

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainants,

v.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

APPENDIX TO BRIEF IN SUPPORT OF MOTION FOR SUMMARY JUDGEMENT

TAB	DESCRIPTION
1	Prehearing Order Dated December 15, 2017
2	Duquesne Light Company Final Smart Meter Technology Procurement and Installation Plan
3	Opinion and Order Dated May 6, 2013
4	Respondent's Responses to Set #1 Discovery Requests
5	Formal Complaint
6	Answer and New Matter to Formal Complaint
7	Respondent's Third Supplemental Responses to Set #1 of Discovery Requests
8	Affidavit of Benjamin Cotts, PhD., P.E. in Support of Motion for Summary Judgment
9	Response to Respondent's First Set of Discovery Requests Directed to Complainants
10	Response to Respondent's Second Set of Discovery Requests Directed to Complainants
11	Letter from Dr. David O. Carpenter Dated October 22, 2017
12	Confidential Medical/Health Documents in Response to Respondent's Discovery Requests Directed to Complainants
13	Opinion and Order dated April 7, 2017

LIT:641312-1 014657-158498

Appendix Tab 1

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Michele Hriadil and
Francis Hriadil

v.

Duquesne Light Company

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:

C-2016-2571726

PREHEARING ORDER

Upon concluding a prehearing conference with Jeremy V. Farrell, Esquire and Paul Shane Miller, Esquire appearing for Respondent and Francis Hriadil participating, and after notice was provided to Michele Hriadil who did not participate, an in-person hearing in this case is scheduled for Thursday, April 26 and Friday, April 27, 2018, at 10:00 a.m. in an available hearing room, Piatt Place, 2nd Floor, Suite 220, 301 Fifth Avenue, Pittsburgh, PA 15222.

You must be available in the hearing room when your case is called by the presiding Administrative Law Judge. If the customer is not present and prepared to go forward with the case when it is called, the case will be dismissed.

The parties are hereby directed to comply with the following requirements:

1. That all parties must comply with the following deadlines:

a. Any additional discovery requests shall be served not later than **January 2, 2018**. Responses shall be served within twenty (20) days, pursuant to the applicable regulations.

b. **ON OR BEFORE February 2, 2018**, any Complainant wishing to present expert testimony (including but not limited to medical, technical, etc.) must provide to

the other party in writing, the name and business address of that expert and a written summary of the expected testimony of that expert.

c. **ON OR BEFORE February 2, 2018**, any Complainant wishing to present factual testimony of any person other than Complainants must provide to the other party in writing, the name and business address of that person and a written summary of the expected testimony of that person.

d. **ON OR BEFORE February 15, 2018**, Respondent, wishing to present expert testimony (including but not limited to medical, technical, etc.) must provide to the other party in writing, the name and business address of that expert and a written summary of the expected testimony of that expert.

e. **ON OR BEFORE February 22, 2018**, any party wishing to present rebuttal factual testimony of any person other than Complainants must provide to the other party in writing, the name and business address of that person and a written summary of the expected testimony of that person.

f. **ON OR BEFORE February 22, 2018**, Respondent, wishing to present rebuttal expert testimony (including but not limited to medical, technical, etc.) must provide to the other party in writing, the name and business address of that expert and a written summary of the expected testimony of that expert.

g. Any dispositive motions must be filed **by March 1, 2018**. Any responses to any dispositive motion must be filed no later than seven (7) days after service of that motion.

h. **ON OR BEFORE April 9, 2018**, Complainants and Counsel for Pennsylvania Electric Company are directed to provide one another with copies of all exhibits and statements which the parties intend to present at the hearing.

i. Any stipulations should be submitted to the undersigned, in writing, no later than **noon on April 16, 2018.**

j. *Pro se* Complainants should be served by hard copy unless otherwise agreed to between the parties.

2. **THAT YOU MUST SERVE THE ADMINISTRATIVE LAW JUDGE DIRECTLY WITH ANY DOCUMENTS THAT YOU FILE IN THIS PROCEEDING. IF YOU SEND ANY DOCUMENT OR CORRESPONDENCE, YOU MUST SEND A COPY TO ALL OTHER PARTIES IN THE CASE. THE CURRENT SERVICE LIST IS ATTACHED TO THIS ORDER.**

3. That a request for a change of the scheduled hearing date must state the agreement or opposition of other parties, and must be submitted in writing no later than five (5) business days prior to the hearing. 52 Pa. Code §1.15(b). Requests for changes of hearing dates must be sent to the Administrative Law Judge and all parties of record. My address is:

Pennsylvania Public Utility Commission
Office of Administrative Law Judge
Piatt Place, Suite 220
301 Fifth Avenue
Pittsburgh, PA 15222
Telephone: (412) 565-3550
Fax: (412) 565-5692

Changes are granted only in rare situations where good cause exists.

4. If you intend to present any documents or exhibits for consideration, you must bring at least five (5) copies to the hearing. These are the original and one copy for the Commission's records, one copy for the Administrative Law Judge and one copy for every other party. Proposed exhibits should be properly pre-marked for identification.

5. This hearing is a formal proceeding and will be conducted in accordance with the Commission's Rules of Practice and Procedure.

6. Pursuant to 52 Pa. Code §§1.21 & 1.22, you may represent yourself, if you are an individual, or you may have an attorney licensed to practice law in the Commonwealth of Pennsylvania, or admitted *Pro Hac Vice*, represent you. However, if you are a partnership, limited liability company, corporation, trust, association, or governmental agency or subdivision, you must have an attorney licensed to practice law in the Commonwealth of Pennsylvania, or admitted *Pro Hac Vice*, represent you in this proceeding. Unless you are an attorney, you may not represent someone else. Attorneys shall insure that their appearance is entered in accordance with the provisions of 52 Pa. Code §1.24(b).

7. If you intend to subpoena witnesses for the hearing, you should review the procedures established in 52 Pa. Code §5.421. You must submit your written application to the Administrative Law Judge sufficiently in advance of the hearing date so that the other parties will have the required ten (10) days' notice to answer or object, and so that you will have enough time to receive the subpoena and serve it.

8. **If you, or anyone you plan to call as a witness on your behalf, have a limited ability to speak or understand English or are deaf or hearing-impaired, a qualified interpreter can be provided upon your request. If you want an interpreter, please contact the Scheduling Office at least twenty (20) days before the scheduled Hearing to make your request.** Scheduling Office: (717) 787-1399. AT&T Relay Service number for persons who are deaf or hearing-impaired: 1-800-654-5988.

9. Complainants are responsible for payment of current undisputed bills for service pending the resolution of this complaint. 52 Pa. Code §56.181. Failure to make payments may result in the termination of utility service.

10. **IF ANY MOTIONS ARE PENDING, THE PARTY FILING THE MOTION MUST PROVIDE A COPY OF THAT MOTION TO THE ADMINISTRATIVE LAW JUDGE WITHIN 7 (SEVEN) DAYS OF RECEIPT OF THIS ORDER.**

11. **THE COMPLAINT WILL BE DISMISSED IF THE CUSTOMER FAILS TO PARTICIPATE IN THE HEARING AND PRESENT ADMISSIBLE EVIDENCE IN SUPPORT OF THE COMPLAINT.**

12. Complainants bear the burden of proof and must demonstrate by a preponderance of the evidence that Respondent violated its tariff, the Public Utility Code or a Commission order or regulation, and that they are entitled to the relief requested in the Complaint.

Date: December 15, 2017

Jeffrey A. Watson
Administrative Law Judge

C-2016-2571726 - MICHELE HRIADIL & FRANCIS HRIADIL v. DUQUESNE LIGHT
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Appendix Tab 2

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

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

**Docket Nos. P-2012-_____
M-2009-2123948**

Date: June 29, 2012

Duquesne Light Company – Final Smart Meter Plan

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Duquesne Light Company – Final Smart Meter Plan

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 are 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 (“Final Smart Meter Plan” or “Plan”). This date was subsequently extended to June 30, 2012 upon the request of the Company.

This filing constitutes Duquesne Light’s Final Smart Meter Plan. Below, Duquesne Light has:

- (1) Explained the steps that it has taken to develop this Plan during the Grace Period;
- (2) Provided an overview of the FOCUS Project;
- (3) Explained the Company’s Advanced Metering Infrastructure (“AMI”) Project which includes smart meters, the Local Area Network (“LAN”), the Wide Area Network (“WAN”) and the Head End Collection Engine;
- (4) Explained its plans for IT systems;
- (5) Described the AMI system capabilities;
- (6) Explained its proposed deployment schedule;
- (7) Summarized the Smart Meter Program costs and cost recovery mechanism;
- (8) Explained the Company’s Customer Education and Acceptance Strategy; and
- (9) Explained the Company’s Risk Mitigation Strategies.

Duquesne Light Company – Final Smart Meter Plan

As explained herein, Duquesne Light's Final Smart Meter Plan will 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*").

Under Duquesne Light's Final Smart Meter Plan, Duquesne Light proposes to install Itron Smart Meters for all customers. The Itron Smart Meters will be connected by a Local Area Network ("LAN") that collects data from the meters and transmits it through a Wide Area Network ("WAN") to a Head End Data Collection Engine. These four components will constitute Duquesne Light's Advanced Metering Infrastructure ("AMI") system. As explained herein, Duquesne Light's AMI system will provide a technology architecture that enables the six minimum capabilities of Act 129 and the nine additional capabilities identified by the Commission in its Smart Meter Implementation Order.

Duquesne Light proposes to deploy Smart Meters to customers over a seven-year period. This includes a two-year ramp up period to allow time for the Company to test its AMI system, followed by a deployment schedule of 9,000 meters per month, with full deployment of smart meters across the Company's service territory by 2020, three years ahead of the statutory time period under Act 129. In addition, Duquesne Light proposes to phase-in meter functionalities from 2013-2017. The phase-in approach will allow the market for many of the advanced smart meter capabilities to become more mature over time.

Duquesne Light estimates that the total cost of its Smart Meter Program will be approximately \$238 million. This includes costs for both the FOCUS and AMI projects within the Smart Meter Program. In its Initial Smart Meter Filing, Duquesne Light estimated that its Smart Meter Program could cost between \$152 million and \$262 million to implement. Duquesne Light's current estimate of its Smart Meter Program cost is within the range originally identified by the Company and is \$24 million lower than the high end of its original estimate.

In the Company's Initial Smart Meter filing, the Commission approved, with certain modifications, Duquesne Light's request to recover its smart meter costs through a fully

Duquesne Light Company – Final Smart Meter Plan

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.

In addition, Duquesne Light is proposing a detailed, comprehensive Customer Education and Acceptance (“CEA”) strategy to educate customers, stakeholder groups and employees about the Company’s Smart Meter Program and its benefits. Duquesne Light is basing its CEA strategy on successful programs used by other utilities across the country. Duquesne Light believes that its CEA strategy is a vital component of its Final Smart Meter Plan.

As with all large, multi-year, multi-million dollar technology projects, the Company recognizes the multitude of risks inherent in a Smart Meter Program of this magnitude. Therefore, Duquesne Light has developed a broad set of risk mitigation strategies to minimize any potential negative impact of these risks on the program.

Duquesne Light Company – Final Smart Meter Plan

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).

Duquesne Light Company – Final Smart Meter Plan

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") for EDCs to assess needs, select technology, secure vendors, train personnel, install and test support equipment and establish a detailed meter deployment schedule.

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.

Duquesne Light Company – Final Smart Meter Plan

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

Duquesne Light Company – Final Smart Meter Plan

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. 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.

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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 wireless 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 made an additional milestone filing related to the design, testing and certification of Electronic Data Interchange ("EDI") transactions. Therein, Duquesne Light explained that it would be able to provide customers with direct access to non-validated real time data directly from the smart meter through a residential customer's Home Area Network (HAN).

Duquesne Light Company – Final Smart Meter Plan

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 Light's 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 Light's smart meters to the MDM systems. Finally, the Company would 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.

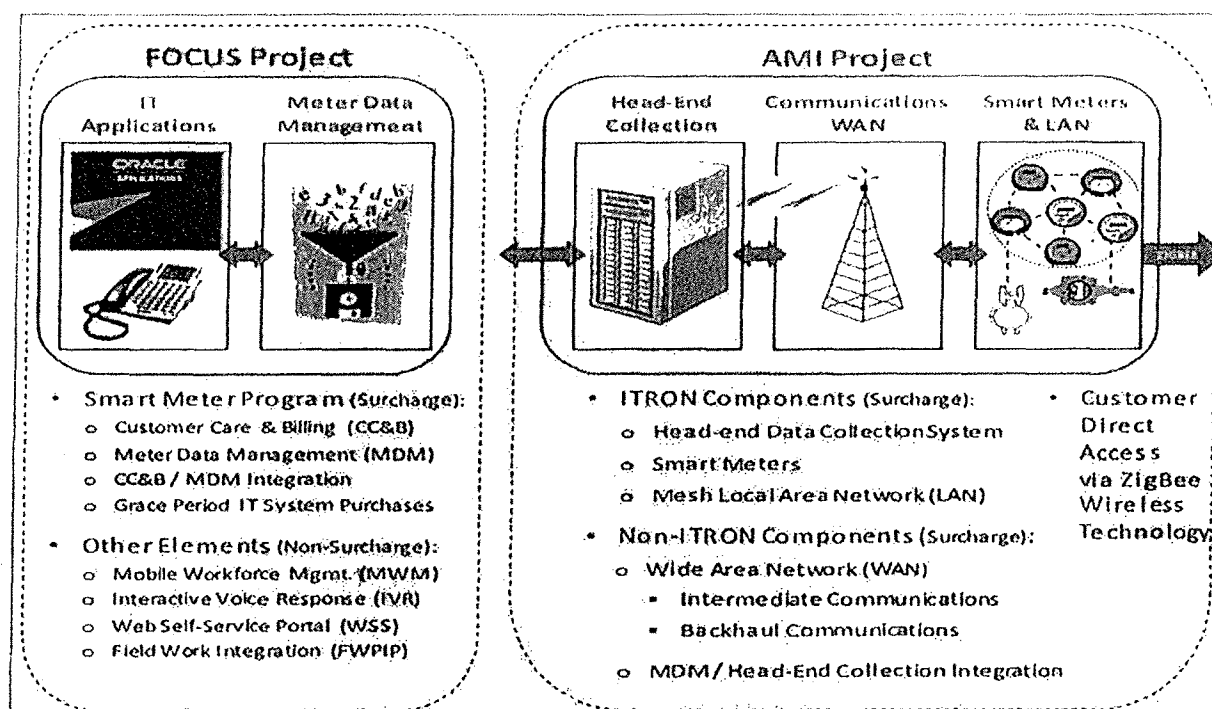
On December 13, 2011, the Commission issued a Secretarial Letter granting the Company's request for an extension, until June 30, 2012, to file its Final Smart Meter Plan. Pursuant to the Commission's December 13, 2011 Secretarial Letter, Duquesne Light hereby files its Final Smart Meter Plan.

III. FINAL SMART METER PLAN

A. INTRODUCTION

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



Under the FOCUS project, Duquesne Light is replacing 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 is 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

Duquesne Light Company – Final Smart Meter Plan

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 seven-year period. The seven-year period includes a two-year ramp up period to allow systems testing before they are implemented on a broader scale. At the end of the two-year ramp up period, the Company proposes a deployment schedule of 9,000 meters per month with full deployment by the end of 2020. 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.

The total Smart Meter Program will cost approximately \$238 million. 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.

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The FOCUS project encompasses 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 current customer information system ("CIS") is 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 cannot be supported without replacing Duquesne Light's existing CIS. Furthermore, Duquesne Light's existing back-office IT architecture is not designed for the proliferation of data inherent in providing hourly or even more granular interval usage information to all of our customers on a daily basis. Therefore, in conjunction with replacing our CIS, Duquesne Light must implement an MDM system as well as integrate this new system with the replacement CIS.

As part of FOCUS project scope within Duquesne Light's Smart Meter Program, the Company is now implementing the Oracle Customer Care and Billing ("CC&B") module within the Utility Application Suite to replace our existing CIS. In addition, Duquesne Light has purchased the Oracle MDM module and is currently implementing this component of the Utility Application Suite as well as integrating it 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 is an integral part of Duquesne Light's Plan for meeting Act 129 and the Commission's *Implementation Order* requirements.¹

The FOCUS project started in July 2010 after Commission approval of the Company's Initial Smart Meter Plan and is projected to be completed by the end of the second quarter of 2013. There are five general phases during the FOCUS project lifecycle and timeline is as follows:

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.

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- Discovery (Define Scope): July 2010 to November 2010
- Analysis (Gather Requirements): December 2010 to August 2011
- Assembly (Design & Build): August 2011 to May 2012
- Acceptance (Test & Train): June 2012 to March 2013
- Deployment (Go-Live & Support): April 2013 to June 2013

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 this filing, Duquesne Light describes 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.

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

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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.

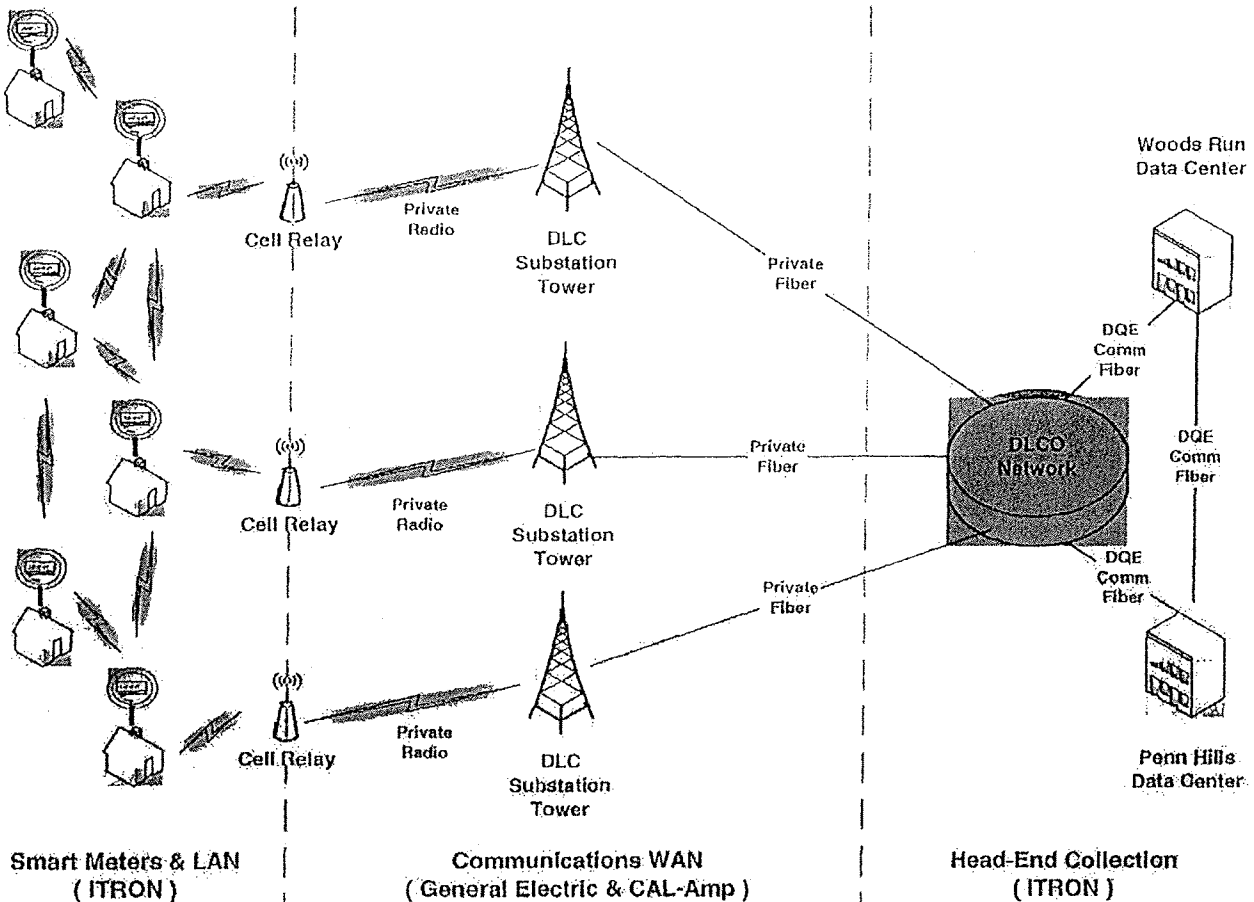
Duquesne Light's proposed AMI solution includes four components. These four components are:

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

Diagram 2 below provides an overview of the AMI System Components.

