complete the study.

28. Based on the results of the Phase I Study, Duquesne Light proposes to implement an Advanced Distribution Management System ("ADMS") to achieve enhanced outage communication and voltage monitoring capabilities. ADMS is an integrated system with a common user interface that provides the operator with the ability to analyze the distribution network and includes outage management functionality, Supervisory Control and Data Acquisition ("SCADA") functionality and Advanced Distribution Applications functionality such as real time load flow analysis, Volt/VAR Optimization, Fault Analysis, and switching order solutions.

29. Implementation of an ADMS is a multi-year and multi-million dollar project that will improve accuracy, timeliness and consistency of outage and restoration information provided to customers and stakeholders. The system is also expected to reduce manual outage analysis, response times and customer outage duration. ADMS also provides enhanced load balancing, fault location isolation, service restoration, interactive Volt/VAR optimization and voltage regulation and conservation.

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[7] *Smart Meter Procurement and Installation*, Docket No. M-2009-2123948, *Smart Meter Procurement and Installation Compliance Filing* dated August 2, 2013 ("*Compliance Filing*").

30. As explained its Compliance filing, the Company must implement certain foundational systems to achieve the proposed functionality. First, the Company must develop an electrical model. An electrical model is necessary as it connects the customer to the grid and models the electrical connectivity from the substation breaker all the way to the meter.

31. Additionally, the Company must replace its current OAS[8] with an Outage Management System ("OMS"). An OMS uses the electrical model to automatically determine what protective device has operated during a power outage and then automatically groups all customers affected by this device together.

32. Finally, the Company proposes to implement Advanced Distribution Applications to deliver enhanced load balancing, fault location isolation service restoration, interactive Volt/VAR optimization and voltage regulation and conservation. The Company proposes to implement outage communication and voltage monitoring functionality as follows:

Systems	2019	2020	2021
Electrical Model (beginning 2015)	X		
OMS (beginning 2016)		X	
ADMS (beginning 2019)			X

33. It should be noted that the Company continues to evaluate methods to achieve enhanced outage communication and voltage monitoring while minimizing costs. Such alternatives may result in lesser functionality, but would allow the Company to provide better outage restoration information to customers and third party stakeholder, as well as reduce the

[8] Duquesne Light has an Outage Analysis System ("OAS") that is used to track emergency trouble calls, provides a means to manually group these calls to protective devices, and enables real time updating of the interactive voice response ("IVR") with useful outage information for customers.

duration of customer of outages. Further details regarding the outage communication and voltage monitoring functionality and implementation schedule are included in the direct testimony of Mr. Karcher, Duquesne Light Statement No. 2 which is provided with this Petition.

i. Cost-Benefit Analysis

34. Based on the results of the Phase I Study, Duquesne Light believes that the benefits of implementing an ADMS to deliver outage communication and voltage monitoring exceed the expected implementation costs. An ADMS combines OMS, SCADA, and Distribution Management System (DMS) functionality including real time load flow analysis, Volt/VAR Optimization, Fault Analysis, and switching order solutions. The Commission's *Implementation Order* directs that EDCs deploy smart meter technology that supports the ability to monitor voltage at each meter and report data in a manner that allows the EDC to react and communicate outage and restoration information, among other things. *Implementation Order*, p. 30. The *Implementation Order* further provides that EDC plans must detail any incremental cost associated with this functionality. The cost should include a breakdown of cost and potential operational and maintenance cost savings for functionality and configuration. *Id.* The Company believes that the customer benefits of implementing the proposal detailed herein outweighs the costs that will be borne by customers.

35. The total estimated cost of implementation of the ADMS is $46M-$56M. The estimated cost includes $42.2M-$51.6M for implementation of OMS and $3.8M-$4.4M incremental costs for implementation of the DMS portion of the ADMS. Based on the results of the Phase I Study, the ongoing incremental annual costs to operate and maintain ADMS from implementation is $2.8M per year. Ongoing costs include software maintenance and support fees, periodic hardware replacement, and incremental Duquesne Light support staff.

36. As explained in the direct testimony of Mr. Karcher, there are three basic categories of potential benefits of outage communication and voltage monitoring: 1) economic, 2) reliability and power quality, and 3) safety. Duquesne Light believes that the expected combined benefits justify implementation.

37. Based on the results of the Phase I Study, the estimated quantifiable economic benefits of implementing ADMS total $46.3M over a 20 year period. This does not include the estimated societal (non-rate benefits) benefit of $6.0 million per year.

38. Implementing the OMS is limited in the quantifiable economic benefits that can be captured with precision. Savings will be seen as a result of the efficiencies achieved in managing outages during storm events. The system will require fewer resources to assess and manage outages, resulting in reduced labor needed to support storm restoration. The system will also require fewer labor resources to assemble data for post-storm reporting. The total savings due to storm and post storm reporting efficiencies is estimated to be as much as $50k in the first year and $100k going forward. During non-storm periods, the number of call taken by customer service representatives is expected to be reduced requiring less labor resources. The total savings due reduced call volume is estimated to be as much as $50k in the first year, $100k in the second year and $200k going forward.

39. Using an OMS with information provided by smart meters has the potential to reduce restoration time and avoid a significant number of truck rolls to outage locations where the outage had previously been restored during restoration events caused by very large storms which historically occur approximately once every 3-5 years at Duquesne Light. Typically near the end of large storms, a large amount of single outage tickets exist that did not get properly grouped into larger outages. If a customer cannot be reached to confirm if the outage has been restored or not,

then a crew must be dispatched to the location. Smart meter ping results will accomplish this verification without dispatching a trouble shooter or crew (truck roll).

40. Implementing the Distribution Management System DMS portion of the ADMS is the primary driver behind the incremental benefits of the ADMS project. The following table provides an overview of the economic benefits to be achieved and the year the benefit is expected:

Description	**2019**	**2020** $'000	**2021** $'000	**2022** $'000	**2023** $'000	**2024** $'000
Customer Service (Reduced Call Volume		$50	$100	$200	$200	$200
Storm Efficiency (Support, Reporting, and Truck Rolls)[9]		$50	$100	$100	$100	$100
Asset Management (Transformer Loading)			$100	$200	$285	$285
Capacity Demand (Volt/VAR)\			$500	$1,000	$2,000	$2,000

41. In order to track reductions in operations and maintenance expenses resulting from implementation of the ADMS, the Company proposed to evaluate its current storm management team and post storm reporting labor expenses to establish a baseline from which savings can be measured. Upon implementation of the ADMS, the Company will track costs of the storm management team and the post storm reporting labor to determine actual savings that will be returned to customers. The savings included herein are estimates based on the analysis performed by industry experts and the experience of other utilities which may have different distribution systems.

[9] These numbers exclude potential large storms which are expected to produce significantly more savings depending on the severity and duration of the event. These savings are not able to be reasonably quantified at this time.

42. In addition to economic benefits, the ADMS implementation has the potential to deliver additional benefits for which the monetary value is difficult to estimate with precision. Examples of such expected benefits include:

- Improved safety by providing the ability for all Duquesne Light employees using the OMS to see the "As-Is" state of the distribution network;
- Improved ability to generate an accurate list of customers affected by a tripped device;
- Enhanced customer satisfaction from proactive restoration communications (calls, texting, emails) during trouble and more accurate restoration estimate updates;
- Improved outage notification and reporting with stakeholders including regulatory entities and media;
- Customer Benefits, including reducing the consumer cost of an outage at a value to DLC's customers of approximately $6,000,000 a year.

Mr. Karcher provides further details regarding cost-benefit analysis in Duquesne Light Statement No. 2 which is enclosed herein

C. Meter Deployment

43. The Company's Commission approved 2012 Smart Meter Plan provides a seven year meter installation schedule for all customers. Under this schedule, the Company planned to utilize a two-year ramp up period followed by full deployment over the next five years. The planned ramp up period began with a 5,000 smart meter roll-out in 2014 followed by a gradual build up to a full deployment by the end of 2020. Duquesne Light proposes to deploy smart meters to all residential customers over a five year period, and commercial and industrial customers over a 6 year period. Under this proposal, all residential meter installations will be completed by 2018 and commercial and industrial meter installations will be completed by 2019. The Commission's *Implementation Order* provides "Act 129 uses the language "not to exceed 15 years." An EDC is

encouraged to expedite the deployment process if it will provide increased customer benefits in a cost-effective manner. Again, the primary goal of the EDC deployment plan should be to implement a deployment and installation schedule that best balances the overall efficiency and timeliness of the smart meter installations with the costs incurred." Accelerating the smart meter deployment schedule as proposed is cost neutral and enables the Company to offer the enhanced capabilities and functionalities available from the Company's system to our customers sooner. Roughly 84,000 smart meters will be installed and delivering benefits such as remote connect disconnect functionality and high bill alerts more quickly under the accelerated deployment schedule.

D. Overall AMI Implementation Costs

44. The total estimated cost of Duquesne Light's Amended Smart Meter Plan is $257 million, exclusive of the ADMS. A high level overview of the estimated spending for the various components of the Smart Meter Program is provided in the table below:

Scope Component ($ millions)	**Operating**	**Capital**	**Total**
AMI Project	55	185	240
AMI Run Operations	10	0	10
Bill Ready Functionality	2	5	7
ADMS	22-26	24-30	46-56
ADMS Run Operations	5-6	0	5-6
Total	**99**	**220**	**319**

A further explanation of the estimated project costs and bill ready functionality is included in Mr. Novicki's direct testimony.

45. The Company notes that the total estimated project cost does not include a general project contingency component, which is typical for projects of this nature with four years of project implementation ahead of it. The Company will strive to complete the AMI project based on the estimated costs as set forth above. However, the Company also requests Commission approval of a $15 million contingency component to cover changes in scope or requirements, unforeseen cost increases or implementation complications. If such contingent circumstances arise, the Company proposes to inform the Commission of such circumstances and include the contingent costs in the SMC, subject to Commission review and refund.

46. AMI costs have increased from the 2012 Smart Meter Plan for several reasons, including increased hardware/software costs, increased costs for Company labor, increased systems integration costs and increased costs for outside services. Additional details are provided in the Direct Testimony of Mr. Novicki, Duquesne Light Statement No. 1, and in the Amended Smart Meter Plan.

F. Customer Repairs

47. Under the Amended Smart Meter Plan, Duquesne Light requests Commission approval to make the necessary repairs to a customer's service entrance equipment that are necessary to allow the safe installation of the new AMI meter. Repairs will be limited to ensuring a safe and serviceable meter socket, and include repair and replacement of adjoining equipment only when necessary to ensure a safe and serviceable meter socket for the AMI meter installation. Performing these repairs in a timely and controlled manner is essential to the integrity of the network, by ensuring gaps in the mesh do not exist that would prevent stable and consistent meter communications. Duquesne Light proposes to recover these costs through the smart meter charge.

E. AMI Cost Recovery

48. The Commission addressed AMI cost recovery issues in its May 11, 2010 Order approving the Company's Initial Smart Meter Plan.

49. The Company proposes to continue to recover its AMI costs, including costs to implement ADMS, under the Smart Meter Charge Rider approved by the Commission, as set forth in the May 11, 2010 order and as implemented by the Company. Additional details are provided in the amended Smart Meter Deployment Plan and in the direct testimony of Mr. Pfrommer., Duquesne Light Statement No. 3.

III. CONCLUSION

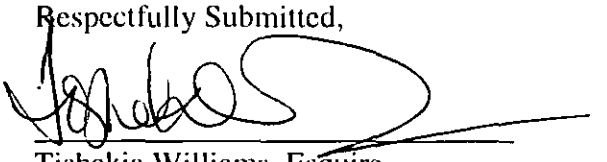
WHEREFORE, for all of the foregoing reasons, Duquesne Light Company respectfully requests that the Pennsylvania Public Utility Commission:

(1) Approve this Petition;

(2) Find that the Company's Amended Smart Meter Plan fully complies with Act 129 and the Commission's *Implementation Order*; and

(4) Grant any waivers that may be necessary, if any, for Duquesne Light to implement its Amended Smart Meter Plan, as filed.

Respectfully Submitted,



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Date: August 4, 2015

Attorneys for Duquesne Light Company

APPENDIX A

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

DUQUESNE LIGHT COMPANY AMENDED SMART METER TECHNOLOGY *PROCUREMENT AND INSTALLATION PLAN*

Docket No. M-2009-2123948
P-2015-_____

Date: August 4, 2015

PLAN FORMAT

I. EXECUTIVE SUMMARY

Duquesne Light Company ("Duquesne Light" or the "Company") filed its Initial Smart Meter Procurement and Installation Plan ("Initial Smart Meter Plan") with the Pennsylvania Public Utility Commission ("Commission") on August 14, 2009. As part of the Initial filing, Duquesne Light received Commission approval to upgrade its customer information system and install a meter data management system. This project is known as the FOCUS Project. The new and replacement systems under the FOCUS Project were necessary in order for Duquesne Light to provide smart meter technology to customers. In addition, Duquesne Light received Commission approval to further develop a Final Smart Meter Procurement and Installation Plan to be filed with the Commission by December 31, 2011. This date was subsequently extended to June 30, 2012 upon the request of the Company ("2012 Smart Meter Plan").

This filing constitutes Duquesne Light's Amended Smart Meter Plan. In this Amended Smart Meter Plan, Duquesne Light is proposing the following revisions to its 2012 Smart Meter Plan that was approved by the Commission:

(1) To accelerate residential meter deployment by one year, and commercial meter deployment by one year;

(2) To modify the schedule for implementing certain smart meter functionalities;

(3) To implement an Advanced Distribution Management System ("ADMS") to achieve enhanced outage communication and voltage monitoring capabilities; and

(4) To update smart meter plan cost estimates.

As explained herein, Duquesne Light's Amended Smart Meter Plan will continue to meet all of the requirements of Act 129, the additional requirements set forth in the *Implementation Order* and provides smart meter technology to customers in a cost-effective manner. *Smart Meter Procurement and Installation*, Docket No. M-2009-2092655, *Implementation Order* entered June 24, 2009 ("*Implementation Order*").

Duquesne Light Company –Amended Smart Meter Plan

Under Duquesne Light's Amended Smart Meter Plan, Duquesne Light proposes to deploy Smart Meters to customers over a six-year period as opposed to the seven-year period proposed in the 2012 Smart Meter Plan. This includes a one-year ramp up period in 2014, with full deployment of smart meters across the Company's service territory by 2019. Accelerating the smart meter deployment schedule enables the Company to offer the enhanced capabilities and functionalities available from the Company's system to our customers sooner. Decreasing the full deployment term by one year increases the annual cost for the remaining five years, but the increase is offset by the reduction in cost of the meter installations, and the management and administration costs of the original sixth year. This offset makes the compression of the deployment timeline cost neutral.

In the Amended Smart Meter Plan, the Company also proposes to delay implementation of certain functionalities. This delay is necessary in order to prioritize implementation of other regulatory and business requirements that impact customers and electric generation suppliers ("EGSs"). Under the Amended Smart Meter Plan, Duquesne Light is also proposing to move the ability to enable Time of Use ("TOU") rates, real-time pricing ("RTP") and net metering from 2015 to 2016. Duquesne Light notes that its Large Commercial & Industrial ("Large C&I") customers already receive RTP through interval meters. In addition, Duquesne Light offers net metering to customer generators through the present process of using two meters, one for delivered energy and one for received energy.

Under the Amended Smart Meter Plan, the Company is also proposing to implement an ADMS to achieve enhanced outage communication and voltage monitoring capabilities. In the 2012 Smart Meter proceeding, the Commission directed Duquesne Light to make a compliance filing providing data supporting whether or not inclusion of voltage monitoring and communication of outages and restorations capabilities are cost effective. The Company submitted a compliance filing proposing to evaluate these functionalities. In this Amended Smart Meter Plan, the Company is proposing to implement the ADMS which will provide benefits to both the Company and to customers.

Duquesne Light also is providing updated smart meter cost estimates in this filing. In the 2012 Smart Meter Plan, the Company estimated that its Advanced Metering Infrastructure ("AMI") costs for the smart meter plan (excluding FOCUS costs) would be $203 million. The Company's updated estimate for AMI costs is $257 million, and $319 million including the ADMS system. The ADMS costs are estimated at $46-56 million, plus $5-6 million for ongoing operations of the ADMS system during implementation. The AMI increase is due primarily to:

1. Hardware/Software - Original budget assumed that the hardware and software for FOCUS would be sufficient to support the AMI program. Additional servers, operating system licenses and database software were necessary to support additional development and test recovery environments. Finally, Meter Shop software replacement cost was not included in the original amount. This software is used to receive new meters into inventory and then manage the testing and the status of the meters in and out of the company.
2. Systems Integrator - The original budget included estimates for a system integrator prior to selecting a SI vendor. Once the vendor, Accenture, was selected following a competitive procurement, their costs were higher than the estimated
3. Internal Labor - The DLC labor costs increased from the original budget for the following reasons:
   - The original budget only included labor for full time employees that were solely working on the AMI project. The revised budget includes all full-time and part time labor for time spent by employees working on the program, including those in the original filing.
   - The Company established a new project management office ("PMO") with shared services functions, to manage the complexities of the program and the interrelationship with other IT initiatives and meeting the deadlines established for AMI.
4. Outside Services - A number of third party suppliers are budgeted and in some cases have been utilized to provide a variety of AMI related services. A sampling of those suppliers and services include:

- OPower was selected to provide a customer presentment platform to provide customers with access to their usage data,
- Customer Service Entrance Repairs,
- Cyber Security vulnerability assessment and penetration testing across AMI.

In the Company's Initial Smart Meter filing and the 2012 Smart Meter filing, the Commission approved, with certain modifications, Duquesne Light's request to recover its smart meter costs through a fully recoverable Smart Meter Charge ("SMC"). In this proceeding, Duquesne Light is proposing to continue to recover its smart meter costs through its Commission-approved SMC.

II. BACKGROUND

Duquesne Light is a public utility as that term is defined under Section 102 of the Public Utility Code, 66 Pa. C.S. § 102, certificated by the Commission to provide electric service in the City of Pittsburgh and in Allegheny and Beaver Counties in Pennsylvania.

On October 15, 2008, Governor Rendell signed into law Act 129 of 2008, which took effect on November 14, 2008 and, *inter alia*, mandated a smart meter procurement and installation program. *See* 66 Pa. C.S. § 2807(f), et seq. ("Act 129"). Act 129 provides, among other things, that each Pennsylvania EDC with at least 100,000 customers is required to provide smart meter technology to customers in accordance with a schedule not to exceed 15 years. Act 129 defines smart meter technology as follows:

> (g) Definition. – As used in this section, the term "smart meter technology" means technology, including metering technology and network communications technology capable of bidirectional communication, that records electricity usage on at least an hourly basis, including related electric distribution system upgrades to enable the technology. The technology shall provide customers with direct access to and use of price and consumption information. The technology shall also:
>
> (1) Directly provide customers with information on their hourly consumption.
>
> (2) Enable time-of-use rates and real-time price programs.
>
> (3) Effectively support the automatic control of the customer's electricity consumption by one or more of the following as selected by the customer:
>
> (i) the customer;
>
> (ii) the customer's utility; or
>
> (iii) a third party engaged by the customer or the customer's utility.

66 Pa. C.S. § 2807(g).

The Commission adopted its *Smart Meter Implementation Order* on June 18, 2009, outlining its guidance for an EDC's Smart Meter Procurement and Installation program pursuant to Act 129. The *Implementation Order* established the standards that each plan must meet and provided guidance on the procedures to be followed for submittal, review and approval of all aspects of each smart meter plan. Additionally, upon the recognition that it will take time to fully develop and install the entire smart meter network, the Commission granted a grace period of 30 months following plan approval ("Grace Period") before requiring EDCs to commence installation of smart meters at customers' premises.