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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 ZigBee² 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.

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.

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2. Smart Meters

Duquesne Light proposes 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. 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.

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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.

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

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

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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 Final 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

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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

5. Technical Advantages of the New AMI System

There are several distinct technical advantages associated with the proposed 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 proposed 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 that in turn communicates its data to a neighboring meter and this process continues until the data is

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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 must install a Head-End Data Collection Engine. 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.

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- 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

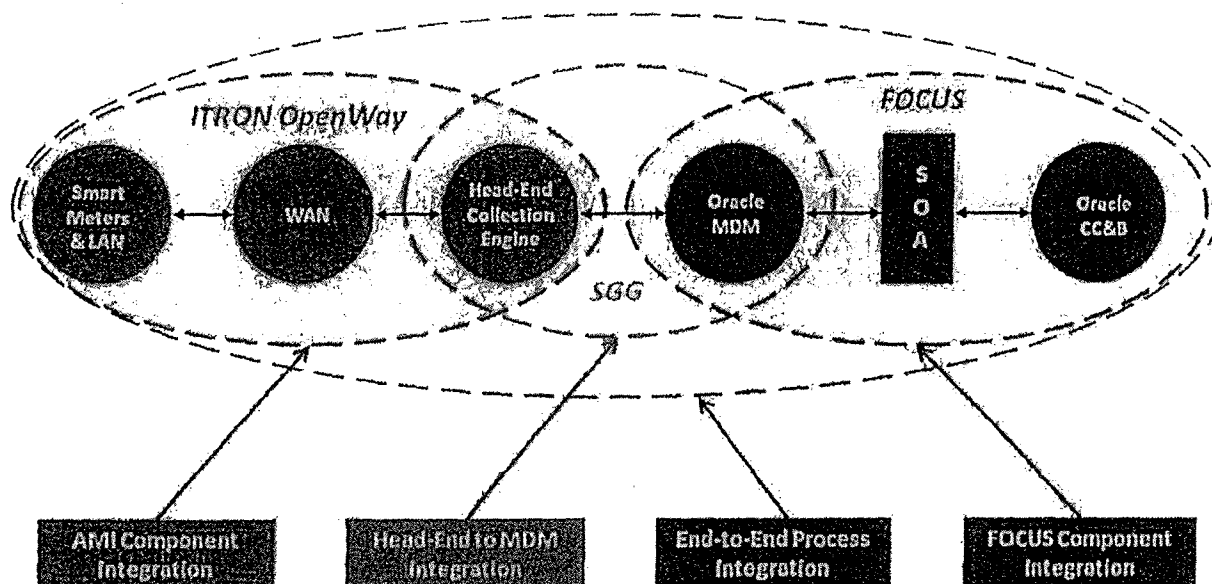
In addition to the AMI Project scope described in the section above, Duquesne Light's Final Smart Meter Plan includes the implementation, ongoing support and multifaceted integration of several IT systems. Some of the more significant of these IT systems such as Oracle's CC&B and MDM will be implemented and integrated as part of the Focus Project but will 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. Duquesne Light will embark on a formal RFP process to select a qualified SI in the latter half of 2012. Duquesne Light also plans to negotiate a contract with the selected SI that will be executed upon approval of our final Smart Meter Plan.

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 LAN and the WAN. The Smart Meter

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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 HAN devices.

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:

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

4. Systems Integrator

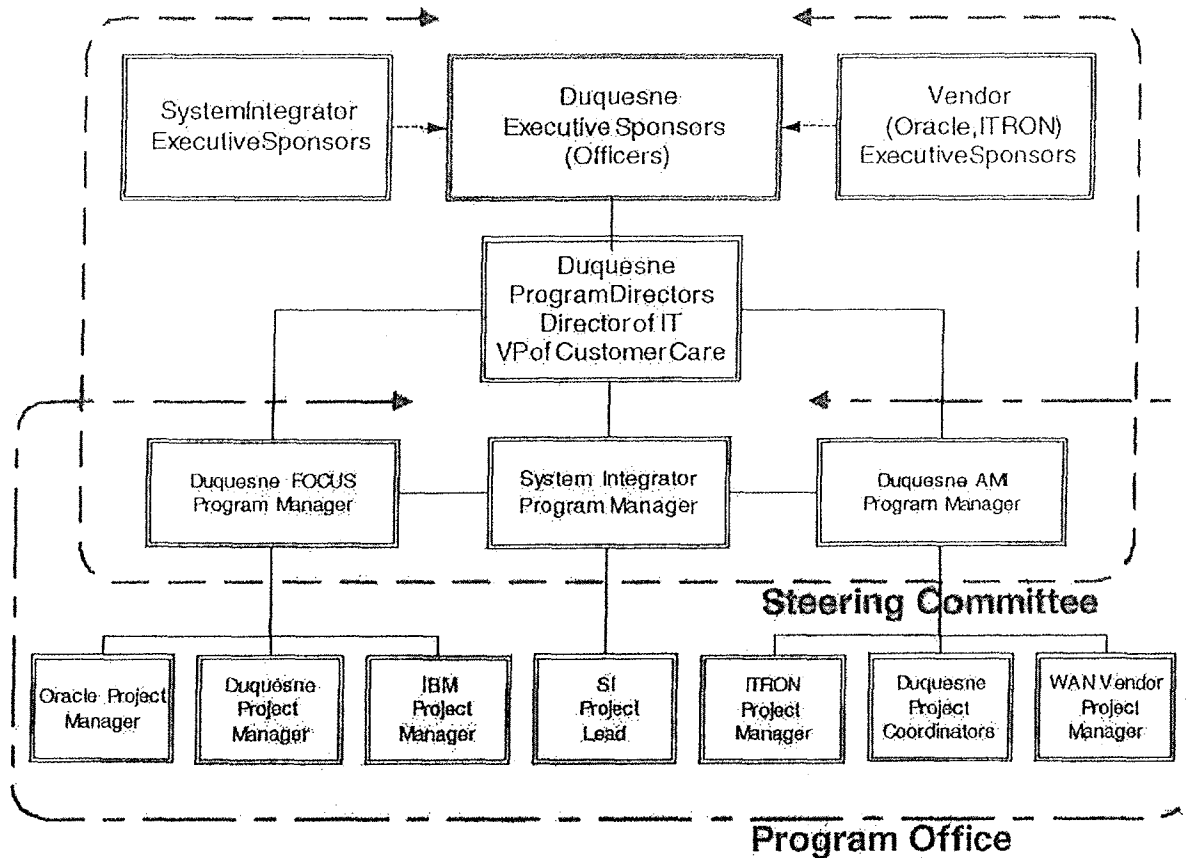
The complexity of integrating multiple IT systems from multiple vendors across several lines of business such as customer care and metering operations along with deploying all new advanced meters and communication networks requires specific expertise across several technology disciplines that does not exist internally within Duquesne Light. Therefore, Duquesne Light plans to engage 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 being performed by other vendors including 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, SI, Oracle, ITRON and other vendor resources will be established to manage and monitor the execution of this plan.

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Diagram #4: Duquesne Light Smart Meter Program Management Office



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

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business processes. The specific services provided by the SI are detailed in Appendix F to this plan.

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.

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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

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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.

There is an additional cost of approximately \$30 per single phase meter to install the switch to enable the remote disconnect/reconnect functionality. In addition, the Company's FOCUS system would require upgrades costing approximately \$500,000 to provide this functionality. The expected cost to install this functionality on a system wide basis is approximately \$17.5 million.

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Duquesne Light believes that the benefits of this functionality support implementation. For these reasons, Duquesne Light proposes 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.

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.

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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.

In order to report voltage data in a manner that allows an EDC to react to the information, an interface needs to be developed between the AMI Head-End Collection Engine and the FOCUS project MDM system. Duquesne Light's approach to developing these type of interfaces is to participate in Oracle's Smart Grid Gateway ("SGG") Customer Validation Program. This program enables Duquesne Light to influence the development of productized integration between ITRON and Oracle applications. At this point in the development cycle, Oracle has not

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committed to a date for implementing the voltage monitoring interface requirements as part of their SGG roadmap so incremental cost information is unavailable.

In addition to developing the integration between AMI and FOCUS systems, new reporting functionality will need to be developed within the MDM application in order for Duquesne Light to react to the voltage monitoring. At this point in the MDM development roadmap, Oracle has not committed to a date for adding enhanced reporting functionality for voltage monitoring.

Since Oracle has not committed to dates for voltage monitoring capabilities, the incremental cost for developing the required productized integration and reporting functionality is unknown. However, Duquesne Light anticipates that it will implement the voltage monitoring capability, as a supplement to existing power quality systems, once the necessary software becomes available.

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 would need to replace its current Outage Management System ("OMS") as well as develop and maintain a distribution system "Electrical Model". This replacement initiative is not included in the scope of the FOCUS project.

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Duquesne Light estimates that the incremental cost to create an Electrical Model are not justified as part of the Company's Final Smart Meter Plan, but will be further evaluated as the AMI system is deployed.

Duquesne Light does plan to implement the capability to communicate outages and restorations from the Smart Meters to the Head-End Collection Engine as part of the AMI project. In addition, Duquesne Light plans to extract the data from the Head-End Collection Engine into an AMI data warehouse on a near real-time basis. The data warehouse will include reporting functionality that provides the Company's Operations Center with the following data:

- Number of customers that are out of power at any given time during an outage event.
- A list of customers that have been restored at any given time during an outage event.
- The length of time between when a customer lost power and when that customer's power was restored.

This reporting functionality in the AMI data warehouse will replace and improve the accuracy of all of the information that the Company's Operations Center currently receives from its existing AMR system. This initiative is estimated to cost approximately \$250,000.

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

A chart showing the Company's proposed AMI implementation timeline is provided as Appendix G. The timeline includes a smart meter deployment schedule that begins with a 5,000 smart meter acceptance roll out in 2014 followed by ramp up to 90,000 meters by year end 2015.

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A full scale deployment of 9,000 meters per month will begin in the first quarter of 2016. The Company anticipates that it will complete full deployment of its smart meters by the end of 2020. In its Initial Smart Meter Filing, Duquesne Light noted that it was premature to develop a final system-wide deployment schedule given the substantial tasks that the Company was undertaking to: (1) assess needs, and (2) select technology, a vendor, software, hardware and other smart meter components. Therefore, the Company noted its intent to meet the 15 year deployment schedule set forth in the Commission's *Implementation Order*. See Duquesne Light Initial Smart Meter Plan, pp. 36-37. The Company did provide an initial estimated date of December 31, 2018 for full system roll out of smart meters. However, the Company explained that this date was not final and that the Company would provide a detailed description of its plans for full system-wide roll out of smart meter technology as part of its Final Smart Meter Plan. See Duquesne Light Initial Smart Meter Plan, p. 37.

In the Commission's Order approving the Company's Smart Meter Plan, the Commission noted that Duquesne Light had provided an approximate date of December 31, 2018 to complete system-wide deployment of smart meters. The Commission further noted that Duquesne Light had explained that the dates were approximate and that it was the Company's intent to meet the 15 year deployment schedule provided by Act 129. *Petition of Duquesne Light Company for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123948, Order entered May 11, 2010, p. 27.

The Company is extending full deployment of smart meters to allow for the two-year ramp-up period described above. This ramp-up period will give the Company time to test systems and functions before implementing technology on a system-wide basis. The Company believes that this is a prudent and reasonable approach and that it will mitigate the risk of technology glitches that could create a negative experience for customers.

In addition to the ramp-up period, Duquesne Light 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 automatic control of electric consumption. This phased functional implementation is designed to

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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.

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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 outside of the Company's planned smart meter deployment schedule since the AMI project will not start until the Final Smart Meter Plan is approved.

Duquesne Light Company – Final Smart Meter Plan

a. New Construction

Duquesne Light installs approximately 2,000 meters annually in new construction sites throughout its service territory. At the end of the grace period, Duquesne Light plans to install ITRON smart meters at all new residential construction sites and communicate 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

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 plans to install 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 plans to install Alpha meters (currently used on C&I accounts) and communicate with them through its existing AMR ITRON MV-90 system for both billing and next day usage data access purposes. After the Smart Meter Program Final Smart Meter Plan is approved by the Commission, Duquesne Light will purchase, implement and integrate the ITRON Head-End Data Collection Engine with the MDM. Once this work is complete, Duquesne Light will install ITRON smart meters for all customer requests and communicate with them directly via a public cellular network. This solution is projected to be available during the smart meter deployment ramp-up period and will be utilized until the new communication

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network is extended to these locations as part of the full deployment schedule. 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.

G. SMART METER PROGRAM COSTS

The total cost of Duquesne's Smart Meter Program is estimated at \$238 million spent over an 11 year period beginning in 2010 and ending in 2020. The following table provides a breakdown of the total Smart Meter Program estimated costs by scope component and operating versus capital expenditures.

Cost Estimates (\$ millions)	Total
Smart Meter Program Planning	3.0
FOCUS Project	35.0
AMI Project Vendor Components (ITRON)	97.5
AMI Project Communication Network (WAN)	8.0
AMI Project IT Systems including PMO	63.4
AMI Project Customer Acceptance	3.1
AMI Project Contingency	28.0
Total	\$238.0

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

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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 FOCUS Project costs encompass all of the IT system costs necessary to replace Duquesne Light's CIS and implement a new MDM. These IT system costs include software and hardware purchases and maintenance during the grace period; outside services involved in the implementation and integration of CC&B and MDM; and an allocation of other ancillary project expenditures such as facilities, training, organizational change management and installation of supporting IT products.

The AMI Project Vendor Component costs encompass all of the equipment and services being provided by ITRON as described in Section C of this Plan. These cost estimates are based on the contract negotiations that have been conducted to date between Duquesne Light and ITRON. These negotiations are expected to conclude in the third quarter of 2012 with a completed contract that can be executed upon Commission approval of the Company's Final Smart Meter Plan.

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 IT Systems costs also encompass the responsibilities of the PMO which includes third party SI resources as well as the following seven Duquesne Light internal resources which are all incremental to the Company's current staffing levels:

- AMI Program Manager (1)

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- AMI IT Systems Coordinator and IT Systems Analyst (2)
- AMI Metering Coordinator and Metering Engineer (2)
- AMI Communication Network Coordinator and Telecom Engineer (2)

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 AMI Project contingency costs encompass industry standard funding reserves for third party services as well as specific funding reserves for areas of the program where meter deployment, communication protocol, and security appliance decisions still need to be finalized based on emerging or evolving additional information.

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.

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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%.

The Company is proposing to recover the costs for implementing its Final Smart Meter Plan through its existing SMC without modification.

I. CUSTOMER EDUCATION AND ACCEPTANCE STRATEGY

1. Introduction

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.

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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, RTP programs and HAN offerings 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 signed 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 accompanies the installers to provide 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	CSPs provide energy and demand response products to

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Service Providers (CSPs)	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.

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

1. Establish a website that contains 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 include:

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- 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 daily 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 display (similar to other mobile smart meter/grid displays used by utilities, such as Oncor's Mobile Experience Center and Reliant Energy's Smart Home Solutions recreational vehicle). The likely venues for these outreach presentations include community groups (Chambers of Commerce, Rotary, citizens' councils, political groups), homeowners' associations, and community events (street fairs, farmers' markets, and athletic events). 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.

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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.

Three 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 provide customers as precise a time as possible for when the meter will be installed.

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 immediate, on-call support to customers or, when not otherwise engaged, door-to-door outreach.

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, customers who have signed up for Duquesne Light's My Account service or otherwise provided Duquesne Light an email address will receive a notification that their smart meter services (bill-to-date, bill alerts, projected bill, and hourly usage data) are now available to them online.

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.

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First, prior to launching the CEA plan, Duquesne Light will conduct focus group tests to ensure that the approach, themes, messages, media, and methods meet customer requirements. Additionally, Duquesne Light will administer a baseline survey that gathers customer attitudes toward the smart meter system prior to implementation. This baseline survey will enable Duquesne Light to then determine the impact of the CEA plan on consumer attitudes.

Second, after implementing the 90-60-30 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.

Third, 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)

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- 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

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- 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 deployment of 9,000 meters per month by the end of 2015. 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.

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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.

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IV. CONCLUSION

As explained herein, during the Grace Period, 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's Final Smart Meter Plan will provide all of the smart meter capabilities required under Act 129 and the Commission's *Implementation Order* to customers in a cost-effective manner.

Appendix Tab 3

**PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA 17105-3265**

Public Meeting held April 4, 2013

Commissioners Present:

Robert F. Powelson, Chairman
John F. Coleman, Jr., Vice Chairman
Wayne E. Gardner
James H. Cawley
Pamela A. Witmer

Petition of Duquesne Light Company for
Approval of Its Final Smart Meter
Procurement and Installation Plan

M-2009-2123948

OPINION AND ORDER

BY THE COMMISSION:

Before the Pennsylvania Public Utility Commission (Commission) for consideration and disposition is the Initial Decision (I.D.) of Administrative Law Judge (ALJ) Katrina L. Dunderdale, issued on January 14, 2013, relative to the Petition of Duquesne Light Company (Duquesne or the Company) for Approval of Its Final Smart Meter Procurement and Installation Plan (Final SMP). A Joint Petition for Approval of Full Settlement of All Issues (Joint Petition) was filed on December 7, 2012, by Duquesne and the Office of Consumer Advocate (OCA) (Joint Petitioners). For the reasons fully delineated herein, we shall grant Duquesne's Petition as modified by this Opinion and Order.

I. Background

On October 15, 2008, House Bill 2200 was signed into law as Act 129 with an effective date of November 14, 2008. Among other requirements, Act 129 required Electric Distribution Companies (EDCs) to file smart meter plans within nine months after the effective date of Act 129. On June 24, 2009, the Commission issued its Smart Meter Implementation Order at Docket No. M-2009-2092655 (*Implementation Order*), which established the standards that EDCs must meet for providing smart meter technology to customers and also provided guidance for meeting those standards.

On August 14, 2009, Duquesne filed its Initial Smart Meter Procurement and Installation Plan (Initial SMP) with the Commission. The Commission entered an Order on May 11, 2010, approving Duquesne's Initial SMP, with certain modifications. Pursuant to the May 11, 2010 Order, Duquesne was required to file certain periodic updates with the Commission detailing its smart meter implementation status. First, on July 1, 2010, Duquesne filed a Cost Benefit Analysis for the additional smart meter capabilities identified in the Implementation Order. Next, on December 29, 2010, Duquesne filed its Application for Approval of Assessment of Needs, Technology Solutions and Vendor Selection. In that Application, the Company provided a detailed assessment of its Advanced Meter Infrastructure (AMI) technology requirements, possible solutions and selection of technologies and vendors. Duquesne then filed a Supplement to its Assessment Application on January 31, 2011, wherein it identified Itron, Inc. as its recommended primary contractor to design, construct, implement and oversee the Company's SMP.

On November 18, 2011, Duquesne filed a status update with respect to its SMP and requested a six month extension, from December 31, 2011 to June 30, 2012, to file the Company's Final SMP. Duquesne's request for an extension was granted via a Commission Secretarial Letter issued on December 13, 2011.