In the *Implementation Order*, the Commission identified six minimum functionalities that EDC smart meter systems must provide under Act 129. These six minimum functionalities are:

1. Bidirectional data communications.
2. Reading usage data on at least an hourly basis once per day.
3. Providing customers with direct access to and use of price and consumption information.
4. Providing customers with information on their hourly consumption.
5. Enabling time-of-use ("TOU") rates and real-time price options.
6. Supporting the automatic control of the customers' electric consumption.

Implementation Order, pp. 29-30.

In addition, the Commission stated that each Plan filing should include an analysis of the individual incremental costs for deploying and operating the following nine additional smart meter technology capabilities:

1. Ability to remotely disconnect and reconnect.
2. Ability to provide 15-minute or shorter interval data to customers, EGSs, third-parties and an RTO on a daily basis, consistent with the data availability, transfer and security standards adopted by the RTO.
3. On-board meter storage of meter data that complies with nationally recognized non-proprietary standards such as ANSI C12.19 and C12.22 tables.

4. Open standards and protocols that comply with nationally recognized non-proprietary standards, such as IEEE 802.15.4.

5. Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible.

6. Ability to monitor voltage at each meter and report data in a manner that allows an EDC to react to the information.

7. Ability to remotely reprogram the meter.

8. Ability to communicate outages and restorations.

9. Ability to support net metering of customer-generators.

Implementation Order, p. 30.

In the *Implementation Order*, the Commission further noted that it may waive the additional requirements for an EDC if the requirements are not cost-effective.

On August 14, 2009, Duquesne Light filed its Initial Smart Meter Plan with the Commission. In its Initial Smart Meter Plan, the Company, among other things: (1) provided a description of its current metering system, (2) explained how it would address customer requests for smart meters and installation of smart meters in new construction during the grace period, (3) explained its approach for developing a Final Smart Meter Plan within the 30 month grace period, (4) proposed a milestone and status reporting schedule during the grace period, (5) provided an estimated budget for grace period budget, and (6) proposed a cost recovery mechanism for recovering smart meter costs.

On May 11, 2010, the Commission approved Duquesne Light's Initial Smart Meter Plan, with certain modifications. *Petition of Duquesne Light Company for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123948. In summary, the Commission approved Duquesne Light's proposal to recover its smart meter costs through a reconcilable cost recovery mechanism, and set forth the details of how this mechanism would work. In addition, the Commission approved the Company's proposed smart meter implementation schedule, which the Company explained was subject to change. The

Commission also approved the Company's proposed milestone filing dates, and the Company's proposal to file a Final Smart Meter Plan by December 31, 2011.

On July 1, 2010, the Company filed a Cost Benefit Analysis for the additional smart meter capabilities identified in the *Implementation Order*. Therein, the Company provided a detailed evaluation of the costs to implement each of the nine additional smart meter capabilities identified in the *Implementation Order*, the potential benefits of implementing these additional capabilities and the Company's recommendations regarding whether it should be required to implement these additional capabilities. In the July 1, 2010 filing, Duquesne Light explained that its cost-benefit analysis was a preliminary analysis based upon information that was available at the time. Duquesne Light requested that the Commission defer ruling on whether Duquesne Light should implement the additional smart meter capabilities at that time, pending the submission of more exact cost information with Duquesne Light's Final Smart Meter Plan filing. Duquesne Light further explained that it would have a better estimate of its smart meter costs at a later time and that the Company would provide a refined project budget and cost estimates in its Final Smart Meter Plan filing.

On December 29, 2010, Duquesne Light filed its Application for Approval of Assessment of Needs, Technology Solutions and Vendor Selection ("Assessment Application"). In summary, in the Assessment Application, Duquesne Light proposed to replace its existing Automated Meter Reading ("AMR") system with a new AMI system that would provide two-way communication between the meter and the Company and would comply with all requirements of Act 129 and the Commission's *Implementation Order*. In the Assessment Application, the Company requested that the Commission issue an order approving: (1) the procedure used to evaluate and select a primary AMI vendor, (2) the Company's Assessment of Needs, (3) the Technology Section of RF mesh and associated findings, (4) the selection of the Company's Primary AMI vendor, (5) updated cost projections for the entire Smart Meter Project and Deployment, and (6) any other approvals that the Commission deemed to be necessary.

On January 31, 2011, the Company filed a Supplement to its Assessment Application. In the Supplement, Duquesne Light identified Itron, Inc. ("Itron") as its recommended primary

contractor to design, construct, implement and oversee the Company's Smart Meter program. The Company explained that it had issued bids for smart meter contractors and received four bids. Itron scored the highest on a technical evaluation of the bids and provided the lowest cost solution of the four bidders. In the Supplement, Duquesne Light requested Commission approval of the initial Assessment Application and Supplement. No party objected to the Company's Assessment Application or its Supplement. The Commission did not issue an Order with respect to the Assessment Application or the Supplement thereto.

On March 31, 2011, the Company filed its Establishment of Network Design for the Duquesne Light Smart Meter Program ("Network Design") with the Commission. Therein, the Company explained that it had conducted a study to review the Company's existing communication infrastructure, review network and communication infrastructure necessary for the AMI and also review available private and public written communications solutions. Specifically, the Company evaluated:

- Operating Frequencies Available in its Service Territory;
- Radio Technologies/Vendors;
- Solution Cost (up front and ongoing)
- Expected capacity, bandwidth, latency and reliability of each option;
- Security provisions (public versus private writers communications); and
- Advantages and disadvantages of available solutions.

The initial Network Design conclusions supported the use of private wireless options as the primary communication methodologies, with public wireless as a backup communication. The Company also noted that further analysis was necessary to finalize the Network Design Study conclusions and that the proposed design was subject to change based on further findings or in the event that other viable technologies would become available.

On June 30, 2011, the Company filed an additional update related to design, testing and certification of Electronic Data Interchange ("EDI") transactions. Duquesne Light determined that it would provide customers with direct access to non-validated real time data directly from

the smart meter through the Home Area Network (HAN) to an in-home devise for residential customers. Validated hourly interval data would be provided through a secure web portal within 24 hours from the completion of the data upload for the entire population of Duquesne smart meters to the MDM systems. Additionally, non-validated, real time data would be provided to third parties through a secure, authenticated connection at the expense of the third party. Validated hourly interval data would be provided to third parties through a standard interface consistent with the North American Energy Standards Board within 24 hours of the completion of the data upload for the entire population of Duquesne smart meters to the MDM systems. Finally, the Company will provide EDI access to smart meter data to authorized commercial operators, such as conservation service providers and electric generation suppliers ("EGS") using the 867 historical interval usage transaction.

On October 6, 2011, the Company filed an Installation, Testing and Rollout of Support Equipment and Software Update filing. The purpose of the October 6 update filing was to outline the equipment testing that the Company planned to conduct prior to deploying AMI meters across its service territory.

On November 2, 2011, the Company filed a status update related to its Establishment of Plans for Installation of Meters and Outside Communications and Training. Therein, the Company provided an overview of its smart meter deployment plan, a high level Smart Meter Program Schedule and Milestones, and an overview of its Staff Training Plan.

On November 18, 2011, the Company filed a status update with respect to its Smart Meter Plan and further requested a six month extension, from December 31, 2011 to June 30, 2012, to file the Company's Final Smart Meter Plan. With respect to the status update, the Company provided a summary of the work that it had done in the previous 18 months. In addition, the Company noted that there were several smart meter issues that it was still reviewing.

On December 13, 2011, the Commission issued a Secretarial Letter granting the Company's request for an extension, until June 30, 2012, to file its Final Smart Meter Plan.

Duquesne Light Company –Amended Smart Meter Plan

On June 29, 2012, the Company filed a Petition for Approval of its 2012 Smart Meter Plan. Included with the Petition was a copy of the Plan and direct testimony in support of the Plan. The 2012 Smart Meter Deployment Plan detailed the Company's plans to replace its Advanced Meter Reading ("AMR") system with AMI and deploy smart meters over a seven year period from 2014-2020. As detailed in the Smart Meter Deployment Plan, Duquesne Light's Advanced Metering Infrastructure ("AMI") project includes four components: 1) Itron Smart Meters, 2) Local Area Network ("LAN"), 3) Wide Area Network ("WAN"), and 4) the Head-End Collection System. The Smart Meter Deployment Plan also provided a phased in approach to implementing the functionality required by Act 129 and the Commission's *Implementation Order.*

Following extensive investigation by interested stakeholders, on December 7, 2012, Duquesne Light and the Office of Consumer Advocate filed an uncontested Joint Petition for Approval of Full Settlement ("Joint Petition"). On January 24, 2013, Administrative Law Judge Katrina Dunderdale issued an Initial Decision approving the Joint Petition.

On May 6, 2013, the Commission entered an Opinion and Order ("May 6 Order") granting and modifying the Smart Meter Deployment Plan and granting and modifying the Joint Petition. In the May 6 Order, the Commission directed Duquesne Light to make a compliance filing within ninety (90) days of the date of entry of the May 6 Order providing data supporting whether or not inclusion of the voltage monitoring and communication of outages and restorations capabilities are cost effective, among other things.

On August 2, 2013, Duquesne Light submitted its Compliance Filing. In its Compliance Filing, Duquesne Light proposed to initially evaluate Volt/VAR optimization, outage notification, and transformer loading capabilities. The Company explained that Voltage/VAR optimization can reduce line loss inefficiencies by optimizing reactive power flow and improving the PF (Power Factor) of the electrical distribution system thereby decreasing the amount of current flow necessary to meet customer load demand. Outage notification using AMI data together with a compatible Outage Management System ("OMS") will provide better diagnostics and control of abnormal conditions during power outages. This would allow power outage restoration to be

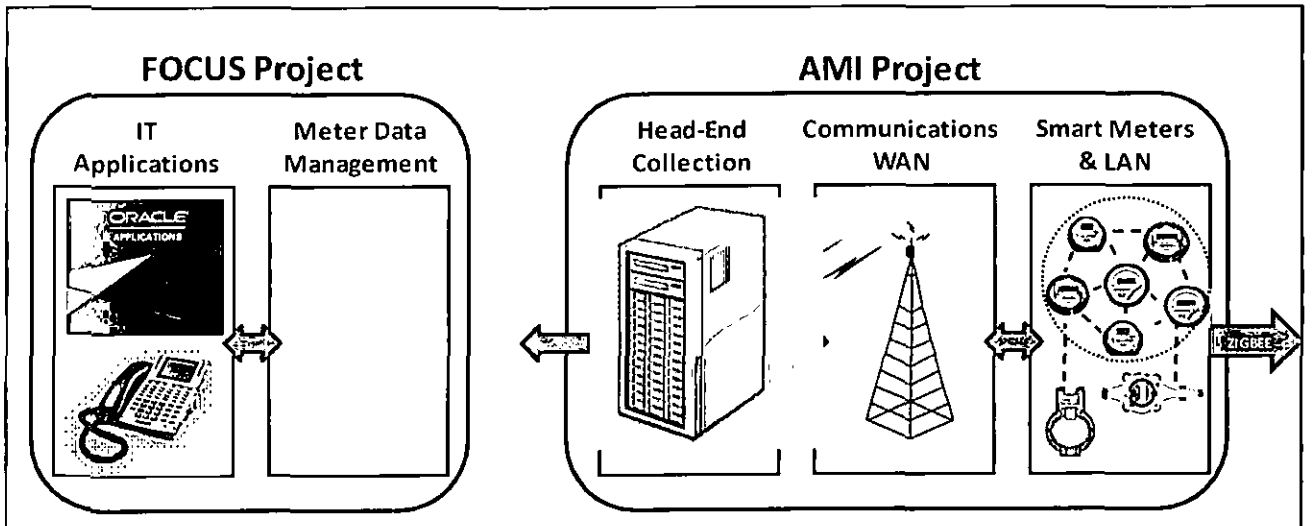
completed faster than before and would increase reliability of the electrical distribution system. The system would provide proactive communications with customers affected by a power disruption. Finally, transformer load monitoring capability can minimize outages caused by overloading transformers during peak demand periods. Duquesne Light also proposed to execute a multi-year project to install a new OMS that is capable of sharing data with AMI, and to perform electrical modeling of the distribution system. No parties filed comments to the Company's Compliance Filing.

III. AMENDED SMART METER PLAN

A. INTRODUCTION

As explained in the 2012 Smart Meter Plan filing, Duquesne Light's Smart Meter Program consists of two major projects, FOCUS and AMI. Diagram #1 provides a high-level overview of the scope of Duquesne's Smart Meter Program.

Diagram # 1: Duquesne Smart Meter Program – Two Major Projects



- Smart Meter Program (Surcharge):
  - Customer Care & Billing (CC&B)
  - Meter Data Management (MDM)
  - CC&B / MDM Integration
  - Grace Period IT System Purchases
- Other Elements (Non-Surcharge):
  - Mobile Workforce Mgmt. (MWM)
  - Interactive Voice Response (IVR)
  - Web Self-Service Portal (WSS)
  - Field Work Integration (FWPIP)

- ITRON Components (Surcharge):
  - Head-end Data Collection System
  - Smart Meters
  - Mesh Local Area Network (LAN)
- Non-ITRON Components (Surcharge):
  - Wide Area Network (WAN)
    - Intermediate Communications
    - Backhaul Communications
  - MDM / Head-End Collection Integration

- Customer Direct Access via ZigBee Wireless Technology

Duquesne Light Company –Amended Smart Meter Plan

Under the FOCUS project, Duquesne Light replaced its customer information system with a Customer Care and Billing ("CC&B") system and is implementing a new Meter Data Management ("MDM") system. The Commission approved the upgrade of these Information Technology ("IT") systems in the Company's Initial Smart Meter Plan. The upgrade of these IT systems was necessary in order for Duquesne Light to provide smart meter technology to customers.

Under the AMI project, Duquesne Light will install Itron smart meters, develop necessary communication networks and install a head-end data collection engine for smart meter data. In addition, Duquesne Light will hire a systems integrator to integrate all of the separate components of the Company's Smart Meter Program. This is a critical function in order to ensure seamless operation of the AMI system.

As explained below, Duquesne Light proposes to deploy its AMI System over a six-year period as opposed to the seven-year period that was proposed in the 2012 Smart Meter Plan. The six-year period includes a two-year ramp up period to allow systems testing before they are implemented on a broader scale. The Company proposes a deployment schedule with full deployment by the end of 2019. In addition, the Company proposes to phase-in AMI functionalities over time to allow the markets for these functionalities to become more mature. The Company's AMI System will meet all of the requirements of Act 129 and provide all of the additional capabilities set forth in the Commission's *Implementation Order*, after all functionalities are phased-in.

In addition, the Company is proposing to implement an ADMS to enable enhanced outage communication and voltage monitoring capabilities.

The AMI component of the Smart Meter Program is estimated to cost approximately $257 million. This is an updated estimate from the 2012 Smart Meter Plan. The Company has provided additional details regarding these costs herein. In addition, the Company proposes to continue to recover its smart meter costs through its SMC.

These topics are discussed in more detail below.

B. FOCUS PROJECT

In its *Implementation Order*, the Commission recognized that a fully functional smart meter involved more than just the meter hardware attached to the customer's premises. *Implementation Order*, p. 6. Therein, the Commission stated as follows:

> A fully functional smart meter that supports the capabilities required by Act 129 and as outlined below, involves an entire network, to include the meter, two-way communication, computer hardware and software, and trained support personnel.

Consistent with this direction from the Commission, Duquesne Light explained in its Initial Smart Meter filing that it was required to replace its billing, data collection and back-office systems in order to provide smart meter technology to customers. This project is called the FOCUS Project.

The FOCUS project encompassed significant upgrades to the Company's existing IT system architecture in order to provide the back-office foundation necessary to successfully deploy smart meters. Duquesne Light's former customer information system ("CIS") was adequate for sustaining existing business requirements, but is insufficient for meeting Act 129 and the Commission's *Implementation Order* Smart Meter requirements. Functionality enhancements such as TOU rates, real-time price programs, remote disconnect and reconnect, direct access to price and consumption information, and the automatic control of customer's electric consumption could not be supported without replacing Duquesne Light's former CIS.

As part of FOCUS project scope within Duquesne Light's Smart Meter Program, the Company implemented the Oracle Customer Care and Billing ("CC&B") module within the Utility Application Suite to replace its former existing CIS. In addition, Duquesne Light purchased the Oracle MDM module and implemented this component of the Utility Application Suite with CC&B as a part of the FOCUS project. The implementation and integration of these two modules provides the necessary IT system foundation components to support the subsequent extension of this architecture for AMI system capabilities. The FOCUS project was an integral

part of Duquesne Light's Plan for meeting Act 129 and the Commission's *Implementation Order* requirements.[1]

The FOCUS System went live on November 28, 2014.

C. AMI PROJECT

1. Introduction

There is a growing demand for sophisticated metering (e.g., net metering), meter data management and price responsive rates as customers have a greater interest in reducing their electric bill. These new demands and requirements cannot be met with Duquesne Light's current meter and system infrastructure.

Pursuant to the milestones detailed in the Company's Initial Smart Meter Plan, Duquesne Light filed an assessment of its AMI technology requirements and potential solutions on December 29, 2010. In the 2012 filing, Duquesne Light described the comprehensive process it undertook with its AMI advisor, SAIC, Inc. ("SAIC") (formerly R. W. Beck), to assess its current AMR technology environment as well as explicitly document the Company's requirements for a future AMI technology environment in the form of a formal Request for Proposal (RFP). The December 2010 filing also described the rigorous RFP process that the Company followed with its AMI advisor to create a short-list of two AMI vendors with similar solutions that best addressed Duquesne Light's needs ranked exclusively on technical merit. In a supplemental filing submitted on January 31, 2011, Duquesne Light advised the Commission concerning the selection of ITRON's OpenWay solution as the most cost effective AMI system for addressing its needs.

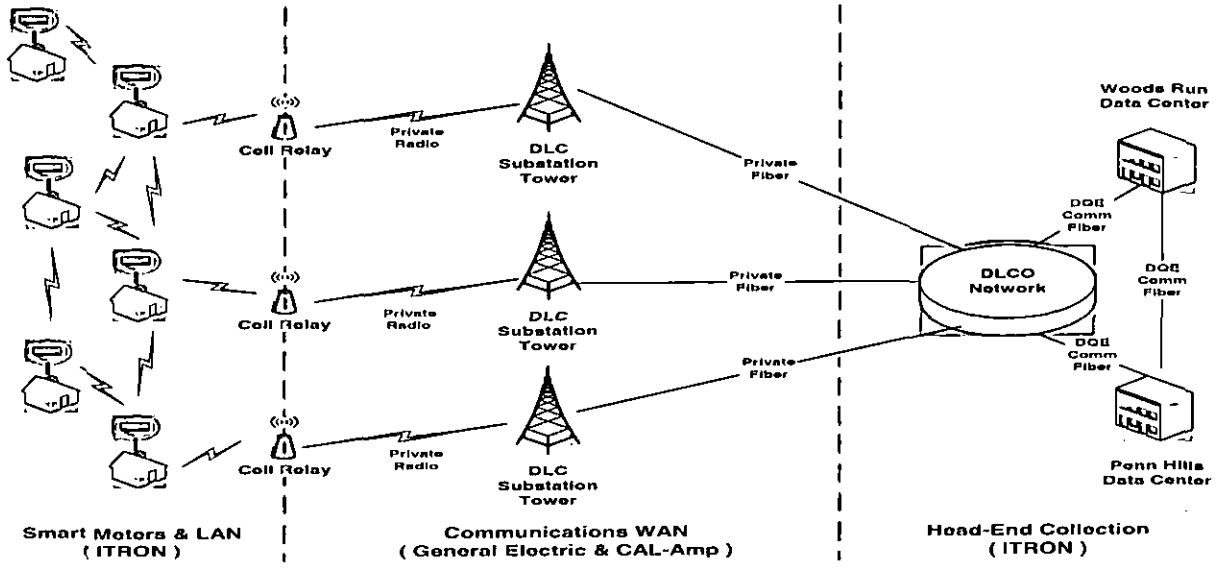
[1] The FOCUS project also includes several supporting scope components that are not part of Duquesne Light's Smart Meter Program. Some of these more significant components include the implementation of the Oracle Mobile Workforce Management ("MWM") module as well as its integration with CC&B, the replacement of our existing Interactive Voice Response ("IVR") system, and the redesign of our Outage Analysis System ("OAS") and Web Portal ("WSS") to work with CC&B.

In the first step of defining the AMI project scope, a technology needs assessment was performed to identify the necessary AMI requirements to minimally meet ACT 129 smart meter requirements, as well as the additional requirements outlined in the Commission's *Implementation Order*. The requirements assessment was performed by outlining the current state of Duquesne Light's technology, including AMR and back-office supporting systems, either currently installed, or planned for installation, that would either directly or indirectly integrate with AMI during the Smart Meter deployment phase. By understanding the current environment, AMI requirements could be defined and outlined in a detailed RFP which would ensure that the solutions AMI vendors proposed succinctly addressed Duquesne Light's needs.

In the 2012 Smart Meter filing, the Commission approved Duquesne Light's AMI solution, which includes four components. These four components are:

- Smart Meters
- Local Area Network
- Wide Area Network
- Head End Data Collection Engine

Diagram 2 below provides an overview of the AMI System Components. *Diagram # 2: Duquesne AMI System Architecture*



Duquesne Light plans to replace all existing AMR meters with new smart meters that will provide two-way communication between each customer premise and the utility. All single phase meters will be equipped with ZigBee[2] data channels to enable customers direct access to interval usage data, and provide a platform for future HAN applications. The selected AMI solution is capable of providing interval data for all meters, and single phase meters will be equipped with an internal switch for remote connections and disconnections.

Duquesne Light is not proposing to modify the AMI solution components in this filing.

2. Smart Meters

In the 2012 Smart Meter filing, the Commission approved Duquesne Light's plan to install ITRON smart meters for all customers. The ITRON Smart Meters include the latest advanced metering technology, including bidirectional data communications, ZigBee direct access capabilities and a remote connect/disconnect switch. The ITRON smart meters and related advanced metering infrastructure discussed below will meet all of the six minimum smart meter requirements set forth under Act 129, including:

1. Bidirectional data communications.
2. Reading usage data on at least an hourly basis once per day.
3. Providing customers with direct access to and use of price and consumption information.
4. Providing customers with information on their hourly consumption.
5. Enabling TOU rates and RTP options.
6. Supporting the automatic control of the customers' electric consumption.

In addition, the ITRON Smart Meters and related advanced metering infrastructure will meet all of the nine additional smart meter requirements set forth in the *Implementation Order*, including:

1. Ability to remotely disconnect and reconnect.

[2] ZigBee is a commonly used communication specification for advanced metering systems. ZigBee has the ability to link smart meters with devices such as thermostats, household appliances, HVAC and other equipment that uses electricity.

2. Ability to provide 15-minute or shorter interval data to customers, EGSs, third-parties and an RTO on a daily basis, consistent with the data availability, transfer and security standards adopted by the RTO.

3. On-board meter storage of meter data that complies with nationally recognized non-proprietary standards such as ANSI C12.19 and C12.22 tables.

4. Open standards and protocols that comply with nationally recognized non-proprietary standards, such as IEEE 802.15.4.

5. Ability to upgrade these minimum capabilities as technology advances and becomes economically feasible.

6. Ability to monitor voltage at each meter and report data in a manner that allows an EDC to react to the information.

7. Ability to remotely reprogram the meter.

8. Ability to communicate outages and restorations.

9. Ability to support net metering of customer-generators.

Further explanation regarding how Duquesne Light's AMI system will meet all of the six minimum smart meter requirements set forth under Act 129 and will meet all of the nine additional smart meter requirements set forth in the *Implementation Order* is provided in Section E below. In addition, the specific technical capabilities of the ITRON smart meters, including the AMI standards supported by the ITRON smart meters are set forth in Appendix A.

Duquesne Light is not proposing to revise its Commission-approved plan to install ITRON smart meters for customers. To date, Duquesne Light has installed 70,000 ITRON smart meters.

3. Mesh or Local Area Network ("LAN")

The LAN consists of the transmission of data between ITRON smart meters and ITRON cell relays. The LAN has the following features:

- An RF mesh based solution that is capable to being Upgraded to an IPv6 based mesh solution
- Bi-directional communication
- Operates in the unlicensed 900 MHz band
- 902-928 MHz Bandwidth (with frequency hopping signaling)

- *Supports 142-153 kilobits per second ("kbps") throughput*
- Each cell relay supports up to approximately 2,000 meters
- Support of IP and native DNP protocols when running the full IPv6 solution

Duquesne Light is not proposing to revise this aspect of its Commission-approved plan. To date, Duquesne Light has installed 133 DAPs as part of the LAN.

4. Wide Area Network ("WAN")

The WAN provides data communications between the LAN and the Head-End data collection system. A diagram of the AMI system architecture, including the WAN, is shown on Diagram 2 above.

The solution for the WAN component of the AMI system was determined with the assistance of SAIC. Pursuant to the milestones detailed in the Company's Initial Smart Meter Plan, Duquesne Light filed a preliminary design for the AMI communication network on March 31, 2011. In this preliminary design of the WAN component of the AMI system, Duquesne Light proposed a private radio solution as opposed to a public wireless solution for the intermediate portion of the WAN, which connects the cell relays that are part of ITRON's LAN to existing Duquesne Light owned communication towers. See Diagram # 2. The preliminary design also proposed leveraging the private fiber currently leased by Duquesne Light from DQE Communications that already exists between Duquesne Light's communication towers and data center for the back-haul portion of the WAN. At the time of the March 31, 2011 filing, this preliminary design was determined to be the most cost-effective solution for the WAN component of Duquesne Light's AMI system. The following is a bulleted summary of the Company's preliminary due diligence efforts.

- Engaged SAIC in November 2010 to assist with the AMI Communication Network technology and cost assessment
- Analyzed multiple Private Licensed Wireless (Radio), Private Unlicensed Wireless (Radio) and Public Wireless alternatives for the LAN Cell Relay to Tower communication network
- SAIC recommended a combination of two Private Licensed Wireless solutions (3.65 GHz & 220 MHz) as cost effective alternatives that best met Duquesne Light's technological requirements

- Recognizing the potential unavailability of 220 MHz spectrum in DLC territory, the recommendation also included 900 MHz as a replacement
- It was noted that public wireless could be used as a back-up to the private wireless solution
- Filed preliminary communications network design with PA PUC in March 2011 based on SAIC's recommendation

In requesting and subsequently receiving a six month extension for filing our 2012 Smart Meter Plan, Duquesne Light committed to performing additional due diligence related to private versus public WAN solutions in light of new information that public carrier price offerings were becoming more cost competitive. After several more months of analysis, Duquesne Light confirmed that a private wireless solution as originally proposed is the best solution because it provides Duquesne Light with more control over the security and reliability of the system as well as strategic opportunities to utilize available bandwidth for other data communication applications including mobile workforce, SCADA, and corporate security. The private wireless solution has more initial costs than a public wireless solution. However, the private wireless solution has considerable annual O&M savings which offset the initial upfront costs over the life of the system. A financial analysis between private versus public networks was too close to conclusively drive the decision of one type over the other.

The following is a bulleted summary of our additional due diligence efforts.

- Met with WAN vendors to determine availability of licensed spectrum in Duquesne territory
- Determined that 220 MHz was not an available spectrum
- Reserved 900 MHz spectrum from Space Data through a 15 month lease with an option to buy upon termination
- Worked with SAIC and ITRON to develop a Propagation study to evaluate coverage capabilities of the 3.65 GHz and 900 MHz Private Licensed Wireless solution
- Finalized capital and on-going O&M cost estimates of private and public solutions based on the propagation study
- Developed a detailed cost comparison between the Private Licensed Wireless solution and the Public Wireless solution

- Determined that the private wireless solution was still the best value for Duquesne Light
- Filed a private wireless solution for the WAN component of our AMI system as part of this Plan

Duquesne Light is not proposing to revise this aspect of its Commission-approved plan. To date, Duquesne Light has installed 13 towers as part of the WAN.

5. Technical Advantages of the New AMI System

There are several distinct technical advantages associated with the Commission-approved AMI system architecture network over the existing AMR system. First and foremost, the existing AMR system architecture only supports a single directional data flow (from meter to head-end data collection engine), whereas the AMI System architecture supports a bi-directional data flow.

Secondly, the existing AMR system LAN solution requires each meter to be in the line of sight of a Cell Control Unit ("CCU") in order to communicate. The new AMI system LAN solution uses mesh network technology which enables meters to communicate to each other. A meter that is not in line of sight of a cell relay communicates its data to a neighboring meter who in turn communicates its data to a neighboring meter and this process continues until the data is consolidated at a meter that does have line of sight to a cell relay. This mesh network technology only requires a portion of the meters to be in the line of sight of a cell relay in order for all meters to be read. Since most meters have several neighboring meters, the mesh network technology also provides redundant paths for communicating data to a cell relay. Therefore, the AMI system solution greatly reduces the amount of LAN components that need to be installed in order to cover all of Duquesne Light's service territory. This will make it more cost effective to read 100% of Duquesne Light's meters at least once daily rather than the 80 to 90% that are being read daily with the AMR system.

Finally, the existing AMR system architecture requires multiple, disparate solutions to communicate with all of Duquesne Light's meters. These solutions differ for all three system components including the type of meter data communications; the WAN communication protocols; and the head-end collection engine applications. The AMI system architecture uses a

single type of meter data communications; a common WAN communication protocol and the same head-end data collection engine application to communicate with all of Duquesne Light's meters.

6. Head-End Data Collection Engine

As part of its AMI Project, Duquesne Light installed a Head-End Data Collection Engine in June 2015. The Head-End Data Collection Engine performs network management and coordinates data collection and operations. The Head-End Data Collection Engine has the following characteristics:

- Collects interval meter usage data for all single phase and three phase meters.
- Support scheduled (automatic) and unscheduled (operator-initiated) meter reads.
- Remotely downloads updates to meter settings, configuration, security settings, and firmware for all AMI devices.
- Obtains meter data, such as register and power status, on demand.
- Communicates with groups of AMI meters and consumer owned control devices to enable load management.
- Collects and reports measurement data, control events, self-test data and alerts, service continuity data and alerts, power quality data and alerts (including tamper), programming events, configuration settings, etc.
- Monitors, analyzes, and manages service continuity.
- Supports and reports service continuity and voltage interruptions.
- Supports monitoring, analyses, and management of customers' power quality.
- Supports customer (scheduled and unscheduled) load control functions.
- Provides automatic self-registration of AMI endpoints/meters.
- Supports meter self testing, system performance monitoring and reporting.
- Effectively employs Service Oriented Architecture ("SOA") and/or Enterprise Service Bus ("ESB") technologies for communication among its application modules and for interoperation of its system components with Duquesne's other information systems.

D. IT SYSTEMS

1. Introduction

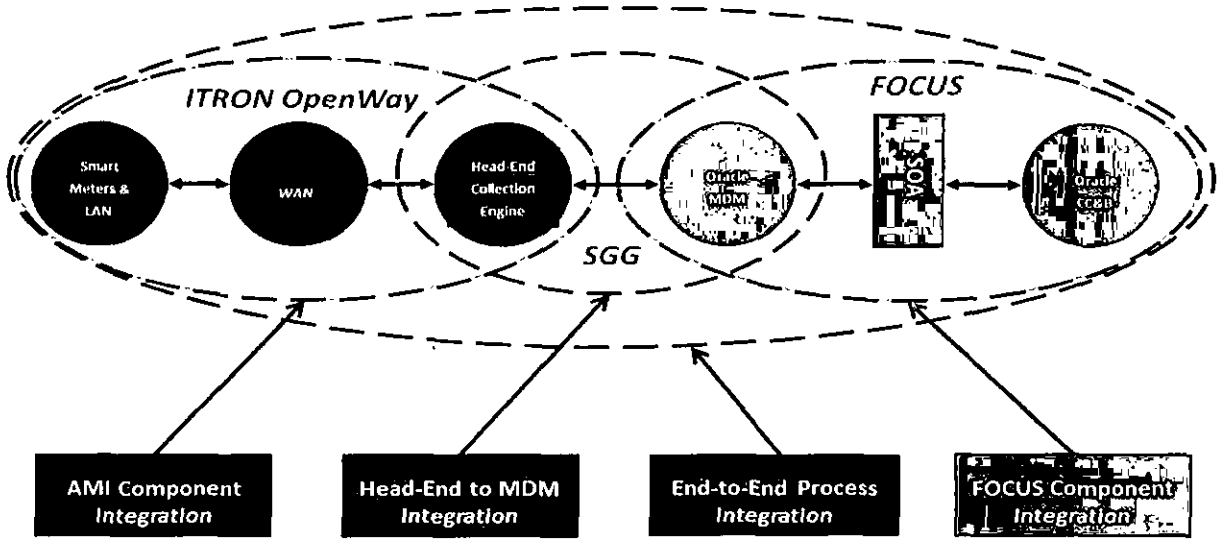
In addition to the AMI Project scope described in the section above, Duquesne Light's 2012 Smart Meter Plan, as approved by the Commission, included the implementation, ongoing support and multifaceted integration of several IT systems. Some of the more significant of these IT systems such as Oracle's CC&B and MDM were implemented and integrated as part of the Focus Project but also require further systems integration and functional enhancements as part of the AMI project.

Much of the systems integration and ongoing support work requires specific expertise and technology skills that are not available within Duquesne Light's existing internal IT staff. Therefore, the Plan supplements Duquesne Light's resources with third party IT vendor delivery and support resources as well as third party Systems Integrator ("SI") resources.

2. Systems Integration

As shown on Diagram #3 below, Duquesne Light's Smart Meter Program has four levels of complex systems integration that must work both independently as well as in conjunction with each other in order for the entire solution to function properly.

Diagram #3: Duquesne Light Systems Integration



The first level of systems integration is to establish a bidirectional interface between the CC&B and MDM components of the FOCUS project. The integration of these two components is facilitated through Oracle's Services Oriented Architecture ("SOA"). All meter usage data is validated, edited and estimated ("VEE") by the MDM module before it is passed to CC&B on a request basis for billing purposes. This cleansed usage data along with meter events such as tamper notifications is also utilized to support other customer oriented transactions such as high bill complaints, meter inspections and the automated completion of service orders that require a meter read.

The second level of systems integration is to establish a bidirectional interface between the Smart Meters deployed at customer premises and the Head-End Collection Engine installed at Duquesne Light's data center. The integration of these two components is facilitated through the AMI system communication network, which includes the Local Area Network ("LAN") and the Wide Area Network ("WAN"). The Smart Meter records interval data on at least an hourly basis which then must be collected from the field at least once daily by the Head-End Collection Engine. The LAN and WAN provide the connectivity necessary to accomplish this automated data collection. This bidirectional interface is also used for collection of meter events and alerts as well as to perform firmware upgrades within the meter.

The third level of systems integration is to establish a bidirectional interface between the Head-End Collection Engine and the MDM module. The integration of these two components is facilitated through Oracle's Smart Grid Gateway ("SGG"). SGG provides standard adapters for data exchange between Head-End Collection Engines from leading AMI vendors and Oracle's MDM module. All requests for meter usage data, events and alerts from Smart Meters are initiated from the MDM module. Therefore, the Head-End Collection Engines receives all of its instructions on what data to collect from the field as well as when to collect this data through the SGG.

The fourth level of systems integration is to establish end-to-end business processes that leverage the bidirectional interfaces between all of the components that were implemented and interfaced in the previous three levels. These end-to-end business processes include base metering

functions such as monthly billing; daily displays of usage data on a customer web portal; commissioning and decommissioning of meters; and on-demand meter reads as well as advanced metering functions such as remote connects and disconnects; automated control of electric consumption; and provisioning of Home Area Network (HAN) devices.

The Commission approved the Company's system integration plan in the 2012 Smart Meter Plan.

3. Functional Enhancements

There are many functional enhancements to IT systems required to meet the smart meter requirements of ACT 129 and the Implementation Order, which are described in more detail in the AMI System Capabilities section of this plan. In addition, there are other functional enhancements to IT systems that leverage these AMI system capabilities to provide expanded self-service offerings to our customers as well as better information for our customer service representatives. These functional enhancements are described in more detail in the following appendices to this Plan:

- Bill-to-Date & Projected Bill – Appendix B
- Bill Alerts – Appendix C
- Smart Meter Usage Display – Appendix D
- Web Dashboard – Appendix E

4. Systems Integrator

The complexity of integrating multiple IT systems from multiple vendors across several lines of business such as customer care and metering operations along with deploying all new advanced meters and communication networks requires specific expertise across several technology disciplines that do not exist internally within Duquesne Light. Therefore, Duquesne Light engaged a Systems Integrator (SI) to manage the IT systems work effort within the AMI project. The success of the AMI project is highly dependent on engaging an SI that has utility industry experience with both AMI technology projects as well as with Oracle Utility Application Suite implementations. The SI will have ultimate responsibility for the implementation of the

remaining three levels of integration (the first level will be complete upon implementation of the FOCUS project) of Duquesne Light's Smart Meter Program. This responsibility includes oversight of the IT system integration and functional enhancement work performed by other vendors such as Oracle and ITRON.

Working with Duquesne Light, one of the initial tasks for the SI will be to finalize the phased implementation approach for the AMI Project. Phased scope definition is established by considering a variety of factors including business criticality and benefit, regulatory mandates, customer needs, overall program risk mitigation, technology availability and delivery, incremental change that users can adapt to and embrace, and other key considerations.

Once the implementation approach and individual phase scopes are confirmed, a detailed project plan will be developed including main tasks, deliverables, milestones and schedule. A Program Management Office (PMO), consisting of Duquesne Light and other vendor resources has been established to manage and monitor the execution of this plan.

Simply defined, System Integration looks beyond a single, independent system or solution delivery with the knowledge, responsibility, and accountability to validate the enterprise solution delivers as planned and is maintainable and supportable over the useful life of the system. System integration encompasses both business and technical integration of applicable processes. Duquesne Light's Final Smart Meter Plan proposes that the SI will act as an implementation advisor driving day-to-day results by validating constant and consistent alignment of the business vision to the technical solution; managing to an integrated program view vs. individual project views; managing overall program dependencies and interactions between related projects and initiatives; balancing competing interests to provide solutions delivering optimal enterprise results; seeking to eliminate overlap, duplication, and redundancy in program activities; and ensuring individual component applications (new, existing, third party) can support end-to-end business processes.

5. On-going Support

The IT systems being implemented as part of both the FOCUS project and AMI project require significant ongoing support. Duquesne Light's Final Smart Meter Plan provides for this support

through the end of the deployment period in the form of annual maintenance agreements with Oracle and ITRON as well as managed service agreements with a third party IT support vendors.

E. AMI SYSTEM CAPABILITIES

In the Commission's *Implementation Order*, the Commission identified six minimum smart meter capabilities that are required by Act 129. *Implementation Order*, pp. 29-30. The commission directed EDCs to quantify the costs to deploy and operate these six minimum capabilities in EDCs' Smart Meter Plans.