II. Procedural History

On June 29, 2012, Duquesne filed its Petition for Approval of its Final Smart Meter Plan in which it requested final approval from the Commission of its Final SMP. On July 23, 2012, the OCA and Citizen Power, Inc. (Citizen Power) filed Answers to Duquesne's Petition. By Secretarial Letter issued August 17, 2012, the Commission notified the Parties that this matter had been referred to the Office of ALJ for further proceedings.

An initial Prehearing conference was held on September 17, 2012, and a further Prehearing Conference was held on November 15, 2012, wherein representatives from Duquesne, the OCA, Duquesne Industrial Intervenors (DII) and Citizen Power attended. Subsequent to the further Prehearing Conference, the Parties were able to reach a settlement in principle of all issues. On December 7, 2012, the Joint Petitioners filed the Joint Petition in which the Parties agreed to resolve all issues related to Duquesne's Final SMP. The record closed on December 21, 2012, upon expiration of the time in which interested Parties could object or comment on the Petition. All of the active Parties in this proceeding either support or do not oppose the settlement.

On January 14, 2013, ALJ Dunderdale issued an Initial Decision wherein she granted the Joint Petitioners unopposed settlement without modification. No Exceptions to the Initial Decision were received. Nevertheless, we have exercised our right to review the Initial Decision pursuant to 66 Pa. C.S. § 332(h).

III. Discussion

We note that any issue that we do not specifically address has been duly considered and will be denied without further discussion. It is well settled that the

Commission is not required to consider, expressly or at length, each contention or argument raised by the parties. *Consolidated Rail Corporation v. Pa. PUC*, 625 A.2d 741 (Pa. Cmwlth. 1993); *see also, generally, University of Pennsylvania v. Pa. PUC*, 485 A.2d 1217 (Pa. Cmwlth. 1984).

A. Legal Standards

As the proponent of a rule or order, the Company has the burden of proof in this proceeding in accordance with Section 332(a) of the Public Utility Code (Code), 66 Pa. C.S. § 332(a). Courts have held that “[a] litigant’s burden of proof before administrative tribunals as well as before most civil proceedings is satisfied by establishing a preponderance of evidence which is substantial and legally credible.” *Samuel J. Lansberry, Inc. v. Pa. PUC*, 578 A.2d 600 (Pa. Cmwlth. 1990), *alloc. denied*, 529 Pa. 654, 602 A.2d 863 (1992). That is, the Company’s evidence must be more convincing, by even the smallest amount, than that presented by the other Parties. *Se-Ling Hosiery, Inc. v. Margulies*, 364 Pa. 45, 70 A.2d 854 (1950). Additionally, this Commission’s decision must be supported by substantial evidence in the record. More is required than a mere trace of evidence or a suspicion of the existence of a fact sought to be established. *Norfolk & Western Ry. Co. v. Pa. PUC*, 489 Pa. 109, 413 A.2d 1037 (1980).

Because the Joint Petitioners have reached a full settlement of the issues and claims that arose in this proceeding, the Joint Petitioners have the burden to prove that the Settlement is in the public interest. Pursuant to our Regulations at 52 Pa. Code § 5.231, it is the Commission’s policy to promote settlements. Settlement terms often are preferable to those achieved at the conclusion of a fully litigated proceeding. In addition, a full settlement of all the issues in a proceeding eliminates the time, effort and expense that otherwise would have been used in litigating the proceeding, while a partial settlement may significantly reduce the time, effort and expense of litigating a case.

Regulatory proceedings often are expensive to litigate, and the reasonable cost of such litigation is an operating expense recoverable in the rates approved by the Commission. Partial or full settlements allow the parties to avoid the substantial costs of preparing and serving testimony, cross-examining witnesses in lengthy hearings, and preparing and serving briefs, reply briefs, exceptions and reply exceptions, together with the briefs and reply briefs necessitated by any appeal of the Commission's decision, yielding significant expense savings for the company's customers. For this and other sound reasons, settlements are encouraged by long-standing Commission policy.

The Commission must, however, review proposed settlements to determine whether the terms are in the public interest. *Pa. PUC v. Philadelphia Gas Works*, Docket No. M-00031768 (Order entered January 7, 2004); *Pa. PUC v. C.S. Water and Sewer Assoc.*, 74 Pa. P.U.C. 767 (1991); *Pa. PUC v. Philadelphia Electric Co.*, 60 Pa. P.U.C. 1 (1985). In order to accept a settlement such as that proposed here, the Commission must determine that the proposed terms and conditions are in the public interest. *Pa. PUC v. York Water Co.*, Docket No. R-00049165 (Order entered October 4, 2004); *Pa. PUC v. C.S. Water and Sewer Assoc.*, *supra*.

B. Joint Petition for Approval of Full Settlement

1. Introduction

As stated previously, on December 7, 2012, the Joint Petitioners filed the Settlement. The Joint Petitioners state that the Settlement has been agreed to, or is not opposed, by all active Parties in this proceeding, noting that the Office of Small Business Advocate (OSBA), DII and Citizen Power have indicated that they do not oppose the Settlement. According to the Joint Petitioners, the Settlement resolves all issues in this proceeding and is in the best interests of Duquesne, the Joint Petitioners and the Company's customers. Settlement at 6. The Settlement provides for the approval of Duquesne's Final

SMP with certain clarifications and modifications that provide for additional customer education regarding smart meter technology and deployment and that provide for additional protection of customer data and the security of the distribution system. In addition, the Settlement provides that the Company will meet with stakeholders to obtain input on a plan to allow low-income customers to use smart meter technology to reduce their energy bills.

2. Terms and Conditions of the Full Settlement

The Settlement consists of the Joint Petition containing the terms and conditions of the Settlement, and five appendices. Appendices A and B to the Settlement are the Statements in Support of Settlement submitted by Duquesne and the OCA, respectively. Appendices C through E to the Settlement are the letters of non-opposition of the OSBA, DII and Citizen Power, respectively.

The essential terms and conditions of the Settlement are set forth in Section II, as follows:

II. SETTLEMENT TERMS AND CONDITIONS

19. Duquesne Light's Final Smart Meter Plan is approved with the following clarifications and/or revisions.

a. Customer Education and Research Metrics

20. Within 60 days from the final order in this proceeding, the Company shall arrange to meet with the OCA and interested parties to obtain input on a plan to research the actual experiences of low-income customers to determine how such customers may be able to use smart meter technology to reduce their energy bills and to incorporate information regarding such customers into the Company's Customer Acceptance and Education Plan performance metrics. The Company also agrees to meet with the OCA and

interested parties to obtain input to research the actual experiences of low use (base load usage below 500 kWh), medically needy (customers with Chapter 56 medical certifications at the time a smart meter is installed) and other vulnerable customers to the extent such customers can be reasonably identified, and as agreed to between the Company and the OCA, provided that the Company will not be required to research other vulnerable customers if such agreement cannot be reached. The meeting(s) will establish a review and reporting process and a timeline for deliverables. The timeline in the plan will align with scheduled smart meter deployment estimated to begin in the fourth quarter of 2014. With regard to researching the experiences of customers described above, the parties may consider the Company's gathering and sharing with interested parties' non-confidential information regarding such customers' load shapes and usage characteristics as a means of informing the design of potential programs to enable such customers to benefit from smart meter technology.

21. The Company will propose any potential customer education measures for Time-of-Use ("TOU") rates when it files for Commission approval of a TOU program under Act 129. The Company will seek Commission approval of such measures in conjunction with such TOU program. All Parties to this Settlement reserve their rights to contest the Company's proposed allocation of customer education costs in that filing.

b. Reasonable and Adequate Service

22. Duquesne Light shall comply with all provisions of Chapter 14 of the Pennsylvania Public Utility Code (66 Pa. C.S.A. Chapter 14) and Chapter 56 of the Commission's regulations (52 Pa. Code Chapter 56) with respect to the application of remote connect and disconnect. Specifically, Duquesne Light will:

- a) Send an appropriately trained representative to the customer premise before any termination is scheduled to occur. The representative will use reasonable efforts to make personal contact with a

responsible adult occupant of the premise prior to the termination.

b) Where personal contact is not made prior to termination, the representative shall leave conspicuously at the residence a notice informing the customer that utility service is being disconnected and how the customer can effect reconnection. The notice shall include the number of a hotline where low-income and vulnerable customers can receive information on all Duquesne Light Universal Service and Energy Conservation programs and related payment information.

c) Service shall not be terminated if the customer can show confirmation of payment through either authorized agent or automated payment systems. The representative shall be fully trained to direct low income and vulnerable customers to a hotline where they can receive information on all Duquesne Light's Universal Service and Energy Conservation program and related payment information.

d) On or before October 1, 2016, Duquesne Light shall make a tariff filing with the Commission to reduce its restoration fee for reconnection where the remote feature is used.

23. Duquesne Light will investigate alternatives for Voltage Monitoring functionality if the capability doesn't exist within the Oracle software solution by 2016.

c. Privacy and Security

24. During the first quarter of 2013, the Company shall hire a third party consultant to assist the Company in developing a privacy policy for customers' smart meter data. The development of said policy shall be carried out in consultation with interested stakeholders and shall be the subject of at least semiannual meetings with stakeholders during the development of the privacy policy. The third party consultant will be asked to report on the range of practices of

other U.S. EDCs with respect to privacy policies for smart meter data. The allowed cost for this study shall not exceed \$40,000.

25. Duquesne Light will conduct a vulnerability assessment across the entire Advanced Metering Infrastructure (AMI) solution including penetration testing at the meter to validate the cyber security of its AMI system.

d. Miscellaneous Issues

26. Duquesne Light will adopt the “Green Button Initiative” in providing consumption data to customers. This standardized data format will enable customers to utilize smart phone applications developed by third parties.

27. The Company shall be permitted to recover any additional costs associated with implementing the terms and conditions of this Settlement through its SMC, except as limited herein.

28. The Joint Petitioners aver that the petitions and applications at Docket No. M-2009-2123948, that preceded the Company’s Final Smart Meter Plan, have been incorporated therein, as modified by the Final Smart Meter Plan, and all issues associated with those filings have been fully resolved by the instant Settlement. The Joint Petitioners further aver that no further action is required on the petitions and applications that preceded the Final Smart Meter Plan.

Settlement ¶¶ 19-28 at 6-10.

On the basis of these and other provisions of the Settlement, the Joint Petitioners request that the Commission approve the Company’s Final SMP including all the terms and conditions embodied in the Joint Petition for Settlement, without modification.

3. Disposition of the Full Settlement

The Joint Petitioners assert that approval of the Settlement is in the public interest because it provides for: (1) additional customer education regarding smart meter technology and deployment and ensures stakeholder input on these issues, and (2) the protection of customer data and the security of the distribution system. The Joint Petitioners further assert that the Settlement reduces administrative burden on the Parties and the Commission by avoiding the expense and uncertainty attended with a fully litigated proceeding and administrative adjudication. Settlement at 10.

The proposed Settlement is conditioned upon Commission approval of its terms and conditions without modification. According to Paragraph 31 of the Settlement, in the event that the Commission modifies the Settlement, any Joint Petitioner may elect to withdraw from the Settlement and proceed with litigation. In that event, the entire Settlement automatically shall be void and of no effect. Paragraph 31 provides that this Settlement may be withdrawn upon written notice to the Commission and all Parties five days from the date of the entry of the Commission Order denying or modifying the Settlement. The Settlement is made without any admissions against, or prejudice to, any position that any Joint Petitioner may adopt in any future litigation. In addition, the Joint Petitioners have agreed that the terms of the Settlement may not be cited as precedent in any future proceeding, and that the Commission's approval of the Settlement shall not be construed to represent approval of any Joint Petitioner's position on any issue, except as required to implement the terms of the settlement in this and future proceedings involving Duquesne. The Joint Petitioners agree that the Settlement is a compromise, and does not necessarily represent the position that a Joint Petitioner would advance in a litigated proceeding. *Id.* at 11.

As stated above, all Parties to this proceeding either support, or do not oppose, the terms of the Settlement. The Settlement provides for certain modifications to

the Final SMP Plan initially proposed by Duquesne, and represents a compromise among the Joint Petitioners that resolves all of the issues that have been raised in this proceeding. The Parties are to be commended for reaching an amicable Settlement on such a complex filing.

Based on our review of the record, we conclude that the proposed Settlement is in the public interest, and we shall approve it with the exception of several issues which remain to be addressed in order for Duquesne's SMP to comply with its statutory objectives. First, pursuant to Act 129 of 2008, Smart Meter Technology must enable the use of time-of-use (TOU) rates and real time pricing (RTP). 66 Pa. C.S. § 2807(g). Customers can elect to participate in TOU rates and real time pricing. See 66 Pa. C.S. § 2807 (f) (5). In our *Implementation Order*, we established additional meter capability requirements including, *inter alia*, that the smart meter must have the capability to support the net metering of customer generators. It is unclear whether Duquesne's SMP satisfies these criteria.

To satisfy the statutory smart meter capability requirements and requirements set forth in the *Implementation Order*, it is necessary that Duquesne's SMP provide for changes to Duquesne's settlement and customer profile processes. Currently, for monthly metered customer accounts, Duquesne uses a standard customer class average profile when allocating energy costs to customers. Individual customer hourly usage is interpolated from this standard class profile. As such, if an individual customer reduces usage during an on-peak hour, that monthly metered customer does not get the benefit of any cost savings for that on-peak reduction when Duquesne allocates hourly energy payment responsibility to the electric generation supplier serving that customer. This is why TOU rates and RTP programs cannot be effectively implemented without using hourly interval meters.

However, the meter alone is not enough for Duquesne to be capable of providing TOU rates and RTP and supporting net metering of customer-generators. Duquesne must also modify its settlement processes to allocate energy to each customer according to their actual usage profile, for each hour, as recorded by the installed smart meter. This is exactly what Duquesne does for its existing large customers with currently installed interval meters. Without adjusting these settlement and profiling processes, incentives and efforts for customers to receive TOU and RTP offers, as well as the successful marketing of net metering offers, will be thwarted in contravention of the statute and the *Implementation Order*.

Duquesne proposes to gradually install smart meters between 2014 and 2020. Because of this long installation period, it will be necessary for Duquesne to implement these settlement and profiling process changes prior to the completion of all smart meter installations. Accordingly, Duquesne should file a supplemental SMP with the Commission providing a reasonable period, after installation of each smart meter, in which it will ensure that each customer gets its energy and capacity assignments based on the actual hourly energy usage of that customer. Customers should not be forced to wait years to be capable of receiving TOU, RTP and net metering pricing products.

The second unresolved issue with Duquesne's SMP relates to third-party access to customer meter data. This filing is designed as Duquesne's "Final Smart Meter Procurement and Installation Plan." Duquesne's Final SMP properly provides for the development of a web portal for the purpose of efficiently sharing certain limited customer authorized usage and service data with service providers of that customer.¹ However, the Final SMP does not provide the specifics of the web-based solution or how and when it will be implemented.

¹ Information sharing does not include sensitive customer financial data. Data access is limited to usage data required to efficiently and accurately price service offerings to customers.

By Order entered on December 6, 2012, at Docket No. M-2009-2092655, we directed the Electronic Data Exchange Working Group (EDEWG) to initiate a web-portal working group to develop a standardized solution for acquisition of interval usage data via a secure web-portal. It is our expectation that Duquesne and the other EDCs will be directed to update their smart meter technology and implementation plans when the work of this web-portal group has concluded. Any such updates would be for the purpose of implementing a standardized web-based solution, arising out of the working group and approved by the Commission, to provide authorized third parties with secure access to customer interval usage data.

Finally, we note that we previously directed that each plan shall include the individual costs for deploying and operating nine additional smart meter technology capabilities. *Implementation Order* at 30. Duquesne has indicated that the cost of the Voltage Monitoring and Communication of Outages and Restorations capabilities are not justified at this time. However, Duquesne failed to provide specific cost effectiveness data supporting its decision not to include these capabilities in the SMP.² Based on the record as developed, we are unable to determine whether Duquesne's circumstances merit a waiver of these capabilities.

Therefore, we shall direct Duquesne to make a compliance filing within ninety days of the date of entry of this Opinion and Order, specifying its proposed changes to settlements and profile processes, and providing data supporting whether or not inclusion of the Voltage Monitoring and Communication of Outages and Restorations capabilities are cost effective. We shall approve Duquesne's Final Smart Meter Plan as

² The Commission directed that deployment and operating costs of the additional capabilities be presented including a breakdown of all incremental costs and any associated potential operational and maintenance cost savings. *Id.* "All cost estimates must be supported by estimates from at least two vendors where available. To the extent that an EDC or another party demonstrates that a particular Commission imposed requirement is not cost-effective, the Commission will have the option of waiving a particular requirement for that EDC or all EDCs." *Id.* at 30-31.

modified by the Joint Petition for Full Settlement of all Issues in all other respects. We direct that the Parties to the Joint Petition provide written notice to the Commission and all Parties within five days from the date of the entry of this Opinion and Order whether they intend to withdraw from the Settlement based upon our directed modifications.

IV. Conclusion

For the reasons set forth, *supra*, we will grant Duquesne's Petition, approve the Joint Petition for Full Settlement, and approve Duquesne's Final Smart Meter Plan, as modified by, and consistent with, this Opinion and Order. Duquesne is directed to make a compliance filing within ninety days of the entry of this Opinion and Order, specifying its proposed changes to settlements and profile processes, and providing data supporting whether or not inclusion of the Voltage Monitoring and Communication of Outages and Restorations capabilities are cost effective; **THEREFORE,**

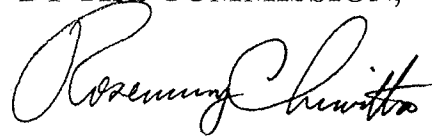
IT IS ORDERED:

1. That the Petition of Duquesne Light Company seeking approval of its Final Smart Meter Plan is granted, as modified by this Opinion and Order.
2. That the Joint Petition for Approval of Full Settlement of All Issues filed on December 7, 2012, is approved, as modified by this Opinion and Order.
3. That the Parties to the Joint Petition for Approval of Full Settlement of All Issues provide written notice to the Commission and all Parties within five (5) days from the date of entry of this Opinion and Order, whether they intend to withdraw from the Settlement based upon the Commission directed modifications. In the event no adverse comments are filed regarding the directed modifications, this Order shall be deemed final without further Commission action.

4. That Duquesne Light Company shall make a compliance filing within ninety (90) days of the date of entry of this Opinion and Order, specifying its proposed changes to settlements and profile processes, and providing data supporting whether or not inclusion of the Voltage Monitoring and Communication of Outages and Restorations capabilities are cost effective.

5. That any other interested Parties are directed to file comments on Duquesne Light Company's compliance filing submitted in response to Ordering Paragraph No. 4, above, within 120 days of the date of entry of this Opinion and Order.

BY THE COMMISSION,

A handwritten signature in cursive script, appearing to read "Rosemary Chiavetta".

Rosemary Chiavetta

Secretary

(SEAL)

ORDER ADOPTED: April 4, 2013

ORDER ENTERED: May 6, 2013

Appendix Tab 4

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainants,

No: C-2016-2571726

v.

DUQUESNE LIGHT COMPANY,

Respondent.