In addition, the Commission listed nine additional capabilities that EDCs were to evaluate. The Commission also directed EDCs to quantify the individual incremental costs for deploying these additional capabilities. The Commission further noted that it may waive these additional capabilities to the extent that an EDC or another party demonstrated that the additional capabilities were not cost-effective.

Duquesne Light addresses each of the minimum and additional capabilities set forth in the *Implementation Order* below.

1. Minimum Capabilities Under Act 129

a. Bidirectional data communications

The Company's existing AMR system provides one-way communication from the meter to the head-end data collection engine hosted at Duquesne Light's data center. The new AMI system will provide two-way communication between the meter and the head-end data collection engine hosted at Duquesne Light's data center.

b. Recording usage data on at least an hourly basis once per day

The Company's existing AMR system records usage data on a daily basis for most of our single-phase meters and on at least an hourly basis for all of our three-phase meters. The new AMI system will have the capability of recording usage data at 5, 10, 15, 30 or 60 minute intervals. The Company's AMI communication network will provide the capability to retrieve this data at least once per day for all meters.

c. Providing customers with direct access to and use of price and consumption information

The Company's existing AMR system does not have any direct access capabilities. The new AMI system will include ZigBee enabled smart meters that under current data communication standards can facilitate direct access from the meter to a customer's HAN device for price and consumption information. Duquesne Light will remotely provision and enable the direct access interface once the customer request for direct access has been authenticated. The customer will be responsible for purchasing and installing their own HAN devices as well as establishing the network connection with the ZigBee interface.

d. Providing customers with information on their hourly consumption

The Company's existing AMR system provides most customers with validated daily consumption information through Duquesne Light's secure customer web portal. The new AMI system will provide all customers with validated hourly consumption information within approximately 24 hours after the data has been collected from all meters through Duquesne Light's secure customer web portal.

e. Enabling time-of-use (TOU) rates and real-time price (RTP) programs

The Company's existing AMR system only supports TOU or hourly rates for customers with three-phase meters. The new AMI system will support TOU rates and RTP programs for all customers. As part of the company's Act 129 Smart Sense pilot, Duquesne Light will develop TOU and/or RTP tariffs for our default service customers with smart meters. Duquesne Light will also be able to support TOU rates and/or RTP programs offered by EGS's for our customers with smart meters that switch to an alternate supplier.

f. Supporting the automatic control of the customer's electric consumption

The Company's existing AMR system cannot support the automatic control of the customer's electric consumption. The new AMI system, with its bidirectional data communication and ZigBee enabled smart meters, can be utilized to support demand response or load limiting

programs. Duquesne Light plans to enable third party access to our AMI system for these types of programs through a secure web portal. However, Duquesne Light does not plan to commit to any service level agreements with third parties using our AMI system to facilitate these types of programs.

2. Additional Capabilities under Implementation Order

a. Ability To Remotely Disconnect And Reconnect

Remote disconnect and reconnect functionality allows utilities to turn off or turn on a customer's service at the meter without a physical visit to the premise. This capability is accomplished through additional hardware (a switch) integrated into the meter. This capability is only available for single-phase meters having a 240 volt service with a rating of 200 amps or less.

There are many benefits to implementing the remote disconnect and reconnect functionality. These benefits include improved safety, operational efficiency, revenue collection, employee efficiencies and improved customer experience.

Duquesne Light believes that the benefits of implementing this functionality support implementation. In the 2012 Smart Meter Plan, the Commission approved Duquesne Light's proposal to implement the remote connect/disconnect functionality for all single-phase meters.

b. Ability To Provide 15-Minute Or Shorter Interval Data

As previously stated, the Company's Smart Meters will be capable of recording data in 15 minute intervals at no incremental cost as compared to recording usage at hourly intervals. However, the bandwidth of the AMI communication network as well as the storage capacity of the Head End Data Collection Engine and Oracle MDM system would have to be expanded at an incremental cost to accommodate intervals more granular than hourly.

Duquesne Light does not believe these incremental costs are justified at this time since there are no existing requirements for interval data more granular than hourly. However, since expansion of network bandwidth and storage capacity is scalable, the Company proposes implementing an AMI system based on hourly interval data and then expanding it later if future applications

require more granular intervals. The Commission approved this aspect of the Company's Smart Meter Plan in its 2012 Order.

c. On-Board Storage Of Meter Data That Complies With Nationally Recognized Non-Proprietary Standards Such As ANSI C12.19 and C12.22 Tables

The ANSI C12.19 standard provides a common data structure for use in transferring data to and from meters. The ANSI C12.22 standard defines how to transmit standardized tables of meter data across wired or wireless networks. This standard uses encryption to enable secure communications, protecting confidentiality and data integrity.

The Company's AMI System will comply with these standards without any additional implementation costs.

d. Open Standards And Protocols That Comply With Nationally Recognized Non-Proprietary Standards, Such As IEEE 802.15.4

IEEE 802.15.4 is a communication standard for low rate wireless personal networks such as ZigBee. ZigBee has the ability to link smart meters with devices such as thermostats, household appliances, HVAC, lighting systems and other household appliances or systems.

The Company's AMI system will comply with the IEEE 802.15.4 standard without any additional implementation costs.

e. Ability To Upgrade Minimum Capabilities As Technology Advances And Becomes Economically Feasible

The capability is whether existing equipment can adopt or be modified to incorporate new capabilities as technology advances. Duquesne Light cannot predict all future needs or technologies. However, the Company is implementing an AMI system that is flexible and expandable. Moreover, Duquesne Light will be able to upgrade the software for its AMI system, including meter firmware and configuration.

f. Ability To Monitor Voltage At Each Meter And Report Data In A Manner That Allows An EDC To React To The Information

The AMI system that Duquesne Light is implementing will provide the capability to monitor voltage at each meter. This monitoring can be accomplished by establishing a register within the Smart Meter for voltage related interval data or by programming the Smart Meter to send an alert if the voltage measurements are outside a normal range.

Under the Amended Smart Meter Plan, Duquesne Light is proposing to install a Distribution Management System (DMS) that will be part of an ADMS to enhance its voltage monitoring capabilities. An ADMS is a combination of OMS and DMS (ADMS=OMS+DMS). The DMS with smart meter data will give Duquesne Light the ability utilize Volt/VAR Optimization, and to begin a transformer loading/replacement program. Additional benefits of a DMS are fault location and automated switching orders. Total electrical system benefits are estimated to reach approximately $2.285 million per year, of which Duquesne Light is estimated to realize $0.285 million per year.

g. Ability To Remotely Reprogram The Meter

Firmware within the meter controls all of the functions and capabilities of the meter. Firmware is the software that interfaces the meter's hardware and the network application, enabling the meter to perform its functions. The firmware in the Company's Smart Meters can be reprogrammed remotely through the communications network or at the meter.

There are no additional meter or network costs to be able to remotely program the Smart Meter's firmware.

h. Ability To Communicate Outages And Restorations

The AMI architecture provides the capability to communicate outages and restorations from the Smart Meter to the Head-End Collection system. This communication is based on a "last gasp" alert that the meter sends when it loses power along with a subsequent "first gasp" alert when power is restored. This functionality does not exist in Duquesne Light's existing AMR system.

In order to incorporate AMI outage and restoration alerts into the Company's real-time reliability and customer notification processes, Duquesne Light is proposing to replace its current Outage Management System ("OMS") as well as develop and maintain a distribution system "Electrical Model".

An electrical model houses data that makes up an electric distribution system and represents it on a geo-spatially correct digital map. An electrical model can be used for effective distribution planning and is the foundation for mobile mapping applications and systems such as OMS and DMS. In addition to smart meter alerts, the OMS will leverage Supervisory Control and Data Acquisition (SCADA), Intelliruptor technology, and FOCUS. The OMS will take outage information from these various sources and analyze the inputs using its predictive engine. Using OMS with smart meter information is expected to produce savings of up to $300,000 per year for the Company once fully implemented. The savings will be as a result a reduced number of phone calls taken at the call center due to customer outreach notifications of smart meter reporting of outages and restorations and increased efficiencies during and after storm events. Using an OMS is anticipated to reduce the average length of duration of power outages because operators will have quicker awareness of the number of customers affected by an outage and will be able to dispatch crews earlier to the larger outages. Reduced outage time results in reduced customer impacts.

i. Ability To Support Net Metering Of Customer Generators

Duquesne Light's Smart Meters will support net metering of customer generators. The ITRON Smart Meters will have multiple channels and bi-directional capability that will allow the Company to measure both the excess energy that is being generated by the customer and also measure energy that is delivered by the Company to the customer. The ITRON Smart Meters come equipped with this capability, and therefore, there are no additional costs to implement this capability.

F. AMI IMPLEMENTATION TIMELINE

1. System Wide Roll-Out

Under the Amended Smart Meter Plan, Duquesne Light is proposing to deploy smart meters for all customers by the end of 2019. This is one year earlier than what the Commission approved in the 2012 Smart Meter Plan. Accelerating deployment will allow the Company's customers to experience the benefits of smart meter technology sooner than what they would have experienced under the 2012 Smart Meter Plan. A chart showing the Company's revised AMI implementation timeline is provided as Appendix G. The Company anticipates that it will complete full deployment of its smart meters by the end of 2019.

In the 2012 Smart Meter Plan, the Commission approved a phased functional implementation of Smart Meter features starting with the most basic capabilities such as monthly billing from smart meter usage data and ending with the most advanced capabilities such as support for HANs. This phased functional implementation is designed to allow the market for many of the advanced smart meter capabilities to become more mature, which will then provide a better definition of the requirements. Requirements that are not fully defined result in rework, which ultimately results in additional costs for customers. Duquesne Light believes that this potential rework and associated costs can be avoided by our proposed phased functional implementation approach.

At the same time, however, the Company anticipates that much of the functionality throughout deployment will be valuable. The Company will integrate available functionality, to the extent it has been fully tested and accepted throughout the process, into business practices where possible. This will allow the Company to take advantage of the benefits early in the process. For example, the Company plans to integrate hourly data into its processes used for daily reconciliation and PJM settlements. Similarly, the Company plans to implement the remote connect / disconnect functionality in select areas as it become available. This extension of the phased-in approach of smart meter functionality throughout the deployment will ensure implementation obstacles are removed throughout the entire process rather than defer until the last stage of deployment. The Company and customers will be able to take advantage of the benefits of AMI as deployed throughout the service area.

The following table provides a high-level overview of Duquesne Light's proposed phased functional implementation approach by requirement.

Duquesne Final SMIP Plan

Type	Requirement	2014	2015	2016	2017
Basic	Commissioning and decommissioning of smart meters in the field	x			
Basic	Collection of usage data for billing and events such as tamper alarms	x			
Basic	Monthly billing from smart meter usage data	x			
Basic	Manual disconnects and reconnects	x			
ACT 129	Bi-directional data communications		x		
ACT 129	Record usage data on at least an hourly basis once per day	x			
ACT 129	Provide direct access to and use of price and consumption information				x
ACT 129	Provide customers with information on their hourly consumption		x		
ACT 129	Enable time-of-use (TOU) rates and real-time price (RTP) programs			x	
ACT 129	Automatic control of the customer's electric consumption				x
PA PUC	Remote disconnects and reconnects			x	
PA PUC	Provide 15-minute or shorter interval data			x	
PA PUC	On-board meter storage that comply with national standards	x			
PA PUC	Open standards and protocols	x			
PA PUC	Upgradable capabilities	x			
PA PUC	Voltage monitoring				x
PA PUC	Remote reprogramming of the meter		x		
PA PUC	Outages and restorations				x
PA PUC	Net metering of customer generators			x	

2. New Construction And Customer Requests

Pursuant to Act 129 and the Commission's *Implementation Order*, EDCs are required to deploy smart meter technology at the end of the 30-month grace period in new construction and upon customer request. As part of Duquesne Light's grace period planning efforts, the Company has designed interim solutions to comply with these deployments.

a. New Construction

Duquesne Light installs approximately 2,000 meters annually in new construction sites throughout its service territory. Duquesne Light has been installing ITRON smart meters at all new residential construction sites after the grace period and communicating with these meters through its existing AMR ITRON Fixed Network system. These meters will be transitioned to the new AMI system at the time that the new communication network is extended to these locations as part of the full deployment schedule. Smart meters that communicate through the AMR system will provide daily reads until they are transitioned to the AMI system at which time they will provide hourly reads and AMI functionality that is available at that time. The transition from the AMR system to the AMI system will be determined by the Duquesne Smart Meter Program full deployment schedule. Duquesne Light will continue to deploy Alpha meters that communicate through its existing AMR ITRON MV-90 system for all new commercial and industrial ("C&I") construction sites until the new communication network is extended to these locations as part of the full deployment schedule.

b. Customer Requests

The Commission approved the Company's 2012 Smart Meter Plan proposal for installing meters upon customer request. The Company is not proposing to change its Commission-approved procedures in this Plan. A summary of the Company's Commission-approved plan for installing meters upon customer request is below.

Since the enactment of Act 129 smart meter legislation in 2008, Duquesne Light has only received a few customer requests for a smart meter. To honor customer requests for direct access to un-validated usage data after the grace period, Duquesne Light is installing ITRON smart meters that communicate with its existing AMR ITRON Fixed Network system for billing

purposes but enable HAN connectivity through ZigBee for direct access purposes. To honor customer requests for next day access to validated hourly usage data through a web portal, Duquesne Light installs Alpha meters (currently used on C&I accounts) and communicates with them through its existing AMR ITRON MV-90 system for both billing and next day usage data access purposes. After the 2012 Smart Meter Plan was approved by the Commission, Duquesne Light has purchased, implemented and integrated the ITRON Head-End Data Collection Engine with the MDM. Customers that request a smart meter outside of the Company's full deployment schedule will be charged the incremental communication and deployment costs but not the cost for the meter. The Company will develop a fee for this scope and update Rule 14.2 of its tariff.

c. Customer Service Entrance Repairs

Under the Amended Smart Meter Plan, Duquesne Light requests Commission approval to make the necessary repairs to a customer's service entrance equipment that are necessary to allow the safe installation of the new AMI meter. Repairs will be limited to ensuring a safe and serviceable meter socket, and include repair and replacement of adjoining equipment only when necessary to ensure a safe and serviceable meter socket for the AMI meter installation. Performing these repairs in a timely and controlled manner is essential to the integrity of the network by ensuring gaps in the mesh do not exist that would prevent stable and consistent meter communications. Duquesne Light proposes to recover these costs through the AMI plan.

G. SMART METER PROGRAM COSTS

The estimated cost of the AMI Component of the Amended Smart Meter Plan is estimated at $257 million spent over an 11 year period beginning in 2010 and ending in 2019. The following table provides a breakdown of the total AMI estimated costs by scope component.

AMI Project Vendor Components (ITRON)	100
AMI Outside Services	71
AMI DLC Labor	37
AMI Hardware and Software	18
AMI Project Communication Network (WAN)	11
AMI Project Customer Acceptance	3
AMI Run Ops	10
Bill Ready / Rate Ready	7
ADMS	46 - 56
ADMS Run Ops	5 - 6
Total	319

The Company notes that this does not include FOCUS System costs which were included in base rates in the Company's 2013 base rate proceeding at Docket No. R-2013-2372129.

The Smart Meter Program planning costs encompass all of the grace period expenditures necessary to develop the Final Smart Meter Plan. A significant portion of these planning costs are the engagement of third party subject matter expertise such as SAIC, IBM and other

consulting resources. These planning costs also include the technology proof of concept with ITRON to prove the viability of the proposed AMI system solution.

The AMI Project WAN costs encompass all of the equipment and services described in Section C.4 of this Plan. These cost estimates are based on analysis, including preliminary propagation studies, conducted by Duquesne Light and ITRON with the assistance of SAIC.

The AMI Project IT Systems costs encompass all of the implementation and integration services described in Section D of this Plan. In some instances where it is cost justified, the third party delivery services may be replaced with the purchase of additional software and hardware products. These cost estimates are based on analysis conducted by Duquesne Light with the assistance of IBM.

The AMI Project Customer Acceptance costs encompass all of the work efforts described in Section I of this Plan. These cost estimates are based on analysis conducted by Duquesne Light with the assistance of Customer Performance Group ("CPG").

The Company notes that the total estimated project cost does not include a general project contingency component, which is typical for projects of this nature with four years of project implementation ahead of it. The Company will strive to complete the AMI project based on the estimated costs as set forth above. However, the Company also requests Commission approval of a $15 million contingency component to cover changes in scope or requirements, unforeseen cost increases or implementation complications. If such contingent circumstances arise, the Company proposes to inform the Commission of such circumstances and include the contingent costs in the SMC, subject to Commission review and refund. A further breakdown of the estimated costs for the FOCUS and AMI projects by year is provided in Appendix H.

H. SMART METER COST RECOVERY

In its Initial Smart Meter Plan the Company proposed to recover its costs to implement smart meter technology via a Section 1307 Smart Meter Charge. By order dated May 11, 2010, the Commission approved Duquesne Light's Initial Plan with certain modifications. In addition, the Commission approved the Company's SMC, with certain modifications, which provides for full

and current cost recovery of smart meter costs. The first SMC was implemented effective August 1, 2010.

The SMC uses a formula to calculate the revenue requirement for the quarter for each component. The SMC is updated quarterly, effective January 1, April 1, July 1 and October 1 each year. Common costs are then allocated to the revenue requirement for each meter type based on the number of each type of meter. A description of the SMC is provided in Rider No. 20, Smart Meter Charge, of the Company's retail tariff.

The formula to compute the revenue requirement for single phase, three-phase and common plant each includes four primary components. The first component is the pre-tax return on average projected net plant in-service ("PIS") for the upcoming quarter. Net PIS includes eligible smart meter plant and supporting systems adjusted for accumulated depreciation and accumulated deferred income taxes associated with that plant. The second component of the revenue requirement includes the projected expenses for depreciation, operation and maintenance for the upcoming quarter. The third component is an adjustment to the revenue requirement made for expected operating cost savings, if any, realized by the Company by implementing smart meter technology. The fourth component is a reconciliation adjustment, developed through an annual filing, to reconcile for the actual revenue requirement for the previous reconciliation year versus the billed revenue for the same period.

The revenue billed under the SMC for each quarter of the reconciliation period is compared to the actual revenue requirement calculated for each quarter using actual data for each of the four components of the formula. The over or under collection of revenue is recouped or refunded as appropriate with interest over a one year period beginning on January 1 of the following year. All over and under recovery calculations include interest at the legal rate of 6%.

In the 2012 Smart Meter Plan, the Company proposed to continue to recover the costs for implementing its Smart Meter Plan through its existing SMC without modification. This was approved by the Commission. The Company proposed to continue to recover its AMI Costs through the SMC.

I. CUSTOMER EDUCATION AND ACCEPTANCE STRATEGY

1. Introduction

The Company's Customer Education and Acceptancy Strategy was approved under the 2012 Smart Meter Plan. A description of this strategy is below.

In early 2011, Duquesne Light engaged Customer Performance Group (CPG) to assist the company with development of a strategy that minimizes the risk of customer resistance to smart meter technology that many utilities throughout the country have previously experienced. CPG has worked with several utilities in California, Nevada and Illinois to successfully deploy smart meters in a manner that increases customer awareness, understanding and confidence with the new AMI technologies. A primary component of the customer confidence model is the communication of AMI technology benefits to customers soon after they receive their new smart meter.

As part of our planning efforts with CPG, we identified several new enhanced products and services such as Bill-to-Date reporting, Usage threshold alerts, Usage graphs, TOU rates, and RTP programs that are all facilitated by leveraging the investment in AMI technologies. Duquesne Light will offer select, cost-effective enhanced products and services for our customers that also provide transactional benefits to the company. These services are designed to increase customer participation and acceptance of smart meter technology. Additionally, The CPG deployment approach also strives to minimize customer inconvenience and provide a neutral, if not positive overall customer experience related to smart meters.

2. Target Audiences

Duquesne Light's three primary target audiences are employees, stakeholders and customers. A description of these three audiences and their relationships to smart meter technology is below:

Audience	Role
Employees	
Installers	Installers install the smart meters. They have customer contact prior to installation and when the work is completed.
Field Liaison	The field liaison is a person skilled in energy audits who interacts with and provides door-to-door outreach to customers and troubleshoot customer complaints.
Call Center	The call center provides customers information and education regarding smart meters and processes customer complaints and claims.
Other	All other employees serve as ambassadors who can explain the smart meter system to family, friends, and neighbors.
Stakeholders	
Elected Officials and Staff	Elected officials and their staffs are a source of information about the smart metering system for constituents and a channel for receiving customer complaints.
Community Leaders	Community leaders include political organizations, special-interest organizations, business organizations, service organizations, faith-based organizations, and schools. They act as third-party communicators to customers.
Media	Media includes representatives of newspapers, television, and radio who communicate with customers.
Electric Generation Suppliers (EGS)	EGS's are the retailers who sell the electric commodity to customers and may develop new products and services based upon the smart metering system.
Curtailment Service Providers (CSPs)	CSPs provide energy and demand response products to encourage customers to curtail usage at times of peak load.
Service Providers	Service providers include contractors, electricians, aggregators, and others who act on behalf of customers and provide information to customers about electric appliances and services.
Union Leaders	Union leaders are the representatives of DLC employees who are represented under collective bargaining agreements. They act as third-party communicators to employees.
Customers	
Residential	Residential customers include customers who live in single-family and multi-family premises who take service on rates RS, RH, and RA.
Commercial and Industrial (C&I)	C&I customers include those who take service on rates GS/GM and GMH.

3. 90-60-30 Day Communication Strategy

Duquesne Light's CEA plan focuses on the creation of a neutral-to-positive customer experience. The foundation of this customer experience is the 90-60-30 day strategy. 90-60-30 refers to the number of days prior to installing a smart meter during which specific information, education, and customer experience tactics are implemented. As part of the communication strategy, Duquesne Light has created a dedicated AMI website which contains frequently asked questions, informational fact sheets, the current deployment schedule and meter exchange process along with customer benefits. The website can be found by clicking on the Meter Exchange Program icon at the bottom of the Duquesne Light.com homepage. In addition to its website, Duquesne Light communicates with its customer by an advanced notification of meter exchange letter and automated reminder calls.

90 Days. At least 90 days before installing smart meters in a specific community or geography, Duquesne Light will:

1. Update the DLC AMI website with current information related to deployment and other relevant information about the smart meter system.
2. Continue to educate employees about the smart meter system and its deployment.
3. Continue to educate stakeholders about the smart meter system and deployment.

Duquesne Light's approach for employees will be to provide information and education so that all employees can act as advocates for the smart meter system. To achieve this objective, Duquesne Light will use a variety of methods to build employee awareness and understanding. These methods may include:

- Town hall meetings
- Training classes
- Internal newsletters
- Office signage
- Employee intranet

- *Involving employees in testing smart meter products and services*

For front-line employees, Duquesne Light will employ additional educational methods that teach specific skills associated with the employee's job role. This may include advanced training classes for call center representatives, field liaisons, and installers, and briefings for field liaisons and installers.

Duquesne Light's approach for stakeholder education will be one of personalized meetings, group presentations, and events (such as stakeholder collaboratives). Duquesne Light will support these activities with collateral materials, props, videos, and demonstrations of smart meter services.

60 Days. Approximately 60 days before deploying smart meters in a specific region, Duquesne Light will conduct outreach events and presentations for both residential and business community members. The media Duquesne Light plans to use for community outreach includes PowerPoint presentations, trade show-style booths, and a mobile. The likely venues for these outreach presentations include community groups (Chambers of Commerce, Rotary, citizens' councils, political groups), homeowners' associations, and community. Content presented during these events will focus on features and benefits, function (how the system works), and confidence (accuracy, security, privacy, health, and value). To increase participation in these community presentations, Duquesne Light may use paid and non-paid media to generate interest and awareness.

30 Days. Thirty days before installing a smart meter at a customer's premises, Duquesne Light will implement a targeted direct media campaign. The first element is a direct mail letter which informs customers of the forthcoming smart meter installation. It also provides the customer information about the function, benefits, and confidence associated with the smart metering system. All communication materials will include Duquesne Light's call center website address and phone number for additional information

Within five days before deploying meters at a customer's premises, customers will receive an automated phone call and/or email reminding them of the smart meter installation. This

communication will remind customers of upcoming the meter exchange and provide Duquesne Light's toll free number to call if they have questions.

At the time of installation, installers will perform the installation according to a customer experience script (knock, explain, install, and leave record of work). A Duquesne Light field liaison will be available to provide on-call support to the meter exchange employees and/or customers or.

Five days after installation Duquesne Light will survey a sample of customers regarding installation satisfaction and their attitudes toward the smart metering system (as compared to the baseline survey).

Thirty five days after installation, all customers who have not opted out of the third party data transfer necessary to provide customers with web presentment will receive notification that their smart meter benefits (bill-to-date, bill alerts, projected bill, and hourly usage data) are now available to them online. Customers must create a login for Duquesne Light's My Electric Use service to gain access to the web presentment of their smart meter benefits.

4. Measuring Success

The measure of success for a smart meter deployment project is a neutral-to-positive customer experience. Duquesne Light will measure the success of its customer experience and education efforts through three specific methods.

As part of the 90-60-30 implementation strategy, Duquesne Light will track the:

- Number of website visits it receives
- Number of calls it receives from customers
- Classification of those calls in appropriate categories such as complaints, claims, high bill, and opt out.

Subsequent analysis of the volume and type of these calls will enable the Duquesne Light to maintain or adjust its customer experience, customer education, and customer support efforts.

Additionally, Duquesne Light will collect customer feedback during outreach presentations regarding customer attitudes toward the smart meter system.

Five days after the installation of smart meters, Duquesne Light will survey a sample of customers regarding their satisfaction with the installation experience. Analysts will integrate the survey results into a weekly dashboard report for Duquesne Light. This report will guide Duquesne Light in taking appropriate action to correct deficiencies in the customer experience.

J. RISK MITIGATION STRATEGIES

Duquesne's Smart Meter Program is a multi-year, multi-million dollar endeavor that will greatly impact several key stakeholders including our customers and employees. Therefore, a large part of the grace period planning effort has been spent identifying program risks as well as developing strategies for mitigating the impact of these risks. Duquesne's risk mitigation strategies include:

- Engaging Industry Subject Matter Expertise throughout the planning effort
- Commissioning an AMI Technology Proof of Concept (POC)
- Instituting a ramp-up period along with a phased functional implementation within the Smart Meter Program deployment schedule
- Development of a Customer Acceptance Strategy aligned with the PA PUC Retail Market Investigation (RMI) Directives
- Engagement of an experienced Systems Integrator to own the end-to-end integration between the FOCUS and AMI projects

Industry Subject Matter Expertise

As a first step in our Smart Meter Program planning effort, Duquesne issued a Request for Proposal (RFP) in order to obtain the services of a utility industry advisor with extensive planning experience for AMI technology projects. R.W. Beck, Inc. (now SAIC) was selected for this advisory role and assisted Duquesne with our milestone flings as well as with our AMI vendor RFP process and AMI communication network extended analysis. Duquesne has also engaged industry subject matter expertise during our contract negotiations with ITRON. Eckert Seamans is providing external legal counsel while IBM is providing contract assistance from a

business risk assessment perspective. IBM was also engaged to provide Duquesne with "lessons learned" from other Smart Meter Programs where they have served as the Systems Integrator as well as to assist Duquesne with developing our systems integration cost estimates for the AMI project. Finally, Customer Performance Group (CPG) is assisting Duquesne with development of a customer acceptance strategy designed to minimize the risk of customer backlash against smart meters that other utilities throughout the country have previously experienced.

AMI Technology Proof of Concept

In the latter half of 2011, Duquesne entered into a one year contract with ITRON to conduct an AMI Technology Proof of Concept (POC). This POC enables Duquesne to test the various components of the AMI System outlined in section IV of this plan. The POC is designed to validate the following data.

- Meter configurations/settings
- Captured interval data using ITRON AMI Service Test
- Captured event messages/alerts/alarms in the ITRON OpenWay Collection Engine
- Firmware download using the ITRON OpenWay Collection Engine
- On demand reads; remote disconnects and reconnects using ITRON AMI Service Test

In addition to testing the ITRON OpenWay components of Duquesne's proposed AMI System, this POC will also test various AMI communication network solutions. The scope of the POC is 36 residential meters and 16 commercial meters. These meters are installed in a dual-socket environment so that the customer's existing meter is still used for production billing purposes. The POC local area network (LAN) consists of four cell collectors and two range extenders. The POC wide area network (WAN) utilizes various private wireless solutions for intermediate transmittal to Duquesne owned communication towers as well as public wireless solutions for direct connect functionality. As part of the POC, Duquesne is also performing laboratory tests on several Home Area Network (HAN) devices. These devices include:

- Two Smart Thermostats

- Two In-Home Displays (IHDs)
- Two Load Control Devices

Ramp-up Period and Phased Functional Implementation

In order to minimize the risk of any potential unforeseen technology glitches having a mass negative impact on our customers, Duquesne is proposing a ramp-up period for Smart Meter deployments. This period will begin with a 5,000 smart meter acceptance roll-out in the latter half of 2014 followed by a gradual build-up to a full. In addition to the ramp-up period, Duquesne is proposing a phased functional implementation of Smart Meter features starting with the most basic capabilities such as monthly billing from smart meter usage data and ending with the most advanced capabilities such as support for Home Area Networks. This phased functional implementation is designed to allow the market for many of the advanced smart meter capabilities to become more mature, which will then provide a better definition of the requirements.

Customer Acceptance Strategy

In early 2011, Duquesne engaged Customer Performance Group (CPG) to assist the company with development of a strategy that minimizes the risk of customer backlash against smart meters that many utilities throughout the country have previously experienced. CPG has worked with several utilities in California, Nevada and Illinois to successfully deploy smart meters in a manner that increases customer awareness, understanding and confidence with the new AMI technologies. Duquesne Light's Customer Acceptance Strategy is explained in more detail in Section I above.

System Integrator

As explained in Section D above, Duquesne's Smart Meter Program has four levels of complex systems integration that must work both independently as well as in conjunction with each other in order for the entire solution to function properly. The Company believes that the success of our AMI project is highly dependent on engaging an SI that has utility industry experience with both AMI technology projects as well as with Oracle Utility Application Suite implementations.

IV. CONCLUSION

As explained herein, Duquesne Light has been implementing billing system and information technology changes that are necessary to provide customers with Smart Meter Technology. In addition, Duquesne Light has been carefully and thoroughly investigating ways to meet the Act 129 Smart Meter Technology requirements. Duquesne Light requests Commission approval of its Amended Smart Meter Plan as set forth herein and in the Company's Petition and supporting testimony.

Bill to Date and Projected Bill

Service Category	Bill
Classification	AMI Project
Channel(s)	Web
Source	Internal or 3rd party vendor
Author	Peter Honebein
Owner	Dave Defide
SMEs	Dave Defide and Kevin Baden
Created	August 22, 2011
Last Modified	July 31, 2015

Description

The Bill-to-Date and Projected Bill feature displays the following information to customers on the DLC website:

- Number of days in the billing cycle
- Estimated bill-to-date, in dollars
- *Projected bill, in dollars, with an estimated range.*

Projected
electricity cost:

$170

Based on the last 21 days: $110

Projected for:
June 1 – 30

You typically spend:

$130

What can I do?

Figure 1: Example of bill projection from the Duquesne Light MyElectricUse website. Data shown in example is for illustration purposes only.

User Requirements

1. The customer shall be able to view bill-to-date through a secure, self-service web interface.
    A. The website shall display the bill-to-date feature on the customer's online account home page.

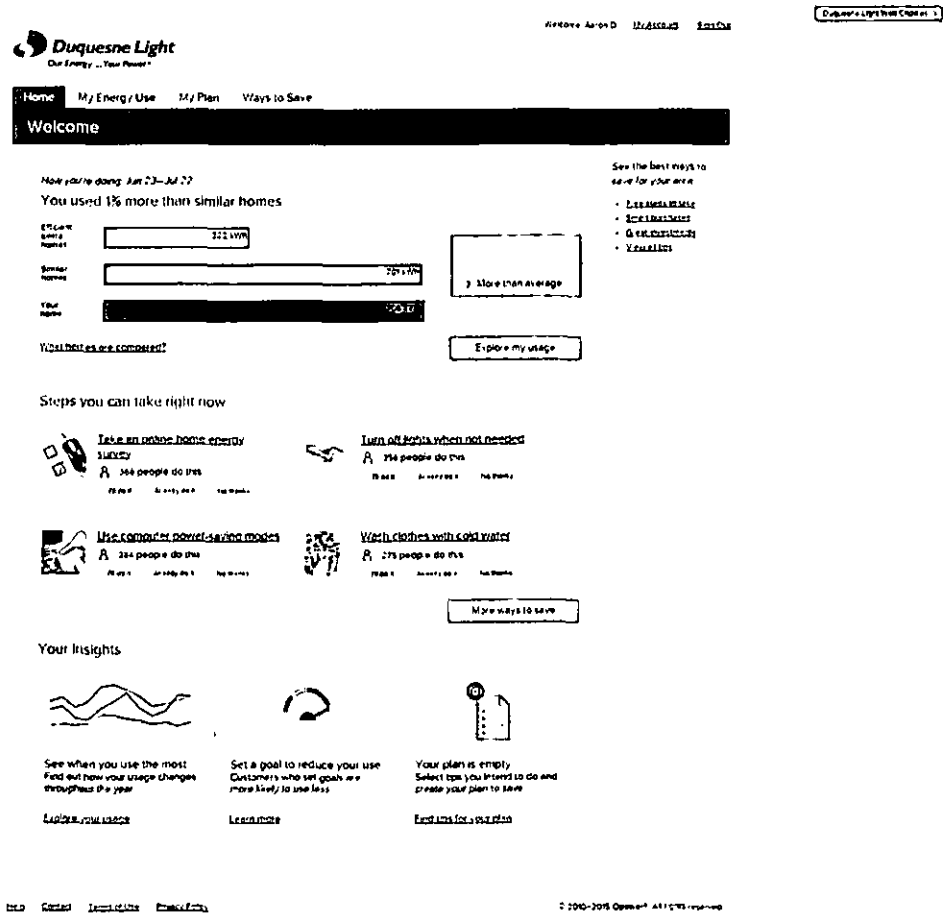


Figure 2: Example customer home page from the Duquesne Light MyElectricUse website. Data shown in example is for illustration purposes only.

I. The bill-to-date feature shall display the number of days in the billing cycle.
II. The bill-to-date feature shall display the estimated cost to date.
    a. The estimated cost to date should include the distribution and supply costs.
III. The bill-to-date feature shall display the projected bill for the billing cycle.
    a. The projected bill is an estimate taking into account current and historical usage over the time period.
    b. The projected bill shall decrease as the number of days in the billing cycle increases.
IV. The bill-to-date feature must be updated with the prior day's usage data by 12pm.
V. The bill-to-date feature shall be displayed esthetically following generally accepted graphic design principles.
VI. The customer shall be able to identify the bill-to-date feature on their account's homepage.
    a. The customer shall be able to interpret the information contained within the bill-to-date feature.

B. The customer shall be able to display help information that explains the bill-to-date feature.
    I. The help information shall explain how the estimated cost is calculated.
    II. The help information shall explain how the projected bill range is determined.

2. The FOCUS system shall display the bill-to-date information on the customer's record.
    A. A CSR shall be able to access a customer's bill-to-date information in less than five seconds.
    B. A CSR shall be able to state to the customer their bill-to-date information.

Future Scope (not included in AMI Project)

- Add Mobile and IVR channels

Bill Alerts

Service Category	High Bill
Classification	AMI Project
Channel(s)	CSR, Web, Phone, E-mail
Source	Internal or 3rd Party
Target Audience	RS, RH, RA, GS/GM
Author	Peter Honebein
Owner	Customer Care
SMEs	Dave Defide, Kevin Baden
Created	October 11, 2011
Last Modified	July 31, 2015

Description

A bill alert is a phone or e-mail notification sent by DLC to a customer (residential or commercial) under *these conditions:*

- When usage (in kWh) exceeds a specific threshold, which will be established by Duquesne Light based on best practices, determined through user research. The customer's specific threshold will change on a monthly basis as a result of their historical usage pattern and the threshold % set by DLC.
- When cost (in $) exceeds a specific threshold, which will be established by Duquesne Light based on best practices, determined through user research. The customer's specific threshold will change on a monthly basis as a result of their historical usage pattern and the threshold % set by DLC.
- When demand (kW) exceeds a specific threshold, as specified by the customer (future feature)
- When Power Factor (PF) exceeds a specific threshold, as specified by the customer (possible future feature)

Customers are automatically enrolled in email high bill alerts once they have a smart meter installed and an email is on file. The customer can opt-in to receiving phone alerts, or change an email address in a self-service fashion using the My Account tab.

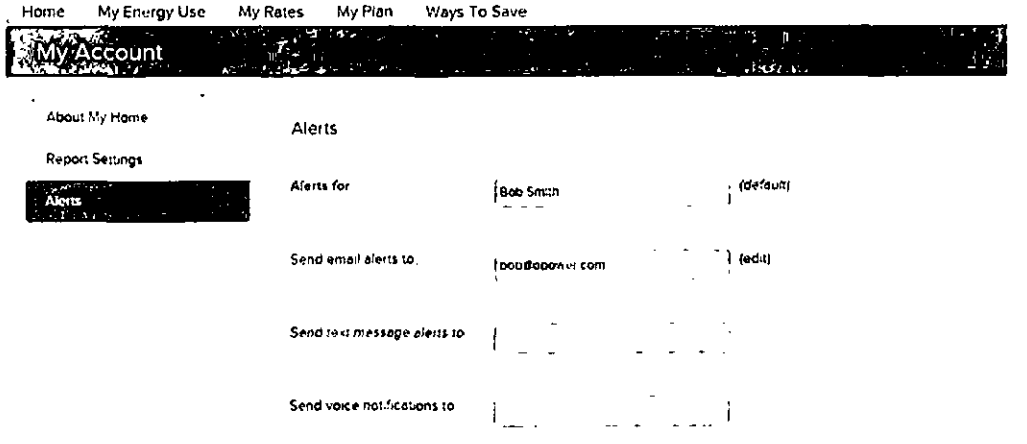
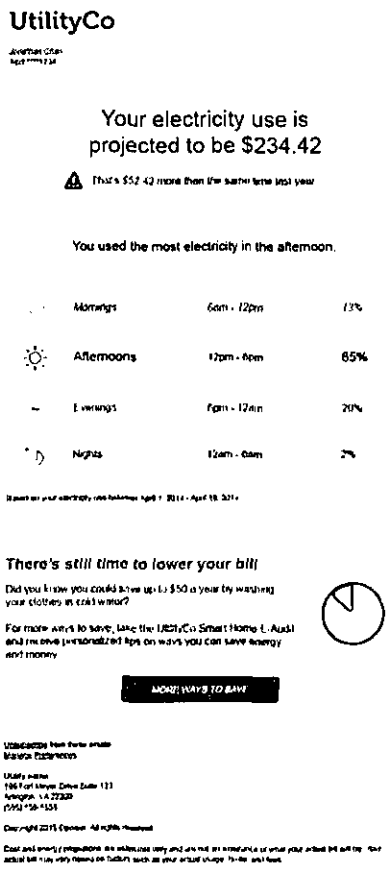


Figure 1: Example of customer notification preference section from the Duquesne Light MyElectricUse website. Data shown in example is for illustration purposes only.