**RESPONDENT'S RESPONSES TO
SET #1 OF DISCOVERY REQUESTS**

Filed on Behalf of:
Duquesne Light Company

Counsel of Record for this Party:

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Paul Shane Miller, Esquire
PA. I.D. No. 319174

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainants,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

RESPONDENT'S RESPONSES TO SET #1 OF DISCOVERY REQUESTS

Respondent Duquesne Light Company ("Duquesne Light") submits the following Responses to Set #1 of Complainants' Discovery Requests:

GENERAL RESPONSES AND COMMENTS

1. Duquesne Light's responses to Complainants' Set #1 of Discovery Requests (the "Discovery Requests") are made to the best of its present knowledge, are based upon information currently known to Duquesne Light, and are given without prejudice to its right to change, supplement, and/or clarify its answers and responses, if necessary.
2. To the extent that the Discovery Requests purport to enlarge Duquesne Light's obligations beyond the requirements of the applicable rules of practice and procedure and/or imprecisely specify the information requested and/or documents requested, Duquesne Light has endeavored in good faith to produce discoverable information that can reasonably be identified as responsive to the Discovery Requests.
3. Duquesne Light's responses to the Discovery Requests are limited to the smart meters being installed in the company's service territory.
4. Duquesne Light's responses to the Discovery Requests are made subject to, and without in any way waiving or intending to waive, any objections as to the competency, relevancy, materiality, privilege or admissibility of evidence, for any purpose, of any of the

information provided and/or documents produced. In the event that any privileged information is divulged by Duquesne Light, its disclosure is inadvertent and does not constitute a waiver of any privilege.

5. Duquesne Light's responses to the specific Discovery Requests are written in bold font below.

DISCOVERY RESPONSES

1. State all technical, functional, and operational characteristics (i.e. how it actually operates and is operated in the field) of Your Smart Meter (the SK9AMI7) in Your Smart Grid, including but not limited to:

- a. What versions (standard Meter, Collector Meter, etc.) of Your Smart Meter (the SK9AMI7) are you installing on customer's residences? How are they different?

Duquesne Light is installing the HW 3.1 OpenWay CENTRON singlephase meter on all residential structures within its service territory.

- b. What are the makes and models of all wireless communications modules in each version of Your SK9AMI7? What are their purpose, function, capability, and operational characteristics?

The 900MHz communication module within the OpenWay CENTRON meters being installed in Duquesne Light's service territory is an Itron-designed proprietary circuit board. The 2.4GHz wireless interface is also an Itron proprietary design and integrated to the meter register circuit board. Both of the radios fall under the FCC ID: SK9AMI7. It is unclear what specific additional information is being sought by this request, but see Duquesne Light's responses to the remaining requests for additional information.

- c. What is the Absolute Peak Power Output of the 900 MHz RF transceiver and the 2.4 GHz Zigbee transceiver in each version of Your SK9AMI7 Smart Meter?

The technical details for both radios in SK9AMI7 are shown below:

Technical Information 900 MHz LAN Radio

**Antenna Type: Quarter Wave Embedded Slot Antenna
Antenna Gain: 2.2dBi
Transmitter Conducted Power: 28.38dBm, 688.65mW
Maximum System EIRP: 30.58dBm, 1142.88mW**

Technical Information 802.15.4 Zigbee Radio

Antenna Type: Quarter Wave Embedded Slot Antenna

Antenna Gain: 3.8dBi

Transmitter Conducted Power: 18.13dBm, 65.01mW

Maximum System EIRP: 21.93dBm, 155.96mW

d. What is the Gain of the antenna(s) of each version of Your Smart Meter, in the direction of maximum gain, at each of the frequencies of operation (900 MHz, 2.4 GHz)?

See response to Discovery Request #1(c).

e. What is the exact Transmission Burst Time interval of each version of Your SK9AMI7?

The OpenWay network deployed within Duquesne Light's service territory operates as a frequency-hopping, mesh network. When transmitting, each device will transmit for up to 150 milli-seconds in each time slot.

f. What is the complete Duty Cycle range (minimum, average, maximum) of each version of Your Smart Meter (the SK9AMI7), and their corresponding Transmission Times in 24 hours (900 MHz, 2.4 GHz)?

The transmit duty cycle for the 900MHz radio within the OpenWay network deployed within Duquesne Light's service territory will vary based on a number of factors, including, but not limited to, where in the mesh network topology the meter is located, the quality of the radio links to neighboring meters, and the level of interference present. Therefore, the most accurate way to estimate the transmit duty cycle is from a statistically significant sample of a representative deployment. The table below shows the Mean, Maximum, Minimum and Median transmit duty cycle for a sample of approximately 7,000 meters over a representative 24-hour window of operation.

	Duty Cycle	Time
Mean	0.05%	40.8 seconds per day
Maximum	0.08%	69.1 seconds per day
Minimum	0.01%	8.6 seconds per day
Median	0.05%	40.8 seconds per day

The OpenWay meter's 2.4GHz Zigbee radio communicates with other HAN (Home Area Network) devices. The table below shows the measured transmission times for an idle Zigbee radio and a Zigbee radio with one of two

sample devices joined to the meter. Duquesne Lights expects that, for current deployments, the average meter will have either zero (idle) or one HAN device attached to it.

	Duration of transmission in a 24-hour period	Duty Cycle
DS-SS Radio (no devices joined)	9.5 seconds	0.01%
Meter with radio (no devices joined)	13.2 seconds	0.05%

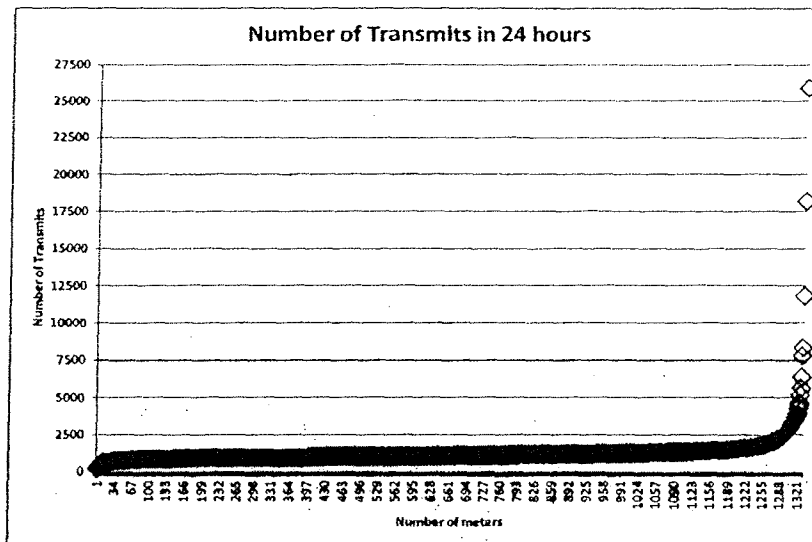
g. What is an average and maximum total duration time (in seconds) that each version of Your residential Smart Meter transmits and/or receives any signal in a 24 hour period (900 MHz, 2.4 GHz)? How is this computed or measured?

See response to Discovery Request #1(f).

h. How many times/transmissions in total (average, maximum) for any purpose is each version of Your Smart Meter configured to transmit during a 24-hour period (900 MHz, 2.4 GHz)?

This will vary depending on business process, which will determine how read schedules are set up. Typically, there are three to four scheduled reads from each meter in a 24-hour period. With a hierarchical cell structure, meters will relay upstream and downstream traffic within the RF mesh. The total number of transmissions will include the scheduled reads, on-demand reads, and alarms/alerts along with the network traffic needed for command and control (synchronization, security, data integrity and dynamic network resiliency). Based on data gathered from a large, representative OpenWay network deployment (two load profile reads + one register read + one event read per day), the total transmissions are:

- The average number of transmissions in a 24-hour period is approximately 1,268 (less than 1 time/minute);
- The maximum number of transmissions in a 24-hour period is approximately 25,916 (18 times/minute or about once every 3.3 seconds);
- Looking at the distribution of the field data gathered, only a small percentage of the meter population will transmit near the maximum value. In fact, 97 percent of the meters in this random sample transmitted less than 2,500 times in a 24-hour period.



- i. How many of those times (average and maximum) are to transmit electric usage information?

This will vary depending on business process, which will determine how read schedules are set up. Typically, there are two or three scheduled reads for usage data from each meter in a 24-hour period.

- ii. How many of those times (average and maximum) are for other purposes? What are those other purposes?

This will vary with business process, which will determine how read schedules are set up. Typically, there are two or three scheduled reads for purposes other than returning usage data from each meter in a 24-hour period. These are typically for doing a register read and/or events read. The balance of the transmissions are for network command and control: synchronization, security, data integrity and dynamic network resiliency.

- iii. What are the number of times (average and maximum) by type/category of transmission?

Detailed analysis of the type/category of transmissions has not been completed. One data point from the gathered field data is that, on average, the segmentation between meter data transmissions (scheduled and/or on-demand) and network command and control (synchronization, security, data integrity and dynamic network resiliency) is expected to be:

- Transmissions of meter data: 10%
- Transmissions for network command/control: 90%

i. Under what scenarios does each version of Your Smart Meter transmit outside of the daily schedule, i.e., transmissions such as on-demand reads, tamper/theft alerts, last gasps, firmware upgrades, etc.?

Duquesne Light cannot reasonably determine what information is sought by the "etc." abbreviation and provides the following information in response to the remaining portions of Discovery Request #1(i):

- **On-Demand Reads:** These reads are outside of the daily read cycle and will be fully dependent on business processes. Each On-Demand read will generate one downstream and one upstream packet with average transmission duration of 125mSec.
- **Tamper/Theft Alerts:** These alerts vary based on the environment of the deployment. Each event will generate a single upstream packet with average transmission duration of 18 mSec.
- **Last Gasp:** This will be highly dependent on the frequency and extent of the power outages in the coverage area. Each meter will send three last gasp messages when a power outage is detected with average transmission duration of 18 mSec.
- **Firmware Download:** Firmware downloads over the RFLAN are typically done once a year (reflecting major system releases). The firmware download process is a background activity for the network typically spanning from 12 hours to 12 days (depending on the number/type of firmware modules downloaded). Measurements at the Itron meter farm indicate the firmware download adds approximately 2% overhead to the network traffic. For example, a download of 347KB register firmware will take up to 8 days. On a 1G RFLAN system with 150 Byte packets, this results in:
 - $347,000 \text{ Bytes} / 150 \text{ Bytes/Pkt} = 2,313 \text{ Pkts}$
 - $2,313 \text{ Pkts} / 8 \text{ Days} = 289 \text{ Pkts/Day (12 Pkts/Hour)}$
 - Each packet represents one downstream broadcast transmission of approximately 150 mSec.
- **Network Synchronization:** The nature of an RF mesh network requires that meters maintain communications with their neighbor meters to ensure the stability, self-healing and integrity of the network. A good example of this is timing synchronization where meters send their neighbor meters time-synchronization packets at regular intervals to ensure all of the devices in the network are synchronized for time slot usage. Time-synchronization packets are sent approximately every 93 seconds with average transmission duration of 18 mSec.

j. Typically, how much of the communication between the customer's Smart Meter

- i. and other Smart Meters in the customer's area grid is unscheduled vs. scheduled?

See response to Discovery Request #1(h)(iii).

- ii. and You (Duquesne Light) is unscheduled vs scheduled?

The majority of the communications between the customer's meter and the utility is based on scheduled data requests (interval data read, register reads, events read, network statistics read). The amount of communication for on-demand reads and events will be highly dependent on business processes and the environment of the deployment (e.g., outage and tamper events). The network overhead does not represent communication between a meter and the utility (i.e., does not route back to the head end system). These overhead transmissions are required for the proper operation of the dynamic, self-healing RF mesh. The 53 seconds that an average OpenWay meter transmits in one day includes all of the communications described above.

k. Are there any other factors that go into determining duration and/or frequency of Your Smart Meter's transmissions (e.g., if a meter can't access the network when it's trying to send usage data, meter ID, etc.)? If yes, please identify these factors.

When meters first join a network, they go through a sequence of three discovery beaconing phases to find the network and appropriate neighbor devices to sponsor them on to the network. Each of the phases are described below:

- Phase 1 of Discovery: approximate 9 minute duration; 156 cycles of 1.04 seconds of beaconing (20ms beacon on each of 52 channels); followed by 2.5 seconds of listening (no transmissions).**
- Phase 2 of Discovery: approximate 55 minute duration; 99 cycles of 1.04 seconds of beaconing; followed by 32.5 seconds of listening.**
- Phase 3 of Discovery: Remaining time until it joins the network; continuous cycles of 1.04 seconds of beaconing; followed by 1 hour, 2.5 seconds of listening.**

Once on the network, the meter will behave as outlined above.

I. What is the amount of RF emission at the source of each version of Your Smart Meter when Your Smart Meter is transmitting data (instantaneous maximum peak level, averaged over 30 minutes)?

The limits for Maximum Permissible Exposure (MPE) established by the FCC account for a 20cm distance from the source to the measurement point. The RF emissions for the OpenWay meters deployed by Duquesne Light without this 20cm distance (at the antenna source) are:

900 MHz LAN Radio

- Transmitter Conducted Power: 28.38dBm, 688.65mW
- Antenna Gain: 2.2dBi
- Maximum System EIRP: 30.58dBm, 1142.88mW
- With 1 percent duty cycle over 30 minute interval: 1.143mW

2.4GHz Radio

- Transmitter Conducted Power: 18.13dBm, 65.01mW
- Antenna Gain: 3.8dBi
- Maximum System EIRP: 21.93dBm, 155.96mW
- With 1 percent duty cycle over 30 minute interval: 1.56mW

Note: The maximum observed duty cycle was 0.58%. This has been rounded up to 1 percent.

m. Does the amount of RF emission vary depending on duration of transmission/volume of data being sent? For example, are RF emissions higher when there is a larger volume of data to be transmitted?

No. The level of RF emissions (radiated power level) is fixed and the levels are shown in the response to Discovery Request #1(c). Only the duration of transmission will vary with the amount of data being sent.

n. Are there any other factors that impact the amount of RF emissions? If so, please identify the factor(s) and their impact on RF emissions.

The factors impacting RF emissions have been discussed above.

o. Is there RF emission when Your Smart Meter is not transmitting? If yes, what is the amount of RF emission?

Yes. All solid state electronic devices emit RF emissions due to processor clock signals and power supplies (such as televisions, DVD players, cell phones, computers and solid state meters). These types of unintentional emissions have limits set by the FCC in the Code of Federal Regulations, Title

47, Part 15 (47 CFR 15), Subpart B, Class B Devices. The smart meters being installed in Duquesne Light's service territory are tested and validated to be compliant with these FCC requirements.

p. Is there a difference in the amount of RF emissions for Your Smart Meter with the transceivers off and a Smart Meter with the transceivers removed and not present? If yes, what is that difference and how is it calculated?

No. When the radio is off, it does not transmit. The unintentional RF signals from the meter's solid state electronics will remain virtually unchanged with the radio turned off or removed.

q. Is there a difference in the amount of RF emissions for Your Smart Meter with the transceivers off and a traditional Analog Meter? If yes, what is that difference and how is it calculated?

Since smart meters are solid state electronic devices and Ferrous meters are electro-magnetic devices, their behavior is different and, to the best of Duquesne Light's knowledge, a comparison has therefore not been undertaken. Both devices, however, must comply with the same FCC regulations.

r. Since the SK9AMI7 is programmable, what control methods and capabilities do You have to change, adjust, or modify the Duty Cycle of the SK9AMI7 either directly or remotely?

The Duty Cycle of the Itron OpenWay meters has been established using a large population of deployed meters with a typical daily read schedule to ensure validity. This read schedule can be modified. Studies have not been undertaken to quantify the difference in Duty Cycle when the read schedule of the meters is modified. The expectation is that there will be minimal variance in the Duty Cycle with typical changes to read schedules.

s. What is the operational difference between Your standard residential Smart Meter and Your larger Collector Smart Meters?

Duquesne Light does not use a collector smart meter.

i. Is the customer informed that his/her residence/property has been chosen to house one of Your larger Collector Smart Meters, as opposed to Your standard residential Smart Meter?

See response to Discovery Request #1(s).

- ii. Is the customer given the option to refuse to house Your Collector Smart Meter?

See response to Discovery Request #1(s).

- t. Describe the function and operation of the Switch-Mode Power supply that supplies power to Your Smart Meter (the SK9AMI7?

The power supply is used to convert AC voltage to DC voltage to operate electronics in the meter. The HW 3.1 OpenWay Centron singlephase meter uses a capacitive switcher to drive a linear which then drives a buck convertor.

- i. How does the AC/DC switching circuitry draw power from the customer's line?

Power supplied to the meter to energize meter electronic circuits is drawn from the line side terminals (utility side) of the meter. Utility customers are not charged for the power consumed by the meter.

- ii. What voltage spiking, harmonics, additional loads and stresses does this introduce onto the customer's household interior electrical wiring?

Interior electrical wiring is the responsibility of the customer and/or homeowner and can vary by location. The smart meters being installed within Duquesne Light's service territories comply with the limits established by the FCC and have been validated by several outside laboratories, including UL.

- iii. In addition to the customer's electrical usage, is the customer being charged for the additional power used to operate Your Smart Meter?

No.

- u. Do you provide the customer/homeowner with the option to disable the 2.4GHz Zigbee Transceiver?

No.

2. Produce all Documents, including but not limited to studies, that relate to Your answer to Discovery Request No. 1.

The following documents are attached:

- **FCC RF Exposure Report for SK9AMI7**
- **OpenWay Wireless Transmissions 24 Hour Duty Cycle**
- **AMI7 EMC Report**
- **Duquesne Light's Final Smart Meter Plan - dated June 29, 2012**
- **Duquesne Light's Petition for Approval of Settlement - dated December 7, 2012**
- **Opinion and Order of the Pennsylvania Public Utility Commission - entered May 6, 2013**

- Petition of Duquesne Light Company to Modify its Smart Meter Plan - dated August 4, 2015
- Initial Decision of Administrative Law Judge Katrina Dunderdale - dated October 31, 2016
- Opinion and Order of the Pennsylvania Public Utility Commission on Duquesne Light's Petition for Approval to Modify its Smart Meter Plan - entered April 7, 2017
- Duquesne Light's Responses to Interrogatories of the Office of Consumer Advocate - Set III
- An Investigation of Radiofrequency Fields Associated with the Itron Smart Meter
- Application for Approval of Duquesne Light's Assessment of Needs, Technology Solutions and Vendor Selection
- Smart Meter Q&A
- Understanding Radiofrequency and Your New Meter
- Myths vs. Facts: The Truth About Smart Meters
- Data Privacy and Your New Meter
- Duquesne Light's Privacy Policy
- UL Online Certification Directory.

3. State all facts that support Your claim that Duquesne Light's installation of a Smart Meter at the Property will not negatively affect the health and/or medical condition(s) of Michele Hriadil, Francis Hriadil, and/or any pets or animals, and/or any visitors including but not limited to the elderly, children, babies, pregnant mothers and their fetuses, etc.

Duquesne Light is required by law to install smart meters throughout its service territory, which includes Complainants' home. The company's smart meter procurement and implementation plan has been approved by the Pennsylvania Public Utility Commission, which is prima facie evidence that it is safe, reasonable, and in compliance with the law. Furthermore, the smart meters being installed in Duquesne Light's service territory meters are compliant with the applicable FCC regulations for both intentional and unintentional radiation. See also the documents being produced in connection with Duquesne Light's discovery responses. Duquesne Light cannot reasonably determine what information is sought by the "etc." abbreviation and relies on its responses set forth above and below.

a. What analyses, if any, did You carry out to ensure that the Radiofrequency (RF) radiation, and Low Frequency (LF) radiation induced by the Switch-Mode Power supply, from Your wireless Smart Meter system would be safe for all of Your customers, and those living at or visiting their Property?

See response to Discovery Request #3.

i. If You did not carry out any analyses, how then did You

establish that Your wireless Smart Meter system is safe for all of Your customers, and those living at or visiting their Property?

See the response to the preceding Discovery Request.

b. Did your analysis/assessment consider the Radiofrequency (RF) radiation from a single wireless Smart Meter, or the radiation from all components of Your wireless Smart Meter system including

- i. all wireless Smart Meters in a community?
- ii. all intermediate wireless relay devices in a community such as any wireless Collector Smart Meters and Repeaters?
- iii. all wireless Transmitters/Receivers required to communicate between the intermediate wireless relay devices and Duquesne Light or its agents?

As required by the FCC, Itron assessed all of the active radios within the device. As with any other FCC-compliant device, Duquesne Light is not responsible for deployment of other devices in proximity of the meters. Itron has published a white paper that specifically addresses the levels of RF exposure from meter banks: "The Facts on RF Exposure from Meter Banks." A key factor highlighted in this paper is that the RF levels fall off very quickly over distance. This results in minimal additive levels of RF exposure from multiple devices in a given area.

c. Recognizing that the science indicates there are many conditions that can affect and influence Radiofrequency radiation levels in the home environment, does Your installation account for:

Before responding to each individual request below, Duquesne Light notes that this request is not only argumentative, but also overly broad with respect to what it contends that "science" indicates. Furthermore, Duquesne Light exercises responsibility for its equipment, but customers and/or homeowners are responsible for the internal circuitry and appliances that are located within a particular structure.

- i. uncertainties about the existing RF environment that exist at a location, such as how much RF exposure already exists at a location?

No.

- ii. what kind of reflective and re-radiation interior and exterior environments exist at a location? (It is established science that

reflections and re-radiation can come from common building materials ((tile, concrete, stainless steel, glass, ceramics)) and highly reflective appliances and furnishings that are common in kitchens, etc.)

No.

iii. how interior and exterior space is utilized near walls where the Smart Meters are mounted?

No.

iv. the specific physical condition(s) of the residents, and all likely visitors to the residence, including but not limited to age, medical condition(s), disabilities, medical implants, relative health, reliance on critical care equipment that may be subject to electronic interference, etc.?

No.

v. the location of Your Smart Meter on the residence in close proximity to, or in co-location with, other Smart Meters on the same building, such as with connected condominiums (like the Complainant's Property), apartment buildings, etc.?

No.

vi. unrestrained access to areas of the Property where Your Smart Meter(s) are located?

This request is so vague that Duquesne Light cannot reasonably be expected to form a complete response. See Duquesne Light's response to the preceding Discovery Requests.

d. What if anything is taken into account concerning the installation of Your Smart Meter?

This request is so vague that Duquesne Light cannot be reasonably expected to form a complete response, but Duquesne Light considers safety, reliability, and efficiency when installing smart meters throughout its service territory.

e. Are customers/homeowners provided with any written notice of the dangers and inherent risks associated with being in close proximity to Your Smart Meter on a regular

basis?

This request is argumentative and Duquesne Light disagrees with the premise of this request, which is that there is a danger and/or inherent risk of being in some undefined "close proximity" to the smart meters being installed throughout its service territory.

- i. Is a safety barrier provided to ensure and maintain the required safe separation distance for all persons, children, animals, etc?

No.

- ii. Are there warning labels on Your Smart Meters?

The Smart Meter contains a standard message that warns against introducing currents at voltages above the meter's design tolerance.

- f. As a responsible corporate resident of the state of Pennsylvania, concerned with providing adequate, efficient, safe, and reasonable service for the accommodation, convenience, and safety of its patrons, to what extent are You aware of and acknowledge the numerous reports, statements, and warnings by respected and prestigious organizations such the World Health Organization (WHO), the National Institutes of Health (NIH), the National Toxicology Program (NTP), the American Cancer Society (ACS), the American Academy of Pediatrics (AAP), the American Academy of Environmental Medicine (AAEM), etc., as well as numerous experts in the medical and technology fields, with regard to the exposure of Your customers to regular and frequent pulsed Radiofrequency (RF) radiation and Low Frequency (LF) radiation from Your Smart Meter system?

This request does not refer to any specific documents and is so vague that Duquesne Light cannot be reasonably expected to form a complete response, but Duquesne Light is generally aware that various entities have produced publications relating to RF and LF.

4. Produce all Documents, including but not limited to studies, that relate to Your answer to Discovery Request No. 3.

The following documents are attached:

- **RF Safety Compliance of OpenWay Smart Meters and the CG-Mesh IPv6 Network**

- The Facts on RF Meter Banks.

5. Do You stand behind and guarantee Your claim that "Your wireless Smart Meter system is harmless"? If so, will You provide a written warranty to that effect indicating that You are accountable and will accept all liability for all health and medical consequences that occur as a result of Your wireless Smart Meter system?

This request is vague, ambiguous, and lacks a factual foundation as it does not indicate how or when Duquesne Light made the alleged statement in question. Duquesne Light reiterates that it is required by law to install smart meters throughout its service territory, which includes Complainants' home. The company's smart meter procurement and implementation plan has been approved by the Pennsylvania Public Utility Commission, which is prima facie evidence that it is safe, reasonable, and in compliance with the law. Duquesne Light's alleged liability for any acts or omissions will be adjudicated through the appropriate legal proceedings based on the facts of each case.

6. To the extent not articulated in Your response to the preceding requests, state all facts that support Your claim that Duquesne Light's installation of a Smart Meter at the Property does/will not pose a reliability, safety, or quality problem.

See response to Discovery Request #5.

a. What are the physical elements, components, and materials used in the construction of Your electrical Smart Meter? Electronic components? Circuit boards? Flammable materials?

The terms used in this request are vague. Duquesne Light offers the following table, which lists the common material used in the HW 3.1 OpenWay CENTRON meter:

CEN-II	
Component	Material
Base and Switch Cover	PETRYNITE FR 515
Utility Cover, Meter Covers, Clamps	Polycarbonate
Support and Expansion Hardware	Stainless Steel
Terminal Block, Terminals, Screws, Washers	Stainless Steel
Wiring and Cables	Copper
Internal and External Antennas	Aluminum
Internal and External Enclosures	Aluminum

b. In the United States, Authorities Having Jurisdiction (AHJs) assert that certification of electrical equipment is necessary and that Underwriters Laboratories is the preferred safety certification organization. Does a UL Mark appear on Your Smart Meter?

No, but the HW 3.1 OpenWay CENTRON singlephase was UL 2735 tested and approved on May 30, 2015.

c. Can overheating of the electronic components and flammable materials inside of Your Smart Meters cause the components to degrade, expand, "pop", smoke, burst into flame, burn, and/or explode, with a single occurrence or repeatedly over time?

Duquesne Light cannot and will not speculate as to what might happen to the components of a smart meter based on a vague and unidentified set of facts. As noted by the responses to the preceding Discovery Requests, the smart meters being installed in Duquesne Light's service territory fall within the limits established by the FCC, have been tested and approved by UL, and the company's smart meter procurement and implementation plan has been approved by the Pennsylvania Public Utility Commission, which is prima facie evidence that it is reasonable, safe, and in compliance with the law.

d. Does Your Smart Meter contain anything to warn the homeowner of overheating, fire danger, or explosion?

The Smart Meter contains a standard message that warns against introducing currents at voltages above the meter's design tolerance.

e. Has destructive testing been carried out on Your Smart Meter?

This question is so vague that Duquesne Light cannot reasonably be expected to form a complete response.

i. If so, what were/are the failure modes/mechanisms? What were/are the occurrences of overheating, smoking, burning, popping, and explosions when the Smart Meter components are overstressed?

See response to Discovery Request #6(e) above.

- li If not, how do you know what the failure modes of Your Smart Meters are, and how do you know they are safe?

See response to Discovery Request #6(e) above.

- f. Does Your Smart Meter provide Circuit Breaker protection for the homeowner?

No. Protection of the internal electrical circuitry and appliances are the responsibility of the customer and/or homeowner. See section 13 of Duquesne Light's tariff and the associated electric service installation rules, both of which are being produced.

- g. Does Your Smart Meter provide Surge Arrestors designed to withstand and protect the homeowner's internal electrical system and connected appliances from large voltage surges and other events originating on the utility-side electrical grid?

See response to Discovery Request #6(f).

- h. How does Your Smart Meter compare with the innate ability of the traditional strictly Analog Meter to protect the homeowner from large voltage surges and other events originating on the utility-side electrical grid?

This request is so vague that Duquesne Light cannot reasonably be expected to form a complete response, but Duquesne Light uses industry-standard protective devices throughout its electric circuits, such as breakers, protective relays, and reclosers. Protection of the internal electrical circuitry and appliances are the responsibility of the customer and/or homeowner. See response to Discovery Request #6(f).

- i. What measures exist in Your Smart Meters to assure safe and reliable operation, and prevent degradation over time, due to power surges and environmental factors such as debris, humidity, vibration, salt water, etc. which can lead to the occurrence of "hot sockets" that is superior to the traditional strictly Analog Meter?

This request is so vague that Duquesne Light cannot be reasonably expected to form a response, but the HW 3.1 OpenWay CENTRON singlephase meters are ANSI C12.1, ANSI C12.20 and UL2735 compliant devices. Furthermore, the meters operate within the limits established by the FCC and the company's smart meter implementation and procurement plan has been approved by the Pennsylvania Public Utility Commission, which is prima facie evidence that it is reasonable, safe, and in compliance

with the law. Furthermore, the meters themselves do not lead to the occurrence of hot socket conditions. Hot Socket conditions are caused by external influences. External influences that can contribute to hot socket conditions are loose or open meter socket jaws, corrosion of meter socket jaws, contamination of meter socket jaws, and faulty wiring of meter socket. Precautions against, and repair of, such conditions is the responsibility of the customer.

j. To what degree is Your Smart Meter susceptible to damage from "hot sockets" as compared with the traditional strictly Analog Meter?

This request is so vague that Duquesne Light cannot be reasonably expected to form a complete response, but see the response to the preceding Discovery Request.

k. What risks and responsibilities do You assume, and what risks and responsibilities does the homeowner assume, once Your Smart Meter is installed on their residence, as many insurance companies will not cover fires related to Smart Meter failures?

This request is so vague that Duquesne Light cannot be reasonably expected to form a complete response. Duquesne Light's responsibilities are set by the applicable law and by its tariff. Duquesne Light has no knowledge relating to the availability of coverage under individual homeowner insurance policies.

i. Do You assume any responsibility for damage done to the customer's/homeowner's electrical wiring, electrical appliance, utility meter box, building structure, etc. due to voltage surges or other events originating on the utility side electrical grid?

This request is so vague that Duquesne Light cannot be reasonably expected to form a complete response. Duquesne Light's responsibilities are set by the applicable law and by its tariff.

ii. Are customers/homeowners informed of these risks and responsibilities?

This request is so vague that Duquesne Light cannot be reasonably expected to form a complete response. Duquesne Light's tariff is publicly available.

l. Thousands of fires have been documented in PA, CA, TX, FL, NV, IL, and across Canada in buildings after the installation of Smart Meters, including Your Smart Meter (the SK9AMI7). Property has been damaged, and there have been injuries and fatalities. Causes have been attributed to power/voltage surges, overheating, and old building wiring. To what extent are You aware of and acknowledge these occurrences, and what specific measures have you instituted to ensure the safety of your customers?

This request is so vague and overly broad that Duquesne Light cannot be reasonably expected to form a complete response. Furthermore, as noted above, the smart meters being installed in Duquesne Light's service territory are within the limits established by the FCC, have been tested and approved by UL, and comply with ANSI standards. Furthermore, the meters operate within the limits established by the FCC and the company's smart meter implementation and procurement plan has been approved by the Pennsylvania Public Utility Commission, which is prima facie evidence that it is reasonable, safe, and in compliance with the law.

m. How many SK9AMI7 Smart Meters have been removed or recalled from the field for reasons of quality, safety, and reliability?

This request is so vague that Duquesne Light cannot be reasonably expected to form a complete response. Furthermore, as noted above, the smart meters being installed in Duquesne Light's service territory are within the limits established by the FCC, have been tested and approved by UL, and comply with ANSI standards. Furthermore, the meters operate within the limits established by the FCC and the company's smart meter implementation and procurement plan has been approved by the Pennsylvania Public Utility Commission, which is prima facie evidence that it is reasonable, safe, and in compliance with the law.

7. To the extent they have not been previously requested or produced, produce all Documents that relate to Your response to Discovery Request No. 6.

The following documents are attached:

- Notice of Completion and Authorization to Apply the UL Mark
- Paragraph #13 of Duquesne Light's Tariff
- Duquesne Light's Electric Service Installation Rate Rules
- Additional documents have already been provided in responses to Discovery Request #2 and Discovery Request #4.

8. Do You stand behind and guarantee Your claim that "Your wireless Smart Meter system is safe and reliable"? If so, will You provide a written warranty to that effect indicating that You are accountable and will accept all liability for any and all property damage and personal harm, etc. that occurs as a result of Your wireless Smart Meter system?

See response to Discovery Request #5.

9. State all facts that support Your claim that Duquesne Light's manner of installing its Smart Meters is safe.

Duquesne Light reiterates that it is required by law to install smart meters throughout its service territory, which includes Complainants' home. The company's smart meter procurement and implementation plan has been approved by the Pennsylvania Public Utility Commission, which is prima facie evidence that it is safe, reasonable, and in compliance with the law. See Duquesne Light's responses to the ensuing Discovery Requests.

a. Installations are not being carried out by Duquesne Light certified electricians. Duquesne Light has subcontracted its Smart Meter installation out to contractors who deploy installer technicians with varying degrees of training and expertise, such as Wellington Power Corporation.

This request does not contain a question that requires a response from Duquesne Light.

- i. How much education, experience, and what specific training do the installer technicians subcontracted by Duquesne Light have, and what, if any, are their certifications?

This interrogatory is so vague and broad that Duquesne Light cannot reasonably be expected to form a response. Duquesne Light cannot be reasonably expected to identify the education, experience, and specific training of each individual subcontractor technician. Notwithstanding the vagueness and broadness of this interrogatory, Duquesne Light provides the following response:

All Wellington Power Corporation field personnel exchanging meters in Duquesne Light's service territory are IBEW union members and have been required to pass a written test as well as a two-week field evaluation. It is Duquesne Light's belief that such evaluation is consistent with industry best practices.

- ii. What quality control measures are in place to ensure that their

education and training is sufficient and properly maintained, and that the proper installation protocols are being followed?

Wellington Power Corporation supervisors audit 100 percent of new field technicians' meter installations during their first two weeks of field work. Thereafter, supervisors conduct spot audits of 3 percent of installations. It is Duquesne Light's belief that such auditing procedure is consistent with industry best practices.

b. The installation of Your Smart Meters has been directly witnessed and observed by many, including myself. The focus is on speed of deployment in a neighborhood (deploying as many devices as possible in the shortest time), not safety. The meters are just simply and quickly changed out in what is called a "hot install."

This request does not contain a question that requires a response from Duquesne Light, but Duquesne Light disagrees that it emphasizes speed over safety.

i. What is Duquesne Light's specific installation protocol and procedure that is followed to ensure the safety of its customers/homeowners?

Prior to pulling a meter, Duquesne Lights instructs its employees to look for obvious signs of deterioration such as excessive corrosion, a sunken or detached underground service entrance cable, or a socket visibly detached from the customer's house. After a meter is pulled and the employee can see behind the meter, the company instructs them to inspect various componentry inside the socket for signs of deterioration. This includes the insulators, the jaws, the connections, and the wiring. The employee is also instructed to verify service voltage. If the design of the socket permits, the employee will apply bypass jumpers prior to removing the meter to prevent the customer from losing power during the exchange.

ii. What measures has Duquesne Light instituted to make sure that this protocol and procedure are being properly and consistently followed in the field?

To ensure employees are adhering to procedures, Duquesne Light's supervisors take an active approach in conducting field safety audits.

iii. Does Duquesne Light condone and authorize the use of a "hot install"?

The term "hot install" is undefined, thereby making it difficult for Duquesne Light to provide a complete response to this Discovery Request. Where it can be done safely, Duquesne Light does exchange meters without interrupting electric service to the customer.

iv. How does Duquesne Light protect its customers/homeowners and their property from the potential of "electric flash, arcing, or sparking" upon a "hot install"?

The term "hot install" is undefined, thereby making it difficult for Duquesne Light to provide a complete response to this Discovery Request. Duquesne Light and its installation contractors do not attempt meter exchanges under conditions they deem to pose a safety hazard. As part of the smart meter exchange process, Duquesne Light or its installation contractors contact residential customers prior to the exchange, in part to provide the customers with an opportunity to advise the company of any conditions that would impede a meter exchange or if the customer would prefer to shut down operating equipment during the meter exchange. At the time of the exchange, if the installation technician identifies a condition that would make it unsafe to conduct the exchange (e.g., a socket abnormality), he or she stops the exchange and notifies Duquesne Light. Duquesne Light then sends an experienced meter technician to remedy the condition and/or notify the customer of required repairs or service corrections. As part of the installation process the meter exchanger is to attempt to notify the customer prior to meter exchange in the event the customer would prefer to shutdown operating equipment. If the installer identifies a socket abnormality during install, they would stop exchange and notify Duquesne Light to send a meter specialist to make repairs or notify customer of potential service corrections needed.

c. Are the customer's/homeowner's neutral connections considered and checked by a certified electrician for damage or corrosion prior to installation?

Duquesne Light does not consult certified electricians prior to the meter exchange. If an installing technician identifies an abnormality with the customer's neutral connections as part of his/her visual inspection, he/she would stop the installation. By way of further response, see the response to Discovery Request #9(b)(iv).

d. If so, how is this inspection done and what does it involve? Are the age and condition of the customer's/homeowner's electrical system, wiring, and meter box bases considered and checked by a certified electrician prior to installation of Your Smart Meter to ensure that the sockets and house wiring is compatible with the installation of your Smart

Meter?

Duquesne Light does not consult certified electricians prior to the meter exchange. By way of further response, see the response to Discovery Request #9(c).

- i. If so, how is this inspection done and what does it involve?

Duquesne Light objects to this Discovery Request because it is vague. By way of further response, Duquesne Light states that it does not consult certified electricians prior to conducting a meter exchange.

- ii. How many residences have failed this inspection?

Through the course of the project, Wellington Energy has forwarded investigations at a rate of 0.5 percent consistently for Duquesne Light Specialist. In this 0.5 percent would be potential neutral connection concerns.

- iii. What are the observed frequencies and occurrences of
- aa. damage or melting around the meter tabs/blades?
 - bb. pitting in the socket jaws?
 - cc. loss of spring tension in the socket jaws?
 - dd. oxidation on the lug wires?
 - ee. evidence of arcing?
 - ff. sockets that are unsafe or not up to code?
 - gg. other abnormal conditions?

The 0.5 percent investigation referenced in the response to Discovery Request #9(d)(ii) above includes the conditions stated in Discovery Request #9(d)(iii)(aa)-(gg).

- iv. What other safety related issues have been observed?

Duquesne Light does not specifically itemize the socket conditions.

- v. How has Duquesne Light addressed these safety related issues when they occurred?

A Duquesne Light meter specialist will make repairs or notify the customer of potential service corrections needed.

- e. What testing for "hot sockets" is performed during the installation of Your

Smart Meter?

Duquesne Light and Wellington Energy, Inc perform the checks for the conditions mentioned previously in Discovery Request #9 that lead to "hot sockets."

f. Is the electric power to the residence turned off at the utility pole, etc. during the installation of Your Smart Meter to protect the customer's/homeowner's electrical system and appliances from damage due to the installation process? If not, why not?

Electric service to the residence is typically not turned off during a meter exchange because under most conditions such service interruption is not required to ensure that the exchange will not pose a safety risk to customer, customer property, or the installation technician.

g. Is the general protocol that the installation is carried out irrespective of the condition of the residence and its electrical system? If not, how not?

This request is so vague that Duquesne Light cannot be reasonably expected to form a complete response, but, as noted above, the internal electrical circuitry is the responsibility of the customer and/or homeowner. By way of further response, if the installer identifies a socket abnormality during install they would stop exchange and notify Duquesne Light to send an experienced meter technician to make repairs or notify the customer of potential service corrections needed.