Alerts are generated automatically by the system when the customer's usage forecast exceeds the threshold determined on a per-customer basis by their historical usage and DLC's threshold.



UtilityCo

Your electricity use is projected to be $234.42

You used the most electricity in the afternoon.

Mornings	6am - 12pm	13%
Afternoons	12pm - 6pm	65%
Evenings	6pm - 12am	20%
Nights	12am - 6am	2%

There's still time to lower your bill

Did you know you could save up to $50 a year by washing your clothes in cold water?

For more ways to save, take the UtilityCo Smart Home E-Audit and receive personalized tips on ways you can save energy and money.

MORE WAYS TO SAVE

Figure 2: Example of a high bill alert email from the Duquesne Light. Data shown in example is for illustration purposes only.

User Requirements

1. The customer shall be able to manage bill alerts through a secure, self-service web interface.
    A. The customer shall be able to view customer education regarding the bill alert feature.
    B. The customer shall be able to turn bill alerts on and off.
        I. The customer shall be able to specify alternative email addresses and telephone numbers for receiving alerts.
        II. The customer should be able to designate other people (family members, relatives, roommates) who should receive alerts.
    C. The alert is triggered whenever the customer exceeds the threshold which is established by Duquesne Light, based on best practices, determined through user research.
    D. DLC CSR's will be able to view the historical bill alert on the CSR tool at the customer's request.
        I. The list should include phone and email alerts.

2. DLC CSRs shall be able to manage bill alerts for customers.
    A. DLC CSRs shall be able to explain bill alerts to customers.
        I. DLC CSRs shall be able to configure bill alerts to customers.

3. The system shall send the customer a bill alert for those customers that exceed their threshold. The alerts are generated only on weekdays, and within a delivery window of DLC's choosing.
    A. The system shall determine if a bill alert condition is "true".
        I. A bill alert shall reflect usage through the prior day
        II. A bill alert shall reflect dollars through the prior day
    B. Each bill alert type (kWh, dollars) shall have its own unique message.
        I. Each bill alert media (phone, e-mail) shall have its own unique message.
            i. The message shall display content such as bill-to-date, usage-to-date, projected monthly bill and number of days into bill cycle.
            ii. The dollar amount in the bill alert message should include the distribution and supply costs.
        b. DLC should be able to edit bill alert messages.
        c. Email alerts shall include text, graphics, and URL links.
            i. The customer shall be able to click a link in a bill alert email to access information related to that link.
                1. The email shall include a link to the bill alert modification screen.
                2. The email should include links to related DLC services.
        d. Customers shall not be able to reply to a bill alert email.
        e. Bill alert messages shall mask personal identifiable information.
4. The system shall be able to generate a results report for confirmations and/or alerts for any *given time period.*
    A. The report should provide summary statistics regarding the total number of customers eligible to receive alerts, the number of customers receiving bill alerts, the type of alert, and the type of alert media.
        I. The customer should be able filter the report by various criteria, such as rate class.
    B. The report should include number of messages sent.
    C. The report should include number of messages returned as undeliverable.
        I. The report should list the specific customer accounts that had undeliverable messages.
        II. The system should generate a letter not notify customers regarding their undeliverable alerts.
    D. The report should include success and/or failure percentages.
    E. The report should include the number (by type) of click-throughs for links included in on the bill alert.

Future Scope (not included in AMI Project)

- Add notifications/alerts for demand and power factor.

Smart Meter Usage Data Display

Service Category	Information - Usage
Classification	AMI Project
Channel(s)	Web
Source	Internal and 3rd Party
Target Audience	RS, RH, RA, GS/GM
Author	Peter Honebein
Owner	IT
SMEs	Dave Defide, Kevin Baden
Created	October 15, 2011
Last Modified	July 31, 2015

Description

Smart meters collect usage data in 60, 30, or 15 minute increments. This data, along with the cost, pricing, and temperature information associated with that data, can be used by CSRs and customers to perform these important tasks:

- Discover the causes of high energy usage.
- Discover the costs associated with high energy usage.
- Analyze the causes of a high bill.
- Determine whether one is effectively shifting usage to other times of the day.

The primary method of presenting this data and information to customers is through smart meter usage graphs. These graphs typically present bar or line charts of usage and costs. Below is a sample of what a Duquesne Light customer will see when the access their dedicated web portal.

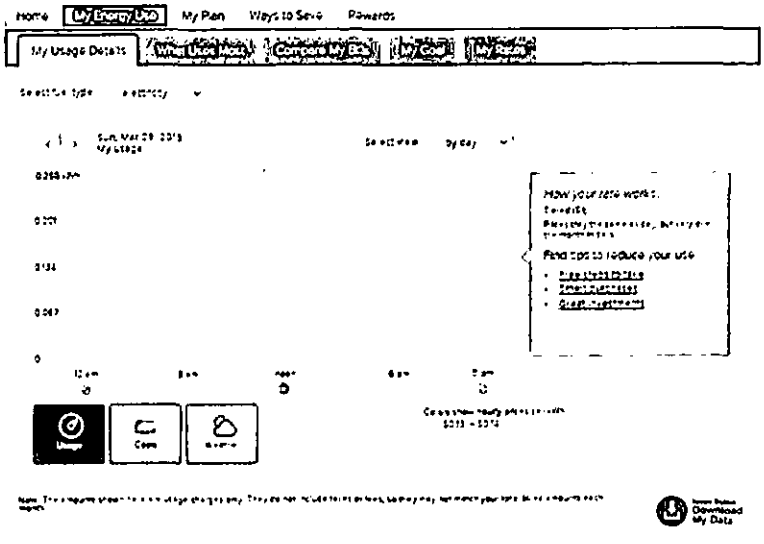


Figure 1: Example of energy use by day from the Duquesne Light MyElectricUse website. Data shown in example is for illustration purposes only.

Customers will have access to smart meter usage graphs that will provide a very flexible user experience. The graph (Figure 2 below) may provide the user the ability to:

- Specify a time range, by year, bill, or day.
- Overlay comparisons.
- Zoom, pan, and scroll.

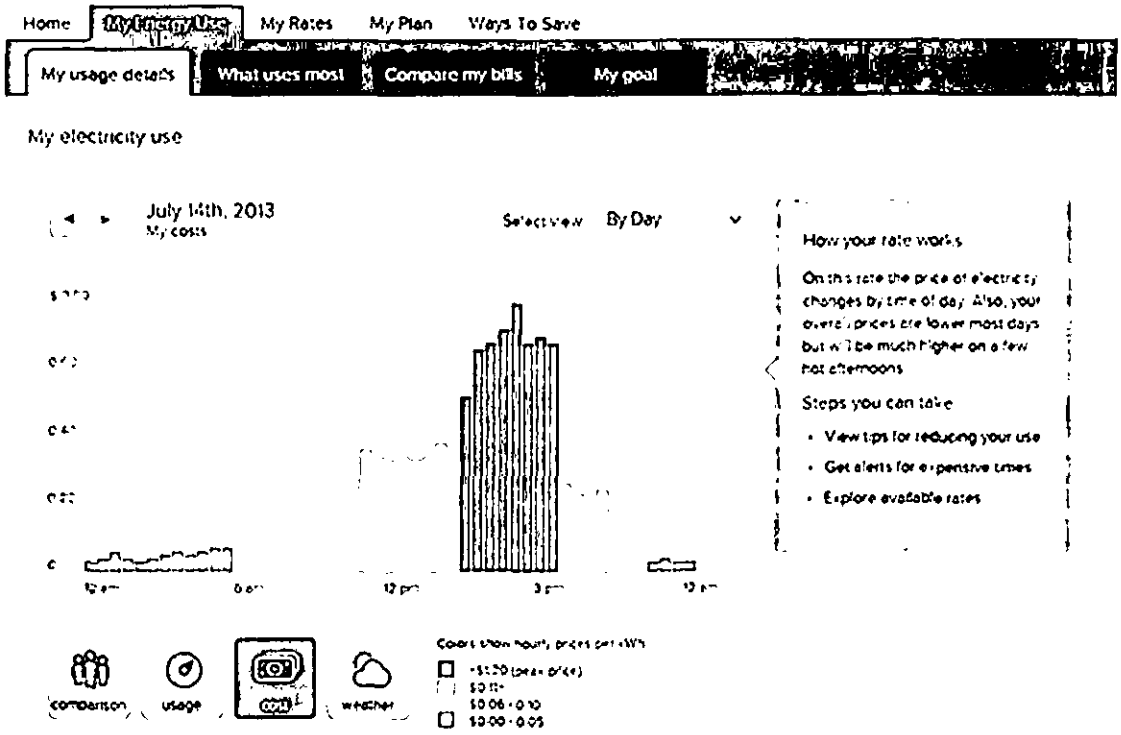


Figure 2: Example of energy use costs by day from the Duquesne Light MyElectricUse website. Data shown in example is for illustration purposes only.

User Requirements

1. The smart meter data displayed in the smart meter usage graphs shall reflect information up to 11:59pm the prior day.
    A. The data shall be available for display by 12pm the next day.
        I. Example: Data from October 19, 12am to 11:59pm is available for display by 12pm October 20.
2. A customer shall access smart meter usage graphs through a secure online web browser.
3. A DLC CSR shall access smart meter usage graphs for a customer's account through a secure online browser.
    A. A DLC CSR shall be able to use the graphs to analyze high bills.
    B. A DLC CSR shall be able to explain the graphs to a customer.

4. A customer whose account is associated with one or more premises or one or more meters shall be able to select the premise or meter they want to view.
5. The system shall display interval usage, cost, temperature, and rate data in a graph.
    A. The graph type is dependent on the type of information displayed. A customer can download their information using the Green Button feature at the bottom of the page and create graphs per their needs.
        I. The graph could be a bar chart.
        II. The graph could be a line chart.

    B. The customer shall be able to specify the type of usage and cost data in the graph.
        I. A type of usage and cost data shall be actual.
        II. A type of usage and cost data shall be estimated (If actual is not available).
        III. A type of usage and cost data shall be by rate period (e.g. on-peak and off-peak).
    C. The customer shall be able to specify the time period to display in the graph.
        I. The time period shall include common time designations.
            a. A designation should be by year(s)
            b. A designation should be by month(s)
            c. A designation should be by billing cycle(s)
            d. A designation should be by week(s)
            e. A designation should be by day(s)
            f. A designation should be by hour(s)
            g. A designation shall be by interval(s) (if less than 60 minutes)
        II. The time period shall be a range of MM/DD/YY, HH:MM to MM/DD/YY, HH:MM.
            a. The customer shall be able to set the time period.
        III. The graph should allow the customer to scroll forward or backward in time.
        IV. The graph should allow the customer to zoom in and zoom out.
    D. The customer shall be able to specify the data to display in the graph.
        I. The data shall be usage, in kWh.
        II. The data shall be cost, in dollars and cents per kWh.
        III. The data shall be temperature, in Fahrenheit or Celsius.
    E. The customer shall be able to hover the cursor over an element in the graph to display a tool-tip containing information about the element.
        I. Tool-tip should contain the date the element represents.
        II. Tool-tip should contain the time the element represents.
        III. Tool-tip should display the usage the element represents, in kWh.
        IV. The tool tip should display the cost the element represents, in dollars and cents.
        V. The tooltip should display the temperature the elements represent.
    F. The customer should be able to double click a data element in a graph (e.g. bar, line) to zoom into the data represented by that element.
        I. The customer shall be able to navigate back to the prior view in one mouse click.
    G. The customer should be able to include comparisons in the graphs.
        I. A comparison should be meters or premises associated with the account.
        II. A comparison should be one time period compared with another time period.
        III. A comparison should be cost for one time period compared with another time period.
        IV. A comparison should be average cost for kWh.
        V. A comparison should be a savings goal (e.g. 5% reduction).

VI. A comparison should be a load shape.
VII. A comparison should be temperature.
VIII. A comparison should be similar homes or businesses.
    a. The comparison could be based on premise type.
    b. The comparison could be based on NAICS code.

6. The customer shall be able to export an Excel or tab-delimited file containing the data associated with the displayed graph.
7. The customer should be able to copy a graph to the clipboard.

Future Scope (not included in AMI Project)

- None.

Web Dashboard

Service Category	Information - Usage
Classification	AMI Project
Channel(s)	Web
Source	Internal or 3rd Party
Target Audience	RS, RH, RA, GS/GM
Author	Peter Honebein
Owner	IT
SMEs	Dave Defide, Kevin Baden
Created	October 15, 2011
Last Modified	July 31, 2015

Description

A web dashboard is a screen that displays a summary of the customer's account. The dashboard is typically comprised of a number of configurable components or "gadgets" that display or summarize the customer's bill, usage, comparisons, and so on. Other gadgets perform analyses and task, such as an energy audit or a rate comparison. An example dashboard is shown below.

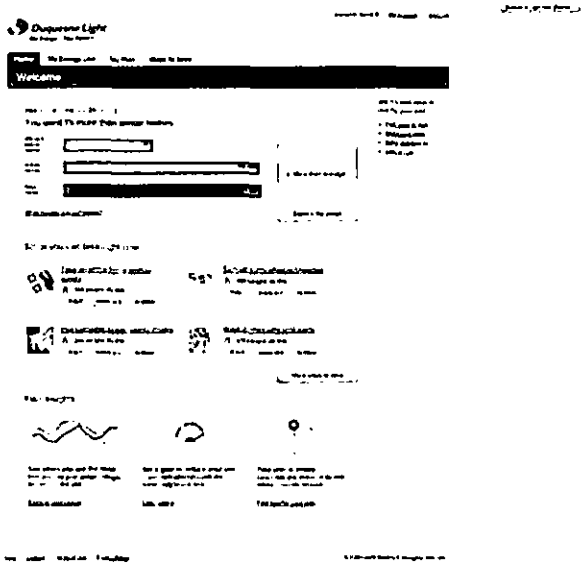


Figure 1: Example of Duquesne Light's homepage from the Duquesne Light MyElectricUse website. Data shown in example is for illustration purposes only.

User Requirements

1. The dashboard shall display information up to 11:59pm the prior day.
    A. The data shall be available for display by 12pm the next day.
2. The web dashboard shall be part of Duquesne's corporate website.
    A. The web dashboard shall have a look and feel that aligns with Duquesne's corporate website.
3. The customer shall log in with a username and password to access the dashboard.
4. The dashboard shall display a collection of gadgets.

A. A gadget shall be bill-to-date.
B. A gadget shall be smart meter usage graphs.
    I. The customer shall be able to view the smart meter graphs (*See Smart Meter Usage Graphs feature description*)
C. A gadget shall be account summary.
    I. The customer shall be able to manage their account information.
        a. The customer shall be able to edit their customer profile.
D. A gadget shall be alert/notifications.
    I. The customer shall be able to configure and reconfigure alerts and notifications (*See Bill Alert feature description*)
E. A gadget shall be web how-to's.
    I. The customer shall be able to view a list of how-to topics.
        a. The user should be able to sort the list of topics.
        b. The user should be able to filter the list of topics.
        c. The customer shall be able to view a specific how-to topic in html and/or .pdf.
F. A gadget should be event log.
    I. The customer should be able to view a list of events (e.g. notifications and alerts).
        a. The customer should be able to view the content of the event message (*See Bill Alert feature description*)
G. A gadget shall be energy audit.
H. A gadget shall be rate comparison.
I. A gadget should be home (or business) comparison.
J. A gadget should be daily and monthly usage.
K. A gadget should be bill highlights.
L. A gadget should be usage comparison (e.g. month this year compared to month last year).

5. The dashboard shall have a default layout of gadgets.
    A. The customer (or user) should be able to customize the dashboard for their username.
        I. The customer should be able to hide and show gadgets.
        II. Changes to the dashboard shall persist from one login to the next.
6. The customer shall be able to access help regarding gadgets and their elements.
    A. The customer should be able to hover the cursor over any gadget or element to display a tool-tip containing information, tips, or education about the gadget or element.
    B. The customer shall be able to display online help information for a specific gadget.
7. The dashboard may display information related to other DLC programs and services.

Future Scope (not included in AMI Project)

- None.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF DUQUESNE LIGHT COMPANY FOR APPROVAL OF AMENDMENT TO ITS SMART METER TECHNOLOGY PROCUREMENT AND INSTALLATION PLAN

Docket No. M-2009-2123948
P-2015-_____

DIRECT TESTIMONY

Witness: Brian J. Novicki

Subject: Smart Meter Deployment, Functionality and Cost.

August 4, 2015

Direct Testimony of Brian J. Novicki

I. INTRODUCTION

Q. Please state your full name and business address.

A. My name is Brian J. Novicki. My business address is 411 7th Avenue, Pittsburgh, PA 15219.

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

A. I am Manager, AMI Deployment for Duquesne Light Company ("Duquesne Light" or "Company").

Q. What are your qualifications, work experience and educational background?

A. I have more than 35 years of diversified work experience in electric utility metering systems. Over these years, I've held staff, supervisory and managerial positions in metering technical services, construction, field metering operations and customer data systems at various electric utilities in Pennsylvania. In my current role as Manager, AMI Deployment at Duquesne Light, I am responsible for overseeing the implementation and deployment of the Company's Advanced Metering Infrastructure ("AMI") system. I attended California University of Pennsylvania for course work in Business Management and Computer Science, and Point Park University in Pittsburgh for course work in Electrical Engineering Technology.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is two-fold. First, I will provide an overview of the proposed revisions to the Company's Commission approved *Final Smart Meter Procurement and Implementation Plan* (hereafter "2012 Smart Meter Plan"), including but not limited to, changes in the meter deployment schedule and smart meter functionality implementation. Second, I will provide an overview of the updated cost estimates for Duquesne Light to deploy smart meter functionality, including bill ready and rate ready functionality, and ongoing meter operations and support.

II. BACKGROUND

Q. Please summarize the history of Duquesne Light's Smart Meter Plan.

A. The Company's 2012 Smart Meter Plan was approved by the Pennsylvania Public Utility Commission ("Commission") on May 6, 2013. As described in the 2012 Smart Meter Plan, Duquesne Light's smart meter project included two major components: the FOCUS project[1] and the Advanced Metering Infrastructure ("AMI") project. While significant work had been completed to develop the Company's 2012 Smart Meter Plan, certain aspects of the plan were not complete, such as finalizing some vendor contracts and defining a detailed project plan. Upon receiving Commission approval in 2013, the Company began working to secure vendor contracts and develop a more detailed project

[1] Although collectively coined the FOCUS project, the project includes the upgrade, implementation and integration of several major systems such as the new CC&B system, a new Service Oriented Architecture, Meter Data Management system, Workforce Management system, Market Transaction Messages and Interactive Voice Response, among other things. The FOCUS project was necessary, in part, to implement smart meter technology.

plan. In 2014, the FOCUS project[2] was completed, along with the deployment of the 5000 advanced meters in the Bellevue area. Full deployment of advanced meters began 2015, with activation of the advanced metering communications network June of 2015.

Q. What is the current status of the Company's AMI deployment?

A. The Company's AMI project consists of four components: 1) smart meters, 2) local area network ("LAN"), wide area network ("WAN') and the Head-End Collection System. The Company's AMI project implementation is currently on schedule. The Company will have approximately 150,000 smart meters[3] installed by January 1, 2016, and expects to have installed approximately 200,000 smart meters by June 1, 2016. The Company has installed 113 LAN Data Aggregation Points ("DAPs") and 13 WAN towers. The Head-End Collection System was implemented in June 2015. Finally, bidirectional communication, remote meter programming, hourly usage data and hourly consumption functionalities were also implemented in June 2015.