10. Produce all Documents that relate to Your response to Discovery Request No. 9.

The following documents are attached:

- **Advanced Meter Exchange Procedure**
- **Verify Service Voltage & Perform Safety Check Procedure**

11. Do You stand behind and guarantee Your claim that "Your manner of installing Your Smart Meters is safe"? If so, will You provide a written warranty to that effect indicating that You are accountable and will accept all liability for any and all property damage and personal harm, etc. that occurs as a result of the installation of Your wireless Smart Meter?

See response to Discovery Request #5.

12. State all facts that support Your claim that Duquesne Light's installation of a Smart Meter at the Property is reliable and secure.

See Duquesne Light's responses to the preceding Discovery Requests.

a. With everyone from individuals in the home to secure government installations being the targets of ongoing cyber attacks, that are routinely reported in the press, by law enforcement, and in trade journals, which have resulted in the loss of "secure" identity, medical, financial, etc. information, incurring, at times, massive and devastating personal, financial, business, etc. damage and loss, and in which experts in the security field such as Former CIA Director James Woolsey have repeatedly issued dire warnings, what justification can You provide that Your security protocols for Your Smart Meter system are effective, are any different, and any better than the best security systems in the country which have already been breached?

This request is so broad and vague that Duquesne Light cannot be reasonably expected to form a complete response. Duquesne Light reiterates the company's smart meter procurement and implementation plan has been approved by the Pennsylvania Public Utility Commission, which is prima facie evidence that it is safe, reasonable, and in compliance with the law. Duquesne Light incorporates its response to the preceding requests as if fully restated.

b. How is the security of our personal information, of the electricity to our Property, of the electrical infrastructure of the state of Pennsylvania not made significantly more vulnerable by the deployment and proliferation of hundreds of thousands to millions of wireless programmable end-metering devices, such as Your Smart Meters, and Your Collector Meters, Your Repeaters, Your Data Storage Centers, etc, which are effectively hundreds of thousands to millions of open portals into the electrical energy infrastructure of the state?

This request is argumentative and Duquesne Light rejects its premise. The smart meters being installed in its service territory are not "open portals into the electrical energy infrastructure of the state."

c. Has the delivery of electricity to any of Your customers been unintentionally interrupted by a shutdown switch

i. that You did not trigger with a wireless signal?

Upon information and belief, no.

ii. that You triggered accidentally with a wireless signal

Under both Duquesne Light's Smart Meter system and its legacy metering system, it is possible that a customer's electric service could be mistakenly disconnected due to human error. Duquesne Light does not believe that its Smart Meter system is more vulnerable than its legacy metering system to such error. Duquesne Light is not aware of any instances in which a customer's service was erroneously disconnected due to a technical error of its Smart Meter wireless communications equipment.

d. Have there been any attempts at cyber hacking of Your wireless Smart Meter system?

Upon information and belief, no.

- i. If yes, what were the nature and outcome of these attempts?
- ii. If yes, have You incurred any costs as a result of such hacking
 - aa. from lost revenue?
 - bb. in identifying the specific cyber vulnerability that enabled the hacking?
 - cc. for software or hardware revisions to correct the cyber vulnerability?
 - dd. for replacing, recalling, or modifying Your Smart Meters?
- iii. if You have incurred costs as a result of hacking, were those costs passed on to Your customers?

12. 13. Produce all Documents that relate to Your response to Discovery Request No.

None.

14. Do You stand behind and guarantee Your claim that "Your Smart Meter system is secure"? If so, will You provide a written warranty to that effect indicating that You are accountable and will accept all liability for any and all Property damage and personal harm, etc. that occurs as a result of the hacking, breach, or abuse of Your Smart Meter security system?

See response to Discovery Request #5.

15. Given the controversial nature of wireless Smart Meter deployment, and the increasing negative reports and warnings appearing in the press, and in medical and trade

publications, state the facts indicating that the installation of Your Smart Meter will not have a negative impact on the value of our Property?

This request is argumentative and Duquesne Light disagrees with its premise. Furthermore, Duquesne Light reiterates that it is required by law to install smart meters throughout its service territory, which includes Complainants' home, and the company's smart meter procurement and implementation plan has been approved by the Pennsylvania Public Utility Commission, which is prima facie evidence that it is safe, reasonable, and in compliance with the law. See also Duquesne Light's response to the preceding Discovery Requests.

15. 16. Produce all Documents that relate to Your response to Discovery Request No.

None.

17. Do You stand behind and guarantee Your claim that "Your Smart Meter system will not negatively affect the value of our Property"? If so, will You provide a written warranty to that effect indicating that You are accountable and will accept all liability for any loss in value of our Property that occurs as a result of the installation of Your Smart Meter system?

See response to Discovery Request #5.

18. What is the nature and specificity of the customer data being collected by Your Smart Meter system, and how do You intend/ plan to use that customer data?

Duquesne Light's residential Smart Meters collect hourly and daily electric consumption data for the purposes of billing customers. Smart Meters also collect the following data used for utility grid operations: demand resets; meter tampering events; battery voltage; power outage or restoration events; and voltage thresholds.

a. Will this personal data only be used for billing purposes internal to Duquesne Light?

No. As discussed in the response to the preceding request, some data collected by Smart Meters will be used to facilitate grid operations.

b. What protections are in place to ensure the privacy of this personal data?

Duquesne Light takes data security very seriously. The company has a centralized Chief Information Security Officer and dedicated staff responsible for providing cybersecurity operations, risk management and governance for the protection of Duquesne Light assets and information. Duquesne Light takes a measured defense-in-depth approach by deploying security controls to achieve and maintain a reliable and resilient infrastructure designed to protect

customer data and system operations. Duquesne Light's defense-in-depth approach provides the ability to withstand, respond and adapt to the changing cybersecurity threat landscape. Duquesne Light uses a diverse set of tools and techniques to secure our systems and data. Duquesne Light employs security controls including end-point protection systems, advanced malware protection systems, network security segmentation, intrusion detection/prevention systems, security incident and event monitoring, threat intelligence and vulnerability management as well as recovery and response measures. With respect to Duquesne Light's Smart Meter system: the system uses advanced and open standard data encryption and authentication techniques that have been approved internationally by bodies such as the National Institute of Standards and Technology and the National Security Agency.

c. If this personal data is to be used for other than billing purposes, what are those purposes, and will this be done only with the knowledge and written consent of the customer/homeowner?

The Pennsylvania Public Utility Commission requires Duquesne Light to provide an Eligible Customer List (ECL), comprising certain customer information, to qualified electric generation suppliers (EGSs). Customers can opt to be removed from the ECL. ECL requirements predate, and are not associated with, Duquesne Light's Smart Meter system. For more information about the ECL, visit the Public Utility Commission's website at:

http://www.puc.state.pa.us/utility_industry/electricity/electric_competitive_market_oversight.aspx.

d. Will this personal data be used to monitor and/or profile the customer/homeowner?

To an extent, yes. The primary purpose and function of an electric meter (including both Duquesne Light's legacy meters and its Smart Meters) is to monitor the customer's electric consumption.

e. Have You received any requests for this personal data from any individual, company, or organization for the purposes of profiling, data-mining, etc.?

Upon information and belief, Duquesne Light has received one request from an external party for customer interval usage data for the purposes of developing customer profiles. Duquesne Light received this request in 2013 and denied it. DLC does not provide customer data to unauthorized parties.

f. Have You offered this personal data to any individual, company, or organization?

Except for required disclosures as identified in response to Discovery Request #18(c), above, and information disclosed as part of regulatory reporting,

discovery in legal proceedings, or in response to competent order of a court or law enforcement entity, no.

g. Have You sold this personal information to any individual, company, or organization?

No.

h. Do You have plans in the future to market this personal data in any way for the purposes of creating new income streams?

No.

19. Produce all Documents that relate to Your response to Discovery Request No. 18.

The following documents are attached:

- **Email from to Kevin Baden dated April 29, 2013 requesting customer data.**

20. Do You stand behind and guarantee Your claim that "our personal data collected by Your Smart Meter system will remain secure and private within Duquesne Light"? If so, will You provide a written warranty to that effect indicating that You are accountable and will accept all liability for any loss, abuse, or misuse of our personal data, and any use of our personal information for other than billing purposes without our knowledge and written consent, that is collected and stored by Your Smart Meter system?

See response to Discovery Request #5.

21. How many incidents have occurred, and how many customers have filed concerns and complaints with Duquesne Light, concerning Your Smart Meters with regards to, but not limited to,

- health?
- safety, reliability, and fires?
- privacy?
- security?
- electrical and device interference?
- increased and increasing electrical bills, and over-billing charges?

What were the specifics of these incidents or complaints?

This request is so vague and broad that Duquesne Light cannot be reasonably expected to form a complete response, but copies of all complaints filed with the Pennsylvania Public Utility Commission are publicly available. The mere fact that a complaint was filed does not in any way suggest that Duquesne Light acted improperly or violated the law.

22. Has Duquesne Light provided any relief or accommodation from their Smart Meter system to any individual, official, group, community, organization, etc. for any reason at any time?

The term "relief or accommodation from their Smart Meter system" is so vague that Duquesne Light cannot be reasonably expected to form a complete response. Duquesne Light reiterates that it is required by law to install smart meters throughout its service territory, and that the applicable laws do not provide for individual customers to "opt out" of having a Smart Meter installed at their premises.

a. If so, list those individuals, officials, groups, communities, organizations, etc., and the reasons for that relief or those accommodations?

23. To the extent not previously requested or produced, produce all Documents that You intend to offer into evidence at any hearing in this matter.

Duquesne Light has not yet made a final determination regarding the documents it will offer as hearing exhibits.

24. State the full name, title, affiliation, address, and telephone number of each person who You expect to call to testify at any hearing of this matter.

Duquesne Light has not yet made a final determination as to who it will call to testify at a hearing in this matter.

25. State the full name, title, affiliation, address, and telephone number of each person who You expect to call to testify as an expert witness at any hearing of this matter and, for each expert witness, state:

- a. The subject matter on which the expert is expected to testify;
- b. The substance of the facts and opinions to which the expert is expected to testify; and
- c. A summary of the grounds for each expert opinion.

Duquesne Light has not yet determined what expert witnesses, if any, it will call to testify at a hearing in this matter.

26. Produce the report of any expert You intend to call to testify on Your behalf at trial.

See response to Discovery Request #25.

27. Produce the curriculum vitae of any expert that You intend to call to testify on your behalf at trial.

See response to Discovery Request #25.

TUCKER ARENSBERG, P.C.

By: 
Jeremy V. Farrell, Esquire
PA. ID. No. 316258
Paul Shane Miller, Esquire
PA. ID. No. 319174
1500 One PPG Place
Pittsburgh PA 15222
(412) 566-1212

Counsel for Respondent,
Duquesne Light Company

LIT:631910-1 014657-158498

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing Respondent's Responses to Set #1 of Discovery Requests was served by First-Class, U.S. Mail, postage prepaid, this 20th day of November, 2017 upon the following:

Michele Hriadil and Francis Hriadil
331 Shady Ridge Drive
Monroeville, PA 15146



Jeremy V. Farrell, Esquire
PA. ID. No. 316258
Paul Shane Miller, Esquire
PA. ID. No. 319174
1500 One PPG Place
Pittsburgh PA 15222
(412) 566-1212

Counsel for Respondent,
Duquesne Light Company

LIT:631910-1 014657-158498

Appendix Tab 5

PENNSYLVANIA PUBLIC UTILITY COMMISSION

Formal Complaint

*Filing this form begins a legal proceeding and you will be a party to the case.
If you do not wish to be a party to the case, consider filing an informal complaint.*

To complete this form, please type or print legibly in ink.

1. Customer (Complainant) Information

Provide your name, mailing address, county, telephone number(s), e-mail address and utility account number. It is your responsibility to update the Commission with any changes to your address and to where you want documents mailed to you.

Name Michele Hriadil, Francis Hriadil

Street/P.O. Box 331 Shady Ridge Drive Apt #

City Monroeville State PA Zip 15146-7510

County Allegheny

Telephone Number(s) Where We Can Contact You During the Day:

(412) 824-5453 (home) (412) 779-3314 (mobile)

E-mail Address (optional): hriadil@attglobal.net

Utility Account Number (from your bill) 406745000

If your complaint involves utility service provided to a different address or in a different name than your mailing address, please list this information below.

Name n/a

Street/P.O. Box

City State Zip

RECEIVED

OCT 3 2015

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

2. Name of Utility or Company (Respondent)

Provide the full name of the utility or company about which you are complaining. The name of your utility or company is on your bill.

Duquesne Light Company

3. Type of Utility Service

Check the box listing the type of utility service that is the subject of your complaint (check only one):

☒ ELECTRIC	☐ WASTEWATER/SEWER
☐ GAS	☐ TELEPHONE/TELECOMMUNICATIONS (local, long distance)
☐ WATER	☐ MOTOR CARRIER (e.g. taxi, moving company, limousine)
☐ STEAM HEAT	

4. Reason for Complaint

What kind of problem are you having with the utility or company? Check all boxes below that apply and state the reason for your complaint. Explain specifically what you believe the utility or company has done wrong. Provide relevant details including dates, times and places and any other information that may be important. If the complaint is about billing, tell us the amount you believe is not correct. Use additional paper if you need more space. **Your complaint may be dismissed without a hearing if you do not provide specific information.**

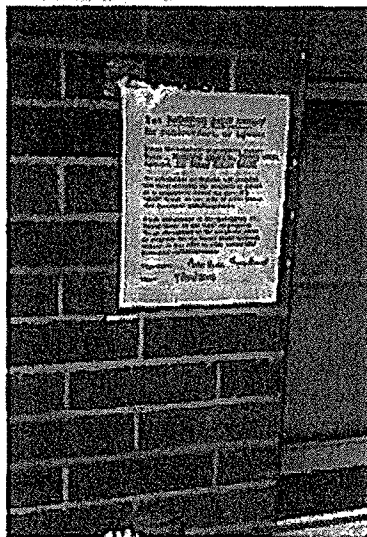
- ☐ The utility is threatening to shut off my service or has already shut off my service.
- ☐ I would like a payment agreement.
- ☐ Incorrect charges are on my bill. Provide dates that are important and an explanation about any amounts or charges that you believe are not correct. Attach a copy of the bill(s) in question if you have it/them.
- ☒ I am having a reliability, safety or quality problem with my utility service. Explain the problem, including dates, times or places and any other relevant details that may be important.
- ☒ Other (explain).

4. Reason for Complaint

9/24/2016. We received a recorded phone message on our answering machine, while we were out, that Duquesne Light was intending to install a Smart Digital Meter in the next 3 - 5 business days. We did not hear that message until late on Saturday, and we could not call anyone back. This was very short, last minute, notice, and we had little time to respond.

9/27/2016. I searched online and found that Campbell Hawkins was the Vice President of Customer Care. We composed a message indicating our deep concern about this new technology and our objection to having it replace our reliable, safe, and fully function analog meter, which we immediately sent overnight, certified mail with tracking and return receipt, to the attention of Campbell Hawkins, the Vice President of Customer Care, Duquesne Light Company, 411 Seventh Avenue, MD 6-1, Pittsburgh, PA 15230-1930. I followed it up with an email to the Customer Care email contact, customer care@duqlight.com.

In addition, I posted a signed copy NOTICE OF NON-CONSENT... to the Installation of a "Smart Digital Meter", which was mailed and emailed to Duquesne Light Customer Care, which was posted at the meter box. And, a notice by the front window well before the meter, stating that we do not consent to the installation of a Smart Meter. I took time and date stamped photos to document these postings.



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20160927_161521.jpg

We expected to hear a response from Duquesne Light; but, we did not.

9/29/2016. After not hearing anything from Duquesne Light, I sent another email to Duquesne Customer Care, further explaining our concerns.

9/30/2016. After still not hearing anything back from Duquesne Light, I contacted the PA Attorney General's Office and they sent me this Pennsylvania Public Utility Commission Formal Complaint form, and told me that I can file a complaint to prevent the installation. I again sent an email to Duquesne Customer Care, and informed Mr. Hawkins that had been in contact with the Attorney General's Office and had obtained the PUC complaint form.

From 9/26/206 - 10/01/2016, I have contacted and been on the phone with my PA Representative Joseph Markosek and my PA Jim Brewster Senator. I have also been in contact with PA Representative Mike Reese the sponsor of a Opt-out bill in the PA House, which has no less than 16 co-sponsors, and PA Senator Don White the sponsor of an Opt-out bill in the PA Senate, both members of their respective Consumer Affairs Committees. I also contacted PA Representatives Peter Dailey and Robert Godshall. Most have been overwhelming supportive of an Opt-out for Pennsylvania residents. As indicated above, I have also been in contact with the PA Attorney General's office, and with the office of Governor Wolf, who asked me to send him my concerns and my reasons for those concerns. I also spoke with my local police department about my rights as a resident, and I have spoken with my mayor, Mayor Greg Erosenko, who expressed support for my concerns. I can supply all of my communications which these officials, the majority of which expressed support for my concerns.

10/1/2016. As of this date, I have not received any communication from Duquesne Light, so I am moving forward with this complaint to stop them from installing this questionable technology.

So, what are my concerns and complaints?

There are many. I have been in contact with recognized independent experts in this area who have published extensively on this matter. Not the least among them is, Dr. Ronald Powell. Dr. Powell is a retired U.S. Government scientist (Ph.D., Applied Physics, Harvard University, 1975). During his Government career, he worked for the Executive Office of the President, the National Science Foundation, and the National Institute of Standards and Technology. For those organizations, respectively, he addressed Federal R&D program evaluation, energy policy research, and measurement development in support of the electronics and electrical-equipment industries and the biomedical research community. He currently interacts with other scientists and with doctors around the nation on the impact of the environment – including the radiofrequency (RF) environment – on human health.

I am supplying just a few of his reports with this complaint which validate my concerns.

First, I am providing his report entitled, **"Ranking Electricity Meters for Risk to Health, Privacy, and Cyber Security"** which provides a succinct overview of all of the risks associated with the Digital Smart Meters. The Smart Meters and other competitive technologies, including the current Analog Meters were assessed and graded in the areas of Risk to Health, Privacy, and Cyber Security. In short, the analysis concluded that Smart Meters were the worst, of the worst, of the available technologies in all 3 categories. It clearly indicates that Pennsylvania is replacing a robust, reliable, fully functioning technology with an immature, fragile, and I might add dangerous technology, that compromises the well-being of the residents of Pennsylvania. It also actually weakens the electrical infra-structure of the state, and makes it more, not less, susceptible to hacking, and abuse.

Dr. Powell is a credible independent expert who testified before the Maryland General Assembly, and was in no small measure one of the reasons that Maryland now has an Opt-Out option available to its residents, and many of them are exercising their option to Opt-Out. So, next, I am providing the testimony he gave there in his document entitled, **"A Message to the Maryland General Assembly on the Danger of Smart Meters"** by Ronald Powell PhD. In his testimony, he detailed the specific health problems that have already been linked with the RF radiation given off by these Smart Meters, with specific reference to 3 wide ranging reviews of the findings that have been published by the international biomedical research community,

namely "The BioInitiative 2012 Report", "Health Effects of RF - Research Review" (at the FCC), and "Electromagnetic Sensitivity and Electromagnetic Hypersensitivity: A Summary". There is also reference to a number of medical associations such as the American Academy of Environmental Medicine and the American Academy of Pediatrics (AAP).

All provide irrefutable evidence correlating RF exposure to neurological, cardiac, and pulmonary disease, as well as reproductive and developmental disorders, immune dysfunction, cancer, and other health conditions. Everyone is susceptible to this; but, those that are most vulnerable are the young, the elderly, and women who are pregnant. No less than the World Health Organization (WHO) has recognized this fact.

The RF signals from a Smart Meters are effectively orders of magnitude greater than a cell phone, about which many health questions have been raised. The signal goes out in all directions, it is not aimed away from the residence. So, it penetrates and literally pollutes and contaminates the living environment of the residence.

Dr. Powel points out that the risks to health arise primarily from the fact that many electricity meters communicate wirelessly with the electric power companies. They transmit radiofrequency (RF) radiation, at microwave frequencies, day and night, every day of the year, forever. That radiation travels through homes and businesses readily, and penetrates the unborn, the children, and the adults alike, disrupting health. Every transmitting meter in a community irradiates everyone in that community. So does every community-based transmitter/receiver that the electric power companies have erected to communicate wirelessly with those meters.

In the investigative report **"How Dangerous and Expensive Became "Smart" An Exposé of the "Smart Grid"**, by Amy Worthington, Dr. Andrew Goldsworthy, British biologist and expert on the bio-effects of microwave radiation, explains: "The duration of the radiation seems to be more important than its strength, with the effects being cumulative as more and more cells are damaged.

How can we not be concerned and complain about this?

Both, my sister and I are in our early to middle 60s, already dealing with chronic conditions, and we cannot afford to have a new environmental factor introduced that will worsen those conditions, and create new medical problems.

This alone should be sufficient to warrant a waiver to stop the installation of a Smart Meter on our residence. But, there is more for consideration.

Not all installations are being carried out by Duquesne Light certified electricians. Many are being installed by contractors with varying degrees of expertise. There have been not insignificant instances of fires and damage to the properties that the Smart Meters were installed on, a number those occurring within the state of Pennsylvania itself. In general, the power is not turned off at the utility pole before work is carried out on the meter. Tests for "hot sockets" are not generally carried out, and the residences are not certified that the sockets are safe/up to code before any installation. Typically, the meters are just changed out.

Fires have occurred that have been traced to the quality of the meter construction, the quality of the installation, and the quality of the wiring in the residence, which is generally not evaluated before installation. Refer to **"Wireless Smart Meters and Potential for Electrical Fires"** and

"Smart Meters Increase the Risk of Fires!" to name just a few sources discussing these terrifying occurrences.

Another fact worth mentioning is that Smart Meters are generally not certified by Underwriters Laboratories (UL). This demonstrates that Smart Meters have been deployed without proper consideration for the safety of the homeowner.

The newer meters may be somewhat better designed than the earlier ones that have been installed; but, this technology is still immature and unproven in many ways. Any number of factors can compromise the proper function of these devices. And, unlike with traditional Analog Meters, when electronic components are overstressed by power fluctuations, etc, there is a potential for the components to explode. It cannot be denied that all Smart Meters have inherent increased fire and safety-related risks compared to traditional Analog Meters.

So, Smart Meters for a number of reasons increase the risk of fire and property damage to homeowners as compared to Analog Utility Meters. And as a result, the resident now has to be worried about a potential ticking "time bomb" attached to their house that may burst into flames at an unpredictable moment for any number of unpredictable reasons, which are completely out of control of the homeowner.

How can we not be concerned and complain about this?

And, the issues do not end there. As indicated in Dr. Powell's report mentioned earlier we have not yet mentioned the areas of privacy and cyber security that have been raised, nor the fact that the predicted economic benefits touted as justification for these devices have just not materialized.

Dr. Powell points out that the risks to privacy arise from the fact that many of the meters capture and transmit very highly time-resolved information about electricity consumption. That detailed information can reveal much about the activities taking place inside the homes and the businesses, sufficient, for example, to reveal when no one is there. Any, semi-competent hacker with criminal intent can monitor these signals to ascertain if there is activity within a residence or not.

Dr. Powell also points out that the risks to cyber security arise, in part, from the fact that some types of meters can accept incoming wireless commands that may come from nefarious sources. Many of those meters can respond to wireless commands to shut off the electrical power to a home or a business entirely, or to accept new software programming. That new programming can alter the functions of the meters and can do so invisibly to the owners of the homes and the businesses.

He further states that the variety of meters now in service, and the many risks that the meters can pose, mean that it has become impossible for the customer of an electric power company to know what capabilities his meter has and what risks those capabilities imply for him, his family, his business, and his community. In short, the electric power companies have moved from the accepted practice of measuring electricity consumption once a month for the purpose of issuing a proper monthly bill, to the questionable practice of monitoring the daily activities inside individual homes and businesses, as reflected in their detailed patterns of electricity consumption. Then, they are broadcasting those details over the air using wireless technology that pollutes entire communities with hundreds of millions of bursts of microwave radiation every day, forever.

In terms of "economic benefits", Palo Alto, for example, has been installing Smart Meters since 2009 but stopped the installation of Smart Meters since they had complaints of health problems and increased electric costs. They concluded that it makes no economic or functional sense to install Smart Meters.

The Attorneys General of three states have opposed Wireless Smart Meters because they find that the costs outweigh any claimed financial benefits to the customers.

A Consumers Digest Investigative Report - "Why Smart Meters Might Be a Dumb Idea", by William J. Kelly carried out an investigation which suggests that Smart Meter conversion represents little more than a boondoggle that is being foisted on consumers by the politically influential companies that make the hardware and software that are required for the Smart Meter conversion. And, he found it difficult to disagree with that assessment by a number of experts. From a consumer's perspective, they found that the potential negative consequences outweigh the benefits in three critical areas: cost, rate changes, and energy savings.

They further found that the cost of a smart meter runs at least \$100 per household, which the home owner will pay for indirectly through fees that are in their electric bill. Then, there are the expenses of installing and operating the meters. Itron, which is one of several companies that makes Smart Meters, estimates that consumers will pay up to \$255 billion to blanket the nation with Smart Meters.

We all live on relatively fixed budgets, and cannot well afford these "economic benefits."

How can we not be concerned and complain about this?

Unfortunately, I could go on and on about the problems related to Smart Meters that warrant complaint. But, I will conclude my presentation at this point with the final statement that the bottom-line is that the issues with Smart Meters are so numerous and severe that they can no longer just be dismissed and cast aside. We appeal to the common sense and good conscience of the members of the PUC to recognize these legitimate complaints and serious risks to our health and our well-being, and provide us with a waiver to stop the replacement of our mature, reliable, fully functional, and comparatively safe Analog Meter with an immature, uncertain, fragile, unnecessary, and dangerous Smart Digital Meter.

Other states and countries have already recognized the seriousness of this issue and have acted to protect their citizens from these questionable devices, and more are in the process of doing so. Governors and Attorney Generals have acted in a number of states such as Connecticut, Michigan, and Illinois; they have stepped in to protect their citizens. Communities have not just implemented Opt-out programs, they have and are banning their installation, and are actually implementing rollback programs to have the already installed Smart Meters removed.

I ask myself, how can Pennsylvania not act in the same responsible manner? Are we as Pennsylvania residents less valued by our state government and regulatory agencies? Are we not the greatest resource that the state of Pennsylvania possesses? Are we not worth the effort to make the right decision, if not necessarily the easy decision?

I have told my state and city representatives that if someone sees a fire starting and reports it, or if someone sees a criminal act happening and reports it, the Fire Department and the Police Department don't just sit there in their chairs waiting until 10 people, or 20 people, or 100 people call it in. No, it only takes one call by one person for them to act, to be there, to do their job, to do what is right and honorable, and to protect and serve the people who depend and count on them for their safety and well-being.

Thank you for listening to my complaint.

Supporting documents supplied with this complaint:

01. 09/27/2016 - NOTICE OF NON-CONSENT TO TRESPASSING AND SURVEILLANCE, NOTICE OF LIABILITY Concerning Your Intent to Install a "Smart Digital Meter", which was mailed and emailed to Duquesne Light Customer Care to the attention of Campbell Hawkins, Vice President of Customer Care.
02. 09/29/2016 - Duquesne Light Customer Care. - ATTENTION: Campbell Hawkins VP of Customer Care, which was emailed.
03. 09/30/2016 - Duquesne Light Customer Care. - ATTENTION: Campbell Hawkins VP of Customer Care, which was emailed.
04. 09/27/2016 -10/01/2016 - My communications with various government agencies, from my city Mayor to Governor Wolf, can be supplied upon request.
05. "Ranking Electricity Meters for Risk to Health, Privacy, and Cyber Security", by Ronald Powell, Ph'd.
06. "A Message to the Maryland General Assembly - The Health Argument for Replacing Wireless Smart Meters with a Safe Metering Technology in Maryland", by Ronald Powell, Ph'd.
07. How Dangerous and Expensive Became "Smart" An Exposé of the "Smart Grid", by Amy Worthington, of westonaprice.org, which carried out a detailed investigative report of the issue, and concluded with the recommendation to resist attempts at installation of these hazardous devices.

The amount of information detailing the numerous problems associated with Smart Meters is currently so vast that it would be impossible to list it all here. But, a few additional supporting references are listed below:

01. **Public Health Physician Warns of Smart Meter Dangers, Stresses Need for Analog Option**
http://www.youtube.com/watch?v=n7L21XOC2wA&feature=player_embedded
02. **Smart Meters Emit Constant Microwave Radiation: WUSA9 News**

<https://www.youtube.com/watch?v=eGdAefQ8nbq>

03. Sacramento Environmental Consultant Eric Windheim in this months' Health & Fitness Magazine, "Living Inside an Electric Cage Without Knowing it" by Dr. Doma
https://issuu.com/healthfitness.us/docs/h_fm_julyaugust_2016?e
04. **Wireless Smart Meters and Potential for Electrical Fires**
<http://eon3emfblog.net/wp-content/uploads/2010/09/Wireless-Smart-Meters-and-Potential-for-Electrical-Fires.pdf>
05. **Smart Meters Increase the Risk of Fires!**
<https://smartgridawareness.org/2014/08/03/smart-meters-increase-the-risk-of-fires/Smart>
06. **Consumers Digest Investigative Report - "Why Smart Meters Might Be a Dumb Idea"**, by William J. Kelly
<http://www.consumersdigest.com/special-reports/why-smart-meters-might-be-a-dumb-idea>
07. **SMART METERS: No Federal Mandate**
<http://ppjg.wordpress.com/2011/08/15/smart-meters-no-federal-mandate/>
08. **Ontario Pulls Plug on 36,000 Rural 'Smart' Meters**, January 20, 2016 by Josh del Sol
<http://www.collective-evolution.com/2016/01/20/ontario-pulls-plug-on-36000-rural-smart-meters-is-big-energy-imploding/>

Note: If your complaint is only about removing or modifying a municipal lien filed by the City of Philadelphia, the Public Utility Commission (PUC) cannot address it. Only local courts in Philadelphia County can address this type of complaint. The PUC can address a complaint about service or incorrect billing even if that amount is subject to a lien.

In addition, the PUC generally does not handle complaints about cell phone or Internet service, but may be able to resolve a dispute regarding voice communications over the Internet (including the inability to make voice 911/E911 emergency calls) or concerns about high-speed access to Internet service.

5. Requested Relief

How do you want your complaint to be resolved? Explain what you want the PUC to order the utility or company to do. Use additional paper if you need more space.

Independent experts across the country have published findings detailing the Health, Safety, Cost, Privacy, and Health risks associated with these Smart Digital Meters.

I supplied a few of those findings with this complaint. There is much more evidence of these risks available, and it continues to grow. These issues cannot be simply dismissed or ignored.

Other states have acted to protect their citizens from these questionable devices, and more are in the process of doing so. Governors and Attorneys General have acted in a number of states such as Connecticut, Michigan, and Illinois; they have stepped in to protect their citizens.

We are entering our retirement years and are already dealing with some uncomfortable chronic issues. We cannot afford to have a new environmental factor introduced that will worsen those conditions, and create new problems. Evidence has been presented that the RF environment produced by these devices is particularly damaging to the elderly and the young, and also to women who are pregnant. It is nothing less than a new type of pollution being introduced into the home living environment.

In light of the increasing and irrefutable evidence from the WHO, the AAEM, experts like Dr. Powell, et al, concerning the serious risks in the areas of Health, Safety, Cost, Privacy, and Security of Smart Meters, we are asking for a waiver to prevent the forced installation of this device on our residence.

We hope that the PUC will give these undeniable facts the true weight that they merit, and grant us in good conscience this waiver to keep our current fully functional analog meter, and prevent the installation of a questionable and hazardous Smart Digital Meter.

Note: The PUC can decide that a customer was not billed correctly and can order billing refunds. The PUC can also fine a utility or company for not following rules and can order a utility or company to correct a problem with your service. Under state law, the PUC cannot decide whether a utility or company should pay customers for loss or damages. Damage claims may be sought in an appropriate civil court.

6. **Protection From Abuse (PFA)**

Has a court granted a "Protection From Abuse" order that is currently in effect for your personal safety or welfare? The PUC needs this information to properly process your complaint so that your identity is not made public.

Note: You must answer this question if your complaint is against a natural gas distribution utility, an electric distribution utility or a water distribution utility AND your complaint is about a problem involving billing, a request to receive service, a security deposit request, termination of service or a request for a payment agreement.

Has a court granted a "Protection From Abuse" order for your personal safety or welfare?

YES ☐

NO ☒

If your answer to the above question is "yes," attach a copy of the current Protection From Abuse order to this Formal Complaint form.

7. **Prior Utility Contact**

a. Is this an appeal from a decision of the PUC's Bureau of Consumer Services (BCS)?

YES ☐

NO ☒

Note: If you answered yes, move to Section 8. No further contact with the utility or company is required. If you answered no, answer the question in Section 7 b. and answer the question in Section 7 c. if relevant.

b. If this is not an appeal from a BCS decision, have you spoken to a utility or company representative about this complaint?

YES ☐

NO ☒

Note: You must contact the utility first if (1) you are a residential customer, (2) your complaint is against a natural gas distribution utility, an electric distribution utility or a water utility AND (3) your complaint is about a billing problem, a service problem, a termination of service problem, or a request for a payment agreement.

- c. If you tried to speak to a utility company representative about your complaint but were not able to do so, please explain why.

We have expressed our concerns, and our opposition to having a Smart Meter installed, by certified RRR direct mail and by email. Copies have been sent to our PA state Senator and Representative, and others. We are awaiting a response from a Duquesne Light representative.

Note: We have also contacted the PA Attorney General's office, the Governor's office, and the Mayor's office.

Note: Even if you are not required to contact the utility or company, you should always try to speak to a utility or company representative about your problem before you file a Formal Complaint with the PUC.

8. Legal Representation

If you are filing a Formal Complaint as an individual on your own behalf, you are not required to have a lawyer. You may represent yourself at the hearing.

If you are already represented by a lawyer in this matter, provide your lawyer's name, address, telephone number, and e-mail address, if known. Please make sure your lawyer is aware of your complaint. If represented by a lawyer, both you and your lawyer must be present at your hearing.

Lawyer's Name We currently have not contacted an Attorney, but may do so shortly

Street/P.O. Box _____

City _____ State _____ Zip _____

Area Code/Phone Number _____

E-mail Address (if known) _____

Note: Corporations, associations, partnerships, limited liability companies and political subdivisions are required to have a lawyer represent them at a hearing and to file any motions, answers, briefs or other legal pleadings.

9. **Verification and Signature**

You must sign your complaint. Individuals filing a Formal Complaint **must** print or type their name on the line provided in the verification paragraph below and **must** sign and date this form in **ink**. If you do not sign the Formal Complaint, the PUC **will not accept it**.

Verification:

I Michele Hriadil, Francis Hriadil, hereby state that the facts above set forth are true and correct (or are true and correct to the best of my knowledge, information and belief) and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa. C.S. § 4904 (relating to unsworn falsification to authorities).

Michele Hriadil, Francis Hriadil 10/1/2016
(Signature of Complainant) (Date)

Title of authorized employee or officer (only applicable to corporations, associations, partnerships, limited liability companies or political subdivisions)

Note: If the Complainant is a corporation, association, partnership, limited liability company or political subdivision, the verification **must** be signed by an authorized officer or authorized employee. If the Formal Complaint is **not signed** by one of these individuals, the PUC **will not accept it**.

10. **Two Ways to File Your Formal Complaint**

Electronically. You must create an account on the PUC's eFiling system, which may be accessed at <http://www.puc.pa.gov/efiling/default.aspx>.

Note: If you are appealing your Bureau of Consumer Services (BCS) decision, you must file your formal complaint by mail.

Mail. Mail the completed form with your original signature and any attachments, by certified mail, first class mail, or overnight delivery to this address:

Secretary
Pennsylvania Public Utility Commission
400 North Street
Harrisburg, Pennsylvania 17120

Note: Formal Complaints sent by fax or e-mail will **not** be accepted.

If you have any questions about filling out this form, please contact the Secretary's Bureau at 717-772-7777.

Keep a copy of your Formal Complaint for your records.

Supporting Document 01 of 07 - PA PUC Formal Complaint

09/27/2016 - NOTICE OF NON-CONSENT TO TRESPASSING AND SURVEILLANCE, NOTICE OF LIABILITY
Concerning Your Intent to Install a "Smart Digital Meter", a signed copy which was mailed and this copy which was
emailed to Duquesne Light Customer Care to the attention of Campbell Hawkins, Vice President of Customer Care.

From: hriadil <hriadil@attglobal.net>

To: customercare@duqlight.com

Date: Tue, 27 Sep 2016 16:19:48 -0400

Subject: NOTICE OF NON-CONSENT TO TRESPASSING AND SURVEILLANCE, NOTICE OF
LIABILITY Concerning Your Intent to Install a "Smart Digital Meter"

--- NOTICE ---

I have also posted this notice on my Meter,
and recorded a time-stamped and dated picture to verify the Posting.

I will videotape any removal and replacement of my meter, against my consent.

From: Michele Hriadil
331 Shady Ridge Drive
Monroeville, PA 15146-7510

RECEIVED

OCT 3 2016

To: ATTN: Campbell Hawkins
Vice President of Customer Care
Customer Care Center
DUQUESNE LIGHT COMPANY
411 Seventh Avenue, MD 6-1
Pittsburgh, PA 15230-1930

PA PUBLIC UTILITY COMMISSION
SECRETARY'S BUREAU

Date: 9/27/2016

Account # 406745000

NOTICE OF NON-CONSENT TO TRESPASSING AND SURVEILLANCE, NOTICE OF LIABILITY

Dear Duquesne Light and all agents, officers, employees, contractors and interested parties,

If you intend to install a "Smart Meter" or any activity monitoring device at the above address, you and all other
parties are hereby denied consent for installation and use of all such devices on the above property.
Installation and use of any activity monitoring device is hereby refused and prohibited.

Informed consent is legally required for installation of any surveillance device and any device that will collect
and transmit private and personal data to undisclosed and unauthorized parties for undisclosed and
unauthorized purposes. Authorization for sharing of personal and private information may only be given by the
originator and subject of that information. That authorization is hereby denied and refused with regard to the
above property and all its occupants. "Smart Meters" and digital meters violate the law and cause
endangerment to residents by the following factors:

1. They individually identify electrical devices inside the home and record when they are operated causing
invasion of privacy.
2. They monitor household activity and occupancy in violation of rights and domestic security.

3. They transmit wireless signals which may be intercepted by unauthorized and unknown parties. Those signals can be used to monitor behavior and occupancy and they can be used by criminals to aid criminal activity against the occupants.

4. Data about occupant's daily habits and activities are collected, recorded and stored in permanent databases which are accessed by parties not authorized or invited to know and share that private data by those who's activities were recorded.

5. Those with access to the smart meter databases can review a permanent history of household activities complete with calendar and time-of-day metrics to gain a highly invasive and detailed view of the lives of the occupants.

6. Those databases may be shared with, or fall into the hands of criminals, blackmailers, corrupt law enforcement, private hackers of wireless transmissions, power company employees, and other unidentified parties who may act against the interests of the occupants under metered surveillance.