III. PROPOSED DEPLOYMENT SCHEDULE

Q. Please summarize the smart meter deployment schedule that has been approved by the Commission.

A. The current smart meter deployment schedule begins with a 5,000 smart meter acceptance roll out in 2014 followed by ramp up to 90,000 meters by year end 2015. The

[2] The FOCUS project is not an issue in this proceeding as the project was implemented in November 2014, and cost recovered in the Company's 2013 distribution rate case at Docket No. R-2013-2372129. Accordingly, my testimony will not address the FOCUS project in any detail.

[3] Duquesne Light uses the term "smart meter" and "advanced meter" interchangeably to refer to the same technology.

Company planned to begin a full scale deployment of 9,500 meters per month in the first quarter of 2016. The Company's approved plan calls for complete deployment of both residential and commercial & industrial smart meters by the end of 2020.

Q. *Is the Company proposing any changes to the meter deployment schedule that has been approved by the Commission?*

A. Yes. The proposed smart meter deployment schedule accelerates the quantity of residential smart meters to 12,500 per month, completing the residential deployments by the end of 2018. Commercial & Industrial smart meter deployment will begin in 2016 installing 7,500 meters per year, completing the commercial & industrial smart meter installations by the end of 2019. The Company will complete full deployment of both Residential and Commercial & Industrial smart meters by the end of 2019.

Q. Why is the Company proposing these changes?

A. Accelerating the smart meter deployment schedule enables the Company to offer the enhanced capabilities and functionalities available from the Company's system to our customers sooner. Under the accelerated meter deployment plan, roughly 84,000 customers will receive a smart meter and the associated benefits of AMI earlier.

Q. Will these changes increase the cost of the Company's smart meter deployment as compared to its currently approved plan?

A. No. Decreasing the full deployment term by one year increases the annual cost for the remaining five years, but the increase is offset by the reduction in cost of the meter

installations, and the management and administration costs of the original sixth year. This offset makes the compression of the deployment timeline cost neutral.

IV. SMART METER FUNCTIONALITY

Q. Is the Company proposing any changes to the timeline that was approved by the Commission for implementing smart meter functionality?

A. Yes. Minimal changes have been made to the timeline for implementation of various functionalities.

Q. Please explain the proposed changes.

A. First, the Company postponed implementation of bidirectional communication and remote meter reprogramming from the fourth quarter of 2014 until 2015. The change was required to address competing regulatory and business information technology ("IT") needs. Additionally, the Company proposes to postpone TOU, RTP and Net metering functionality until 2016. Those functionalities were originally proposed for implementation in 2015.

Q. *Why is the Company proposing these changes?*

A. The timeline changes proposed are designed to align with the Company's broader software deployment schedule. An in depth analysis of the technical requirements of these functionalities indicated that each required an alignment of certain pre-requisites in order to efficiently deploy the functionality. A detailed deployment roadmap was

developed which drove when each functionality was to be effectively deployed, along with the required resources.

Q. Do you believe that these changes are reasonable?

A. Yes. The Company will continue to offer net metering to its customers using the existing AMR system; therefore there is virtually no impact to customers for the schedule change. Likewise, the Company postponed implementation of a TOU program to better align with the availability of smart meters in the Company's service territory and allow greater customer participation. The Commission approved delaying the TOU program in its Order enter July 31, 2015 at docket number P-2015-2484590. I believe that the proposed changes are reasonable and prudent.

V. UPDATED COST ESTIMATES

Q. Has the Company's estimate of the cost for deploying smart meter technology changed since its 2012 smart meter filing?

A. Yes. The updated costs of the AMI project as described in the 2012 Smart Meter Plan are currently estimated at $240 million. In addition, the Company's proposed budget now includes costs to maintain smart meter operations which are an additional $10 million through 2019, plus $7 million to implement Bill Ready - Rate Ready functionality. The costs of meter operations and Bill Ready functionality were not included in the Company's 2012 Smart Meter Plan estimated cost of $203 million.

The Company also proposes to implement enhanced outage communication, restoration and voltage monitoring by implementing an ADMS as described in the direct testimony of Mr. James T. Karcher. The estimated cost of the ADMS implementation is $46-$56 million. Accordingly, the total costs to implement "smart meter technology" including ADMS are estimated at $319 million. As explained in Mr. Karcher's direct testimony, the Company continues to investigate lower cost, lower benefit options for implementing enhanced outage communication, restoration and voltage monitoring functionality.

Q. Why have these cost estimates changed?

A. The primary drivers for the cost increases fall into four areas:

1. Hardware/Software – The original budget assumed that the hardware and software for FOCUS would be sufficient to support the AMI program. Additional servers, operating system licenses and database software were necessary to support additional development and test recovery environments. Finally, Meter Shop software replacement cost was not included in the original amount. This software is used to receive new meters into inventory and then manage the testing and the status of the meters in and out of the company.
2. Accenture - The original budget included estimates for a system integrator prior to the selection of a vendor. Once the vendor, Accenture, was selected following a competitive procurement, their costs were higher than the original estimate.
3. Internal Labor - The DLC labor costs increased from the original budget for the following reasons:

- The original budget only included labor for full time employees that were solely working on the AMI project. The revised budget includes all full-time and part-time labor for time spent by employees working on the program, including those in the original filing.
- A new project management office ("PMO"), with shared service functions was established to manage the complexities of the program and the interrelationship with other IT initiatives and meeting the deadlines established for AMI.

4. Outside Services - A number of third party suppliers are budgeted and in some cases have been utilized to provide a variety of AMI related services. A sampling of those suppliers and services include:
   - OPower was selected to develop a customer presentment platform to provide customers with access to their usage and consumption information.
   - Customer Service Entrance Repairs, which was not included in the 2012 Smart Meter Plan.
   - A third party cyber security firm was hired to conduct a vulnerability assessment and penetration testing of the AMI solution as required by the 2012 Smart Meter Plan Joint Settlement between Duquesne Light and the Office of Consumer Advocate.

Q. Is the Company taking measures to limit smart meter costs to the extent possible?

A. Yes. The Company employed the competitive bid process for all outside vendor contracts, resulting in the lowest cost qualified solution for most aspects of the plan. The Company also formed a new PMO to ensure consistent and cost effective oversight of the

AMI project. Additionally, the Company continually monitors and evaluates each component of the AMI project, including the budget to ensure control is maintained.

Q. Does this conclude your Direct Testimony at this time?

A. Yes.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of Duquesne Light Company for Approval to Modify its Smart Meter Technology Procurement and Installation Plan	:	Docket No. M-2009-2123948 P-2015_____

VERIFICATION

I, Brian J. Novicki, hereby state that the facts set forth in Duquesne Light Company's Amended Smart Meter Technology Procurement and Installation Plan and Duquesne Light Statement No. 1 filed in the above captioned docket on August 4, 2015 are true and correct to the best of my knowledge, information and belief. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

Brian J. Novicki

Date: August 4, 2015

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF DUQUESNE LIGHT COMPANY FOR APPROVAL OF AMENDMENT TO ITS SMART METER TECHNOLOGY PROCUREMENT AND INSTALLATION PLAN

Docket No. M-2009-2123948
P-2015-_____

DIRECT TESTIMONY

Witness: James T. Karcher

Subject: Advanced Distribution Management System Implementation - Outage Communication and Voltage Monitoring

August 4, 2015

Direct Testimony of James Karcher

I. INTRODUCTION

Q. Please state your full name and business address.

A. My name is James T. Karcher. My business address is 2839 New Beaver Avenue, Mail Drop N2-SO, Pittsburgh, PA 15233.

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

A. I am employed by Duquesne Light Company ("Duquesne Light" or "Company") as Manager, Operations Technology Projects.

Q. What are your qualifications, work experience and educational background?

A. I graduated from Penn State University in 1985 with a BS Electrical Engineering. I have 29 years of experience in the Electric Utility Business including: Chambersburg Municipal Electric - 13.5 years as Assistant Electric Superintendent; Allegheny Power – 10.5 years in Distribution and Transmission Planning; and Duquesne Light Company – 4+ years in Transmission Planning and 5 months in Operations Technology Projects.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to provide details supporting the Outage Management System ("OMS") and the Distribution Management System ("DMS") which when compatibly installed form an Advanced Distribution Management System ("ADMS") that is proposed by the Company to satisfy the outage communication and voltage

monitoring capabilities that are set forth in the Pennsylvania Public Utility Commission's ("Commission") Smart Meter Implementation Order ("*Implementation Order*").

II. BACKGROUND

Q. Are you generally familiar with the Commission's *Implementation Order*?

A. Yes. I have reviewed the requirements in the *Implementation Order* related to outage communication and voltage monitoring. As I understand the Order, electric distribution companies ("EDCs"), such as Duquesne Light, were required to implement certain smart meter capabilities above those required by Act 129, if those capabilities were found to be cost-effective. EDCs were also required to provide a cost-benefit analysis for the additional smart meter capabilities.

Q. Did Duquesne Light file a Smart Meter Plan pursuant to the *Implementation Order*?

A. Yes. The Company filed a Petition for Approval of its Smart Meter Plan on June 29, 2012 ("2012 Smart Meter Plan"). As it relates to outage communication and voltage monitoring, the plan provided for minimal incremental enhanced functionality. On May 6, 2013, the Commission issued an Order approving Duquesne Light's 2012 Smart Meter Plan and further directing Duquesne Light to make a compliance filing within ninety (90) days providing data supporting whether or not inclusion of the voltage monitoring and communication of outages and restorations capabilities would be cost effective.

Q. Did Duquesne Light provide the Commission with data supporting whether or not inclusion of the voltage monitoring and outage communication and restoration functionalities would be cost effective?

A. Yes. The Company provided preliminary information in its Compliance filing on August 2, 2013. The Company concluded that implementation of outage communication and voltage monitoring appeared to be cost-effective. Duquesne Light proposed to initially evaluate Volt/VAR optimization, outage notification, and transformer loading capabilities. The Company explained that Voltage/VAR optimization can reduce line loss inefficiencies by optimizing reactive power flow and improving the PF (Power Factor) of the electrical distribution system thereby decreasing the amount of current flow necessary to meet customer load demand. Outage notification using AMI data together with a compatible Outage Management System ("OMS") will provide better diagnostics and control of abnormal conditions during power outages. This would allow power outage restoration to be completed faster than before and would increase reliability of the electrical distribution system. The system also would provide proactive communications with customers affected by a power disruption. Finally, transformer load monitoring capability can minimize outages caused by overloading transformers during peak periods. The Company further explained that, at a minimum, the Company would be required to implement an Outage Management System ("OMS") and an electrical model. The preliminary cost estimate ranged from $22 million - $44 million dollars.

The Company also explained that it expects to develop and execute the potential outage communication, restoration, and voltage monitoring capability plan in three phases. In Phase I, the Company would perform a detailed study of distribution operation

processes and technology, data collection for electric distribution modeling, and issue a more specific scope of work/roadmap which will include more refined cost-benefit analyses. Phase II was expected to focus on advanced outage capabilities. Finally, Phase III was expected to focus on distribution monitoring and control applications.

Q. Has the Company performed any further analysis of outage communication and voltage monitoring capabilities since August 2013?

A. Yes. Using the Duquesne Light supply chain process, a request for proposal ("RFP") was issued to three companies. Two of the companies provided a proposal and one company declined to respond. The two proposals were evaluated and DNV GL was selected. Duquesne Light worked with DNV GL on the "OMS Study" and the results were delivered to Duquesne Light on June 1, 2015.

Q. Based on the results of the studies, has the Company developed a proposal to implement outage communication and voltage monitoring capabilities?

A. Yes. To meet the requirements of the *Implementation Order*, Duquesne Light proposes to first develop and build an electrical model which is expected to be completed 3 years after approval. An electrical model is the foundation of an OMS, a DMS and an ADMS. Next, Duquesne Light proposes to implement OMS to provide enhanced outage communication which is expected to be completed one year after the electrical model has been completed and 4 years after approval. Finally, Duquesne Light proposes to install the DMS portion of the ADMS which is expected to be in service 1.25 years after OMS has been completed and 5.25 years after approval. When installed as part of an ADMS, a

DMS incrementally adds distribution management functionality to an OMS such as Volt/VAR optimization, transformer loading, fault location, and switching solutions.

III. PROPOSED OUTAGE COMMUNICATION AND VOLTAGE MONITORING IMPLEMENTATION

Q. Please summarize the Company's OMS implementation proposal.

A. Moving the Duquesne Light outage process to an OMS is a significant change to the entire distribution operations department of Duquesne Light. For a successful implementation, Duquesne Light must be prepared to implement, use, and maintain an electrical model. An electrical model houses data that makes up an electric distribution system and represents it on a geo-spatially correct digital map. An electrical model can be used for effective distribution planning and is the foundation for mobile mapping applications and systems such as OMS and DMS. The completed OMS will leverage the Duquesne Light's Supervisory Control and Data Acquisition ("SCADA") system, Intelliruptor technology, FOCUS and smart meter technology.

During the first year of the project, Duquesne Light will develop new work processes and implement a change management strategy so Duquesne Light is prepared for the new technology. Duquesne Light will hire a qualified consultant and contract with a system integrator to be utilized during the entire implementation. Additionally, Duquesne Light plans to hire approximately 15 full time employees in engineering, information technology (IT), and operations. Duquesne Light currently uses a state of the art Geographical Information System (GIS) and plans to continue its use for the electrical

model. Duquesne Light will purchase an Electric Modeling tool, which will enhance the GIS, and a Graphical Job Design tool needed to keep the electrical model up to date.

During years 2 and 3, Duquesne Light will build the electrical model including hiring a contractor to conduct a field inventory survey of the electric distribution system. The electrical model is projected to be in operation at the end of year 3. Duquesne Light expects to hire approximately 5 additional FTEs in operations and IT to support the electrical model and to prepare for the OMS next step.

An RFP for the OMS will be developed and a vendor will be selected during year 2 while the field survey is underway. OMS factory acceptance testing will take place during year 3 and site acceptance testing during year 4. The OMS system is projected to go live during the fourth quarter of year 4. Customer outreach programs, such as text messaging services to notify customers of outages and restorations reported by smart meters, will be tested and implemented at the end of year 4 and the beginning of year 5. New reliability reporting benchmarking will be developed using the new OMS using statistics from outages that occur after OMS is live. The use of mobile data units such as laptop computers, tablets, or smart phone devices, for accessing OMS in the field will be implemented in year 5 and their use will mature beyond year 5.

Q. Under the proposal, when is the OMS implementation expected to be complete?

A. The OMS is expected to be in service and usable during the fourth quarter of 2019. New reliability benchmarking will be set over the next several months of recorded outages. The Company expects to establish new reliability approximately 12 months after the OMS is in service.

Q. Please describe the benefits that the Company expects to achieve from the OMS implementation.

A. Using OMS with smart meter information is expected to produce savings of up to $300,000 per year for the Company once fully implemented. The savings will be as a result a reduced number of phone calls taken at the call center due to customer outreach notifications of smart meter reporting of outages and restorations and increased efficiencies during and after storm events.

Additionally, using OMS is anticipated to reduce the average duration of power outages because operators will have quicker awareness of the number of customers affected by an outage and will be able to dispatch crews earlier to the larger outages. Reduced outage time results in reduced customer impacts. A savings of five (5) minutes in customer average duration time for Duquesne Light customer is anticipated to be achieved with OMS using smart meter data. This reduced customer impact reflects an estimated avoided consumer cost of an outage at a value of approximately $6,000,000 per year to Duquesne Light's customers. It should be noted that some electric utilities experienced an initial increase in outage duration because of unfamiliarity of the newly installed OMS.

Duquesne Light operations will see increased safety awareness with OMS especially when it is integrated with the Automatic Vehicle Location ("AVL") system. The Duquesne Light operations center will be able to view the location of each Duquesne Light vehicle on an OMS map that also shows outage locations and can make each crew aware and prepared for energization of nearby facilities. The crews that are closest to potential public hazards will be known and can be dispatched for quicker arrival time.

There are numerous "soft" benefits that are not quantifiable which include increased customer satisfaction, increased safety to the public and Duquesne Light employees, and enhanced operations in various Duquesne Light departments.

Duquesne Light will be able to dispatch crews to wire down calls more quickly with OMS integrated with AVL software decreasing public exposure to dangerous voltages. The operations center will have a greater awareness of crew location increasing crew safety when re-energizing lines.

Customer satisfaction during storm events is expected to improve because, using real time smart meter outage data, Duquesne Light will generally be aware of customer outages before a customer calls. Through AMI, Duquesne Light will be able to ping the smart meters for restoration confirmation and proactively send a message to the customer notifying the customer of restoration and eliminating the need for restoration confirmation call backs. Estimated times of restoration ("ETR") will improve with an OMS and can be communicated to the customer at the beginning of an outage and when updated.

The number of customers affected by an outage will be derived from how they are connected to the electric distribution system in the electrical model instead of being based on the amount of KVA that is affected by the outage.

Many Duquesne Light departments will see improved and enhanced operations. The following additional benefits will be seen by the Operations Center: Operators can manage outages from one application opposed to several applications that are being used today. The operators will be able to model outages at switching points and non-switching

points by using line cuts and jumpers. The amount of paper used to manage outages will be reduced as we move away from printed tickets.

Additional benefits will be seen by the Field personnel. For example, there will be a reduction in incidences of being dispatched to locations where outages have already been restored. Field workers, through the use of mobile data units, will be able to update OMS with ETRs, arrival times, trouble cause, describe any follow up work, etc.

During damage assessment, information will be able to be captured in OMS directly from the field to ensure that the repairing crews bring proper materials and equipment upon first arrival.

Additionally, reliability reports can be automatically generated requiring much less manual intervention during outage reporting.

In the call center, the customer service representatives ("CSR") will have access to an OMS dashboard which provides outage details to provide to customers. Historical outage information for a calling customer will be accessible. The number of calls a CSR takes will be reduced due to automatic messaging.

Information on outages will be more readily available to the Media and Community Relations department using the OMS dashboard to give timely responses to media requests such as ETRs or whether crews have arrived on the scene. An enhanced outage map with outage counts and customer outage counts based on the electrical model will provide timely data needed to report to requesting news agencies, local governments and the Commission.

Q. Please describe the methodology used to arrive at the monetary value of the benefits described.

A. The reduction of calls taken at the call center is expected to translate into enough time savings to reduce two (2) full time employees at the call center through attrition.

The storm plan will change as a result of using OMS with smart meter inputs. Duquesne Light will see some reduction in overtime while supporting a storm due to eliminating personnel that call customers back after restoration and personnel who count the number of customers out of power. Additional savings will occur when assembling reliability reports after a storm that will be generated more easily with OMS. Extremely large storms, which affect Duquesne Light about every 3-5 years, would see a reduction of overall restoration time and a reduced number of truck rolls due to smart meter reporting.

Societal Benefits are savings to the customer as a result of outage avoidance. Customer interruption costs are costs of customer damages resulting from power interruptions. Customers experience costs that are directly related to outage durations. A short outage, or momentary outage, can have a significant effect on industrial and office customers but will likely have a minimal effect on residential customers. As an outage increases in duration, the resulting costs increase. Lost production time and food spoilage are two examples of increased costs. In addition to the financial impacts, the lack of power creates conditions that could cause injury. DNV GL calculated expected societal benefits based on reduced outage duration time on the Duquesne Light circuits using industry accepted parameters as they apply to the Duquesne Light customer base.

Q. What is the expected cost of the OMS implementation?

A. Presently, the OMS implementation, which includes surveying the distribution system and building an electrical model, is expected to cost $42.2-$51.6 million. The Company is evaluating alternative methods for implementing OMS which may reduce the costs and functionality available from the system.

Q. How were the costs estimate derived?

A. The cost estimates were developed during the study performed by DNV GL. Estimates include Duquesne Light labor, outside consultants, outside contractors, hardware and software purchase, installation, integration, and implementation. DNV GL provided input for the estimate to Duquesne Light through using their knowledge and experience in the ADMS and electrical modeling field, referring to costs of installation of other utilities, and by receiving budgetary quotes from various vendors that supply the various products to build an ADMS. Based on this input, Duquesne Light developed a cost estimate. The cost estimates are given in a range because of the uncertainty surrounding the cost associated with a project at this stage of development. More accurate pricing cannot be achieved until the various components of the ADMS are bid out under a competitive procurement process.

Q. Do you believe that the proposed OMS implementation is cost-effective and reasonable?

A. Yes. The societal, or customer, benefits due to increased reliability using Duquesne Light OMS are estimated to reach $6 million per year resulting in a societal payback period of

7-9 years. OMS implementation will provide technology to Duquesne Light that will enhance planning, operations and engineering. Duquesne Light is expected to realize a savings benefit of up to $300,000 per year for the Company once the OMS is fully implemented.

IV. PROPOSED DMS IMPLEMENTATION

Q. *Is the Company proposing to implement any additional capabilities related to outage communication and voltage monitoring?*

A. Yes. As part of the voltage monitoring capabilities associated with the AMI upgrade, Duquesne Light selected to evaluate Volt/VAR optimization and transformer loading. A Distribution Management System ("DMS") is needed to provide these voltage monitoring functions. A DMS performs distribution management functionality such as Volt/VAR optimization, transformer loading, fault location, and switching solutions. Use of real time voltage data from smart meters will enable a DMS to keep make real time adjustments to keep customer voltages in proper range. Duquesne Light chose to pursue implementing an Advanced Distribution Management System ("ADMS") which is combination of OMS and DMS (ADMS=OMS+DMS). The distribution management portion of the ADMS will be installed after the OMS is usable.

Q. Under the proposal, when is the DMS implementation expected to be complete?

A. The DMS is expected to be placed in service at the end of year 5, however some installation costs are expected to occur in the first quarter of year 6 as necessary adjustments on this complicated tool are anticipated after the in service date.

Q. Please describe the benefits that the Company expects to achieve from the DMS implementation.

A. Volt/VAR optimization and transformer loading were evaluated and shown to have system benefits. The Volt/VAR optimization using real time smart meter data is expected to achieve an electric system benefit of $2 million per year in capacity demand reduction once the DMS fully implemented and utilized. The capacity demand reduction will be passed on to customers through reduced power costs but will not be received directly by Duquesne Light.

The transformer loading analysis using smart meter real time usage data is expected to achieve a benefit of $285,000 per year due to Asset Management savings and overtime savings once the DMS fully implemented and utilized.

The DMS will provide enhanced fault location. With a detailed electrical model and the use of existing fault current monitoring devices, the DMS will be able to pinpoint faults as they occur. This will reduce the time needed to find damage to the distribution system where the trouble location is unknown otherwise.

Q. Please describe the methodology used to arrive at the monetary value of the benefits from the DMS.

A. Volt/VAR optimization - A DMS will allow Duquesne Light to reduce the capacity demand on the electric system by reducing power as a function of voltage reduction. This is accomplished by reducing voltage via substation or distribution load tap changers through power transformers, voltage regulators, and switched capacitors on distribution circuits. Used in conjunction with real time smart meter data, Duquesne Light will be

able to better maintain customer voltage within limits while accomplishing capacity demand reduction. Smart meters reporting voltage issues will trigger the DMS to recommend/perform system adjustments for reliability and efficiency. Technical losses on the Duquesne Light network will be reduced by using the DMS. Once the DMS is implemented, these DMS benefits can be realized through system adjustments as opposed to capital upgrades. The estimated cost savings were calculated by DNV GL as part of the "OMS study".

Transformer Loading – The DMS utilizes the correlation of customer to transformer that will be developed with the electrical model, and provides the ability to forecast loading on the distribution network which will enable Duquesne Light to proactively take steps to remedy transformer loading issues before they appear. Transformers approaching overload could be replaced or relieved by adding additional transformers prior to failure during straight time saving overtime. Identifying and relieving transformer overloads proactively could extend the asset life of the potentially overloaded transformers by an average of 5 years. The estimated cost savings were calculated by DNV GL as part of the "OMS study".

Q. What is the expected incremental cost of the DMS implementation?

A. The incremental cost of installing the DMS after the OMS is in service is $3.8-$4.4 million.

Q. How were the costs estimate derived?

A. The cost estimates were developed during the study performed by DNV GL. Estimates include Duquesne Light labor that is incremental to labor costs included in base rates, outside consultants, outside contractors, hardware and software purchase, installation, integration, and implementation. DNV GL provided input for the estimate to Duquesne Light through using their knowledge and experience in the ADMS and electric modeling field, referring to costs of installation of other utilities, and by receiving budgetary quotes from various vendors that supply the various products to build an ADMS. Based on this input, Duquesne Light developed a cost estimate. The cost estimates are given in a range because of the uncertainty surrounding the cost associated with a project at this stage of development. More accurate pricing cannot be achieved until the various components of the ADMS are bid out under a competitive procurement process.

Q. Do you believe that the proposed DMS implementation is cost-effective and reasonable?

A. Yes. Total electrical system benefits are estimated to reach approximately $2.285 million per year, of which Duquesne Light is estimated to realize $0.285 million per year, resulting in a less than 2 year payback of the incremental DMS cost.

Q. What is the expected cost of the complete ADMS implementation?

A. The total implementation, which includes the costs of the OMS and the DMS, is expected to cost $46-$56 million. Ongoing operating costs, including software support and Duquesne Light labor needed to operate and support the portions of the project that were

placed in service through the duration of the project, amount to an additional $5-$6 million.

Q. Do you believe that the proposed overall ADMS implementation is cost-effective and reasonable?

A. Yes. The total benefit of the ADMS system over 20 years is $46.3 million including Volt/VAR optimization, transformer loading, and OMS benefits but excluding customer benefits. Additionally, the societal, or customer, benefits due to increased reliability using Duquesne Light OMS portion of the ADMS are estimated to reach $6 million per year.

Q. Is the Company considering any additional options to implement the outage communication and voltage monitoring?

A. While Duquesne Light believes that the proposal discussed herein is reasonable, the Company continues to evaluate lesser cost options to achieve enhanced outage communication, restoration and voltage monitoring functionality. Some options may have less functionality but will also be less expensive. One example may include a reduced electrical model capable of supporting an OMS but not a DMS. In this example, the cost of the OMS would be reduced but the incremental cost to implement a DMS may increase. Any alternative chosen to complete OMS will leverage Duquesne Light's Supervisory Control and Data Acquisition ("SCADA") system, Intelliruptor technology, FOCUS, and smart meter technology.

Q. Does this conclude your Direct Testimony at this time?

A. Yes.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of Duquesne Light Company for Approval to Modify its Smart Meter Technology Procurement and Installation Plan	:	Docket No. M-2009-2123948 P-2015-_____

VERIFICATION

I, James T. Karcher, hereby state that the facts set forth in Duquesne Light Statement No. 2 filed in the above captioned docket on August 4, 2015 are true and correct to the best of my knowledge, information and belief. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

James T. Karcher

Date: August 4, 2015

Duquesne Light Statement No. 3

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

PETITION OF DUQUESNE LIGHT COMPANY FOR APPROVAL TO MODIFY ITS SMART METER PROCUREMENT AND INSTALLATION PLAN

Docket No. M-2009-2123948
P-2015-_____

DIRECT TESTIMONY

Witness: William V. Pfrommer

Subject: Smart Meter Cost Recovery

August 4, 2015

Direct Testimony of William V. Pfrommer

I. INTRODUCTION

Q. Please state your full name and business address.

A. My name is William V. Pfrommer. My business address is 411 7th Avenue, Pittsburgh, PA 15219.

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

A. I am Senior Manager, Rates & Tariff Services, for Duquesne Light Company ("Duquesne Light" or "Company").

Q. What are your qualifications, work experience and educational background?

A. I received a Bachelor of Science Degree in Mechanical Engineering from Grove City College in 1978 and a Masters Degree in Business Administration from the University of Pittsburgh in 1989. I began my career at the Company in 1982 as a Project Engineer in the Engineering and Construction Division at the Beaver Valley Power Station. Over the last 33 years, I have held staff, supervisory and managerial positions in engineering, nuclear construction, customer technical services, marketing and rates. In my current role as Senior Manager of Rates and Tariff Services, I am responsible for overseeing the Company's retail rates and wholesale transmission rates. In addition, it is my responsibility to ensure the rates are properly applied to customer bills.

Q. Have you previously testified before the Pennsylvania Public Utility Commission ("Commission") or other regulatory bodies?

A. Yes. I have testified on rate design matters before the Pennsylvania Public Utility Commission ("Commission") and Federal Energy Regulatory Commission ("FERC"). A list of proceedings in which I have submitted testimony is provided in Appendix A. Of note, I testified in the Company's Initial Smart Meter Filing proceeding at Docket No. M-2009-2123948 submitted August 14, 2009 and in the Company's Final Smart Meter Procurement and Installation Plan ("2012 Smart Meter Plan") Filing submitted June 29, 2012.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to first provide an overview of the Company's Smart Meter Cost Recovery Mechanism or Smart Meter Charge ("SMC"). Second, I will briefly summarize the level of costs that Duquesne Light anticipates it will recover through the SMC to implement its Amended Smart Meter Deployment Plan ("Amended Smart Meter Plan").

II. COST RECOVERY MECHANISM

Q. **Does Act 129 provide guidance on how the costs of providing smart meter technology are to be recovered by the Company?**

A. Yes. Act 129 of 2008 ("Act") permits electric distribution companies ("EDCs") to fully recover the costs of providing smart meter technology, less operating and capital cost savings realized by the EDC. The Act permits EDCs to recover its

allowable costs via a reconcilable surcharge consistent with 66 Pa. C.S. § 1307 ("Section 1307"), or in its base rates.

Q. Which cost recovery method was implemented by Duquesne Light?

A. Pursuant to the Implementation Order, *Smart Meter Procurement and Installation Implementation Order*, Docket No. M-2009-2092655 ("*Implementation Order*"), entered by the Commission June 24, 2009, Duquesne Light petitioned the Commission for approval of its Initial Smart Meter Technology Procurement and Installation Plan ("Initial Smart Meter Plan") on August 14, 2009. In its Initial Smart Meter Plan the Company proposed to recover its costs to implement smart meter technology via a Section 1307 SMC. By order dated May 11, 2010, the Commission approved Duquesne Light's Initial Smart Meter Plan with certain modifications. In addition, the Commission approved the Company's SMC, with certain modifications, which provides for full and current cost recovery of smart meter costs. The first SMC was implemented effective August 1, 2010.

In its 2012 Smart Meter Plan, the Company proposed to continue the SMC without change. This was approved by the Commission in its order entered May 6, 2013.[1]

[1] Subsequent to the Smart Meter Deployment Plan order, the regional Commission auditors identified an erroneous reference in the SMC to the interest rate for over and under collections. On November 12, 2014 at Docket Nos. R-2014-2452820 and M-2009-2123948, the Company filed a change to the SMC which was approved by the Commission by secretarial letter dated November 21, 2014. This change was administrative in nature because the Company had been calculating interest on over and under collections at the correct interest rate stated in the Commission's May 22, 2010 order.

Q. Please describe the SMC as approved by the Commission.

A. The SMC recovers all eligible costs incurred by the Company to implement smart meter technology and the supporting Advanced Metering Infrastructure ("AMI"). The Company also proposes to recover costs to implement the Voltage Monitoring and Communication of Outages and Restorations System ("Outage Management System" or "OMS") through the SMC. The SMC is updated quarterly, effective January 1, April 1, July 1 and October 1 each year. Ten days prior to the beginning of each quarter, the Company submits a calculation of the monthly smart meter charge effective for the upcoming quarter. The fixed monthly charge is billed based on the type of meter installed at the customer premise.

Q. How does the Company assign and recover costs under the SMC?

A. The Company assigns cost based on three primary components of the Smart Meter Plan: a) single-phase meters, b) three-phase meters and c) common costs. The SMC uses a formula to calculate the revenue requirement for the quarter for each component. The revenue requirement associated with the common cost component is allocated to the revenue requirement for each meter type based on the quantity of each type of meter. Common costs in general include infrastructure costs for hardware and software for meter data management, data storage and collection systems, networks and communication systems and OMS costs. An SMC is then derived for each meter type based on the revenue

requirement for each meter type including allocated common costs and the projected quantity of meters for the upcoming quarter.

A description of the SMC is provided in Rider No. 20, Smart Meter Charge, of the Company's retail tariff.

Q. What depreciation rates does the Company apply under its SMC?

A. The Company applies a depreciable life of 15 years for smart meters to align with the 15 year depreciation period defined in the Act. The Company applies a depreciable life of 10 years for capital investment in common costs.

Q. Does the Company propose to recover the costs for implementing its Amended Plan in this proceeding through its existing SMC?

A. Yes.

Q. Is the Company proposing to make any modifications to the SMC in this proceeding?

A. No.

III. PROJECT COSTS

Q. Has Duquesne Light identified all of the estimated costs for its Amended Plan that it seeks to recover?

A. Yes. The projected costs for all of the components of the Amended Plan are detailed in the direct testimony and exhibits of Duquesne Witnesses Brian

Novicki and James Karcher. Duquesne Light projects that the total cost of implementing the Company's Amended Smart Meter Plan will be approximately $319 million, including ADMS.

As explained by Mr. Novicki and Mr. Karcher, the Company estimates that it will incur these costs to implement its Amended Plan including the scope associated with implementing the OMS system and the Bill Ready/Rate Ready functionality. The Company seeks Commission approval to recover these expenditures that are necessary to fully implement the Company's Amended Plan through its existing SMC.

Q. Is the Company proposing to recover costs associated with implementing its new customer billing system through the SMC in this Amended Plan filing?

A. No. At the time of the 2012 Smart Meter Plan filing, the Company included costs for its new customer care and billing system ("FOCUS") in its filing and proposed to recover those costs through the SMC. In July 2013, the Company filed a base distribution rate case at Docket No. R-2013-2372129. In that base rate case, the Company included all costs to implement its FOCUS billing system. Since those costs are now being recovered through base rates, the Company is not proposing to recover any FOCUS related costs through its SMC.

Q. How long does the Company propose to keep the SMC in effect?

A. In its 2012 Smart Meter Plan, the Company proposed to keep the SMC in effect until the first base distribution rate case after the final smart meter was installed and fully functional. In that base rate case, the Company proposed to eliminate

the SMC, prepare a final reconciliation of SMC revenue and revenue requirement for the final reconciliation period, roll PIS, accumulated depreciation, accumulated deferred income taxes and depreciation expense from the SMC at that time into base rates, and address recovery of stranded costs, if any, associated with the existing automated meter reading ("AMR") system in base rates.

In the Amended Plan in this proceeding, Mr. Novicki estimates that the final smart meter will complete by year end 2019 and Mr. Karcher estimates that the ADMS system will be fully functional the first quarter of 2021. The Company does not know when its base distribution rate case will be filed relative to completion of smart meter deployment and OMS completion. The Company still plans to roll recovery of all plant and operating costs into base rates in the first base rate case following completion of the Amended Plan. However, due to timing differences in the completion of each scope of work for smart meters and OMS, it may be more appropriate to phase-out the SMC until the Amended Plan is complete by rolling in applicable plant and operating expense into base rates aligned with completion of project milestones and base rate cases. For example, should timing of a base distribution rate case align with the completion of smart meter deployment, the Company would propose to roll-in to base rates recovery of all plant and operating expenses associated with smart meters and keep the SMC in effect to recover all or a part of the OMS system costs that remain until project completion. In the subsequent rate case, the Company would propose to completely eliminate the SMC and roll-in to base rates recovery of all plant and operating expenses associated with the OMS. The Company therefore proposes

to terminate the SMC in a manner that best aligns with completion of the Amended Plan milestones and timing of base distribution rate cases.

Q. Does that conclude your Direct Testimony?

A. Yes.

Appendix A

William V. Pfrommer
Rate and Regulatory Proceedings

Pennsylvania Public Utility Commission:

Docket No. P-2014-2418242 – Default Service Program and Procurement Plan for the Period June 1, 2015 through May 31, 2017
Docket No. R-2013-2372129 – Distribution Base Rate Case
Docket No. M-2013-2350946 – Petition for Approval and Modification of Company's 2014-2016 Universal Service and Energy Conservation Plan
Docket No. M-2012-2334399 - Energy Efficiency and Conservation Phase II Plan
Docket No. P-2012-2301664 – Default Service Program and Procurement Plan for the Period June 1, 2013 through May 31, 2015
Docket No. R-2010-2179522 – Distribution Base Rate Case
Docket No. P-2009-2135500 - Provider of Last Resort (POLR V)
Docket No. M-2009-2093217 - Act 129 Energy Efficiency and Conservation and Demand Response Plan
Docket No. M-2009-2123948 - Act 129 Smart Meter Procurement and Installation Plan
Docket No. P-2008-2079461 – Special Permission to File a Tariff Supplement on Less than 60 Days Notice (POLR IV)
Docket No. P-00072247 - Provider of Last Resort (POLR IV)
Docket No. R-00061346 – Distribution Base Rate Case
Docket No. P-00032071 - Provider of Last Resort (POLR III)

Federal Energy Regulatory Commission:

Docket No. ER14-1258-000 – Depreciation Rate Update Filing
Docket No. ER13-1220-000 – Monthly Deferred Tax Adjustment Charge
Docket No. ER08-1309-000 – Changes to the MISO Open Access Transmission Tariff to integrate the Company into the Midwest Independent System Operator, Inc.
Docket No. ER05-85-000 – Changes to the PJM Open Access Transmission Tariff to integrate the Company into the PJM Interconnection, L.L.C.

Other:

Cause No. 42416, Filed April 14, 2003, Indiana Utility Regulatory Commission – Petition of Utility Center, Inc., d/b/a AquaSource
Cause No. 41968, Filed March 30, 2001, Indiana Utility Regulatory Commission – In the Matter of Utility Center, Inc., d/b/a AquaSource
Docket Nos. 2000-1074-UCR and 2000-1075-UCR, Filed June 15, 2000 – Texas Natural Resource Conservation Commission, Applications of AquaSource Utility, Inc. to Change its Water and Sewer Tariffs and Rates

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Petition of Duquesne Light Company for Approval to Modify its Smart Meter Technology Procurement and Installation Plan	:	Docket No. M-2009-2123948 P-2015-_____

VERIFICATION

I, William V. Pfrommer, hereby state that the facts set forth in Duquesne Light Statement No. 3 filed at the above captioned docket on August 4, 2015 are true and correct to the best of my knowledge, information and belief. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

William V. Pfrommer

Date: August 4, 2015

CERTIFICATE OF SERVICE

I hereby certify that true and correct copies of the foregoing have been served upon the following persons, in the manner indicated, in accordance with the requirements of 52 Pa. § 1.54 (relating to service by a participant).

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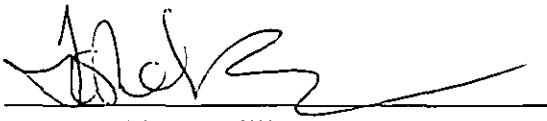

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Date: August 4, 2015

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