7. "Smart Meters" are, by definition, surveillance devices which violate Federal and State wiretapping laws by recording and storing databases of private and personal activities and behaviors without the consent or knowledge of those people who are monitored.

8. It is possible for example, with analysis of certain "Smart Meter" data, for unauthorized and distant parties to determine medical conditions, sexual activities, physical locations of persons within the home, vacancy patterns and personal information and habits of the occupants.

9. Your company has not adequately disclosed the particular recording and transmission capabilities of the smart meter, or the extent of the data that will be recorded, stored and shared, or the purposes to which the data will and will not be put.

10. Electromagnetic and Radio Frequency energy contamination from smart meters exceeds allowable safe and healthful limits for domestic environments as determined by the EPA and other scientific programs.

I forbid, refuse and deny consent of any installation and use of any monitoring, eavesdropping, and surveillance devices on my property, my place of residence and my place of occupancy. That applies to and includes "Smart Meters" and activity monitoring devices of any and all kinds. Any attempt to install any such device directed at me, other occupants, my property or residence will constitute trespass, stalking, wiretapping and unlawful surveillance and endangerment of health and safety, all prohibited and punishable by law through criminal and civil complaints. All persons, government agencies and private organizations responsible for installing or operating monitoring devices directed at or recording my activities, which I have not specifically authorized in writing, will be fully liable for a fee of \$100,000.00 for any violations, intrusions, harm or negative consequences caused or made possible by those devices whether those negative consequences are provided by "law" or not.

This is legal notice. After this delivery the liabilities listed above may not be denied or avoided by parties named and implied in this notice. Civil Servant immunities and protections do not apply to the installation of smart meters due to the criminal violations they represent.

Notice to principal is notice to agent and notice to agent is notice to principal. All rights reserved.

Michele Hriadil

Francis Hriadil.

PS: A copy of this notice has been sent to my State Representative as well.

Supporting Document 02 of 07 - PA PUC Formal Complaint

09/29/2016 - Duquesne Light Customer Care. - ATTENTION: Campbell Hawkins VP of Customer Care, which was emailed, after not hearing anything from Duquesne Light.

To: customercare@duqlight.com
From: hriadil <hriadil@attglobal.net>
Date: Thu, 29 Sep 2016 09:49:29 -0400
Subject: Duquesne Light Customer Care. - ATTENTION: Campbell Hawkins VP of Customer Care

Cc: jmarkose@pahouse.net, Mreese@pahousegop.com, brewster@pasenate.com, dwhite@pasen.gov

Dear Mr. Hawkins,
Vice President of Customer Care.
Duquesne Light Company.

In the past few days I have sent you our objections to the planned installation of a Smart Meter on our residence.

I hope you can understand that we have no animosity towards Duquesne Light. Prior to this issue, your service to us has been professional and exemplary.

I also hope that you can understand that we have grave concerns about this technology and its ramifications regarding safety, privacy, and health.

We are for improving the system, as long as that is what it really does. Unfortunately, everything that we have been able to find out relating to this matter from independent sources and experiences in other states, does nothing but make us increasingly concerned. I have spoken to members in the PA House and Senate, both of which have bills in committee for a formal Opt-Out option in PA, which other states have or are implementing. I have talked with the Attorney General's Office in PA, and my local police.

This is why we are asking Duquesne Light to postpone any planned installation of a Smart Meter on our residence at 331 Shady Ridge Drive; Monroeville, PA 15146.

In light of all of the controversy, and questions, we would request that Duquesne Light have some consideration and compassion in this matter.

If in the future, the safety, privacy, and health issues can be successfully and credibly addressed, than we would have no objections to any upgrade that improves the quality of service and life for everyone.

I hope that Duquesne Light can appreciate and understand this position. I assume that you and all of your employees are residents of Pennsylvania, as are all of your family members. So, the consequences of this unproven technology will be felt by you as well.

We have no problem talking with any representative of Duquesne Light about this at any time. And, if Duquesne Light can verify that the EMF emissions are no more than a cellphones, and that they do not penetrate and contaminate the living environment of our dwelling, and that the other issues of concern have also been addressed, then we will have no problem with an upgrade of the equipment.

That is all we are asking.

Sincerely,
Francis Hriadil.

Supporting Document 03 of 07 - PA PUC Formal Complaint

09/29/2016 - Duquesne Light Customer Care. - ATTENTION: Campbell Hawkins VP of Customer Care, which was emailed, after not hearing anything from Duquesne Light.

From: hriadil <hriadil@attglobal.net>

To: customercare@duqlight.com

Date: Fri, 30 Sep 2016 09:49:10 -0400

Subject: Duquesne Light Customer Care. - ATTENTION: Campbell Hawkins VP of Customer Care

Cc: jmarkose@pahouse.net, Mreese@pahousegop.com, brewster@pasenate.com, dwhite@pasen.gov, consumers@attorneygeneral.gov

Dear Mr. Hawkins.

Vice President of Customer Care

Duquesne Light Company

I have spoken with the Office of the PA Attorney General's Office about our concerns about issues related to safety, privacy, and health with regard to these Smart Meters, and obtained the paperwork for a Formal Complaint with the Pennsylvania Public Utility Commission.

We are asking you to not come to the property at 331 Shady Ridge Drive to install a Smart Meter at this time.

I will be speaking to the Governor's Office about this today.

Thank you for your cooperation and consideration.

Francis Hriadil.

Supporting Document 04 of 07 - PA PUC Formal Complaint

09/27/2016 -10/01/2016 - My communications with various government agencies, from my city Mayor to Governor Wolf, can be supplied upon request.

09/27/2016 - PA Representative Joseph Markosek

PA Representative Mike Reese

PA Representative Joseph Markosek

09/28/2016 - PA Representative Robert Godshall

PA Representative Peter J. Daley by phone

09/29/2016 - PA Representative Robert Godshall

- PA Attorney General Beemer's Office

- PA Representatives Joseph Markosek, Mike Reese
PA Senators Jim Brewster, Don White

09/30/2016 - PA Representatives Joseph Markosek, Mike Reese
PA Senators Jim Brewster, Don White

- Governor Tom Wolf's Office

- Mayor Greg Erosenko

10/01/2016 - Governor Tom Wolf's Office

- Mayor Greg Erosenko

In addition, to emails, I have been on the phone with the various offices of these individuals and the Monroeville Police Department, throughout this period, concerning this issue.

Supporting Document 05 of 07 - PA PUC Formal Complaint

"Ranking Electricity Meters for Risk to Health, Privacy, and Cyber Security", by Ronald Powell, Ph.D.

[<https://www.scribd.com/document/289782183/Ranking-Electricity-Meters-for-Risk-to-Health-Privacy-and-Cyber-Security>]

November 12, 2015,

Edition 3,

Ronald M. Powell, Ph.D.

Ranking Electricity Meters for Risk to Health, Privacy, and Cyber Security

Table 1 summarizes the risk rankings of electricity meters, based on the detailed analysis that follows. "5" is the highest risk. Blank is the lowest risk. Capital letters group meters with similar, but not necessarily identical, risk rankings. The priorities among the three types of risk addressed are these:

- **Health:** The meters are arranged in descending order by Risk to Health, which the author believes to be the single most important risk factor.
- **Privacy:** The meters with the same Risk to Health are arranged in descending order by Risk to Privacy.
- **Cyber Security:** The meters with the same Risk to Health and the same Risk to Privacy are arranged in descending order by Risk to Cyber Security.

The Wireless Smart Meter poses the highest risk in all three categories of risk. In contrast, the Traditional Analog Meter poses the lowest risk in all three categories of risk. This analog meter can also be correctly called:

- Traditional Analog Mechanical Meter
- Traditional Analog Electromechanical Meter
- Traditional Analog Mechanical Meter with No Wireless Communications Capability
- Traditional Analog Mechanical Meter with No Electronic Circuitry.

Table 1: Summary of Risk Rankings

Meter Category	Type of Communication	Overall Risk		
		Risk to Health	Risk to Privacy	Risk to Cyber Security
G SMART METER	Wired	5	5	5
AMR Meter	Bubble Up	4	4	
F Analog Meter (plus wireless digital electronics)	Bubble Up	4	4	
AMR Meter	Wake Up	3	2	
E Analog Meter (plus wireless digital electronics)	Wake Up	3	2	
SMART METER	Internet cable/fiber	2	4	4
AMR Meter	Internet cable/fiber	2	4	
C SMART METER	Telephone landline	2	3	3
AMR Meter	Telephone landline	2	1	
B Basic Digital Electronic Meter	None	2		
A Traditional Analog Meter	None			

Introduction¹

¹ The author, Ronald M. Powell, is a retired career U.S. Government scientist (Ph.D. in Applied Physics from Harvard University, 1975). During his Government career, he worked for the Executive Office of the President, the National Science Foundation, and the National Institute of Standards and Technology. Contact: (301) 926-7568, ronpowell@verizon.net.

The manufacturers of electricity meters offer a wide variety of models. And many of these models are available with a dozen or so options, leading to many possible combinations. These meters have capabilities beyond what is required to measure the electricity consumed for the purpose of issuing a monthly bill. Unfortunately, the new capabilities present a host of risks to health, to privacy, and to cyber security, as has been widely discussed elsewhere. But, briefly stated --

- The risks to health arise primarily from the fact that many electricity meters communicate wirelessly with the electric power companies. They transmit radiofrequency radiation, at microwave frequencies, day and night, every day of the year, forever. That radiation travels through homes and businesses readily, and penetrates the unborn, the children, and the adults alike, disrupting health. Every transmitting meter in a community irradiates everyone in that community. So does every community-based transmitter/receiver that the electric power companies have erected to communicate wirelessly with those meters.
- The risks to privacy arise from the fact that many of the meters capture and transmit very highly time-resolved information about electricity consumption. That detailed information can reveal much about the activities taking place inside the homes and the businesses, sufficient, for example, to reveal when no one is there.
- The risks to cyber security arise, in part, from the fact that some types of meters can accept incoming wireless commands that may come from nefarious sources. Many of those meters can respond to wireless commands to shut off the electrical power to a home or a business entirely, or to accept new software programming. That new programming can alter the functions of the meters and can do so invisibly to the owners of the homes and the businesses.

The variety of meters now in service, and the many risks that the meters can pose, mean that it has become impossible for the customer of an electric power company to know what capabilities his meter has and what risks those capabilities imply for him, his family, his business, and his community. In short, the electric power companies have moved --

- from the accepted practice of measuring electricity consumption once a month for the purpose of issuing a proper monthly bill
- to the questionable practice of monitoring the daily activities inside individual homes and businesses, as reflected in their detailed patterns of electricity consumption
- then broadcasting those details over the air using wireless technology that pollutes entire communities with hundreds of millions of bursts of microwave radiation every day, forever.

Purpose of this Document

The purpose of this document is to provide some perspective about the types of meters available and the relative risks that they pose. Because there are so many types of meters available, not all of them could be addressed here. The meters selected for this document are those that I have seen in service most often in my state of Maryland. Many, if not most, of these meters are also employed in other states.

Principal Conclusions

Only one type of meter, the Traditional Analog Mechanical Meter with No Wireless Communications Capability, represented by the last row in Table 2 on page 6, offers all three of the following positive characteristics:

- no risk to health from RF radiation exposure, because it generates no RF radiation
- no risk to privacy, because it cannot be remotely read
- no risk to cyber security, because it cannot be remotely accessed so it cannot be hacked.

In sum, the meter that poses the lowest risk to health, to privacy, and to cyber security is the Traditional Analog Mechanical Meter with No Wireless Communications Capability. Tragically, this is the meter that many electric power companies in many states, including my state of Maryland, have chosen to remove.

Only one type of meter examined here, the Wireless Smart Meter, represented by the first row in Table 2 on page 6, has all three of the following negative characteristics:

- the highest risk to health because it has the highest Peak Radiofrequency (RF) Power Output, and because it has either the first or the second highest number of bursts of RF radiation per day, depending on its operating mode
- the highest risk to privacy because its data are potentially accessible to the second largest number of people, but with the greatest ease of access to the data stream (because it is wireless), and because it provides data with the greatest timeliness, the greatest granularity (finest time-resolution), and the greatest variety (most types of data), all of which make that data highly intrusive
- the highest risk to cyber security because it is potentially accessible to the second largest number of people, but again with the greatest ease of access (because it is wireless), and because it is the most vulnerable to being harmed itself, and because it is the most able to cause harm
 - because it contains a shutdown switch capable of shutting off all power to the customer when triggered to do so by a wireless remote signal

- o because it is software reprogrammable to perform new functions, whether beneficial or harmful, entirely invisibly to the customer.

In sum, the meter that poses the highest risk to health, to privacy, and to cyber security is the Wireless Smart Meter. Tragically, this is the meter that many electric power companies in many states, including my state of Maryland, have chosen to install.

The other meters discussed in this document fall somewhere in between the above two meters.

- All of these other meters pose a risk to health from RF radiation exposure, although to widely differing degrees.
- All, but one of those other meters, pose a risk to privacy.
- Two of those other meters pose a risk to cyber security.

Organization of the Rest of this Document

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Sources of Radiofrequency (RF) Radiation.....	9
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Wired Methods of Communication.....	11
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Ranking Electricity Meters for Risk to Health

Table 2 on page 6 ranks electricity meters for their risk to health, based on the characteristics of the "Sources of Radiofrequency (RF) Radiation" that the meters contain. All of the terms used in the table are described in the text that immediately follows the table.

The rows in the table name the "Meter Category" into which each meter falls and the "Type of Communication", whether wireless or wired, that each meter employs. In the central part of the table, the column headings and subheadings describe the "Sources of Radiofrequency (RF) Radiation" in each meter and the characteristics that those sources have that are of relevance to their risk to health. The presence of a red cell in a given row and column means that the meter described in the heading of that row employs the RF radiation source described in the heading of that column and poses a risk to health.

The first of the column subheadings indicates the "Peak RF Power Output" of each RF source. Note that the sources are arranged, from left to right, from the lowest to the highest levels of Peak RF Power Output. Peak RF Power Output is one of the most important factors affecting the risk to health. The higher the Peak RF Power Output, if other factors are equal, the more RF radiation is being delivered and the higher the associated risk to health.

The second of the column subheadings indicates the number of "Bursts of RF (Radiation) per Day" or per month, if known, issued by each Source of RF Radiation. The higher the number of Bursts of RF Radiation per Day, the more RF radiation is being delivered and the higher is the associated risk to health.

The last column on the right side of Table 2 labeled "Overall Risk", shows a numeric ranking for the "Risk to Health", for each row, that is for a given meter with a given type of communication. The higher that number, the higher is the associated risk to health. All of the numbers in the red cells under "Risk to Health" indicate a rank order. That is a Rank 5 meter presents more risk to health than a Rank 4 meter. Rank 5 represents the highest risk, and a blank cell represents the lowest risk. Note that the rankings are not quantitative beyond the order that they indicate. That is, the rankings do not indicate how much a given meter differs from another. The quantitative difference is better judged by examining the differences in Peak RF Power Output and in Bursts of RF per Day, where those numbers have been provided. In some cases, I did not have good numbers to offer, but I still made an educated, but only qualitative, guess, such as "very low" or "high". The purpose was to indicate the range into which I would expect the actual numbers, if known, to fall. I flagged each such entry as "unknown".

Note that no meter in Table 2 has Risk 1. That is largely because every electricity meter in the table, except the Traditional Analog Meter, has at least two sources of RF Radiation: digital electronics and a switching power supply. Both of these sources generate RF radiation even if at a very low Peak RF Power Output. Note that I assume here that all meters with digital electronics have switching power supplies, even though I have not been able to confirm this. Only one meter, the Traditional Analog Meter, has no sources of RF radiation and thus merits a blank for Risk to Health, indicating that it is clearly the safest meter for health of them all.

Table 2: Ranking Electricity Meters for Risk to Health

(RED means "generates radiofrequency radiation at a level potentially risky to health")

Sources of Radiofrequency (RF) Radiation in Meter										Overall Risk 5 is highest. Blank is lowest.
Meter Category ↓	Type of Communication ↓	Unintentional Radiators		Intentional Radiators (transmitters)				Risk to Health		
		Digital Electronics	Switching Power Supply	Not Networked Transmitter/Receivers		Home Area Network (HAN) Transmitter/Receiver	Wide Area Network (WAN) Transmitter/Receiver			
	Peak RF Power Output →	very low (unknown)	very low (unknown)	low (1 mW)	low to medium (1-100 mW)	medium (100 mW)	high (1000 mW)		5	
	Bursts of RF per Day →	high (unknown)	high (unknown)	low (8 per month)	high (50,000 per day)	high (unknown)	high (10,000 (avg) to 190,000 (max) per day)		2	
SMART METER Digital Advanced Metering Infrastructure (AMI)	wireless								2	
	WAN/HAN	✓							4	
	Internet cable/fiber		✓						3	
	Telephone landline		✓						2	
Digital Automated Meter Reading (AMR)	Bubble Up	✓							2	
	Wake Up	✓							2	
	Internet cable/fiber		✓						2	
	Telephone landline		✓						2	
Basic Digital Electronic Meter	None								2	
Analog Meter (plus wireless digital electronics)	Bubble Up	✓							4	
	Wake Up	✓							3	
Traditional Analog Meter	None									

Description of Electricity Meters

Meter Categories

A **Smart Meter** is the key component in what is called the **Advanced Metering Infrastructure (AMI)**. As a result, Smart Meters are often referred to as AMI Meters. The Smart Meter is a digital electronic device that monitors the flow of electricity into, and out of, a customer's residence or business and provides two-way communication between the customer's meter and the electric power company. The information sent to the electric power company describes many characteristics of that flow of electricity, and on a very timely and highly time-resolved ("granular") basis. That communication is usually accomplished with a wireless transmitter/receiver, called a Wide Area Network (WAN) because it has a high enough Peak RF Power Output to travel great distances. It is this WAN which gives rise to most of the health concerns about Smart Meters, while simultaneously heightening both the privacy and the cyber-security concerns, both because of the wide area covered by the signals and because of the accessibility of any signal sent through the air.

Each Smart Meter can be, and usually is, equipped with a second **wireless transmitter/receiver**, called a Home Area Network (HAN), to communicate wirelessly with individual so-called Smart Appliances located inside a home or a business, further heightening health, privacy, and cyber-security concerns. The HAN is intended to return to the electric power company information on the identity and the use of each Smart Appliance in a home or business. Whether the HAN can also enable the electric power company to control those Smart Appliances is unknown to me.

Communication between Smart Meters and electric power companies can also be accomplished with wired technologies, such as telephone landlines and Internet connections (cable or fiber), which significantly reduce the radiation exposure produced by the Smart Meters, but do not eliminate it entirely. Wired communications for Smart Meters are not employed in my state of Maryland, as far as I know. As an example of a wired installation, fiber optic cable is employed in Chattanooga, Tennessee to communicate with that town's Smart Meters.²

² Your Gig is Here. Right here, in Chattanooga (<http://www.chattanoogaig.com/>). How Chattanooga beat Google Fiber by half a decade, The Washington Post, September 17, 2013. (<http://www.washingtonpost.com/blogs/the-switch/wp/2013/09/17/how-chattanooga-beat-google-fiber-by-half-a-decade/>).

The digital Automated Meter Reading (AMR) meter is another category of digital electronic device that monitors the flow of electricity into, and out of, a customer's residence, but not usually at as high a level of detail as a Smart Meter. The AMR meter can provide wireless communication but not usually directly back to the electric power company. Rather, the AMR meters communicate wirelessly with a passing utility vehicle (drive-by reader) or with a passing meter reader on foot (walk-by reader), each equipped with the electronic equipment needed to communicate with the AMR meter. Because the distance over which the AMR meter must communicate is shorter than that of a Smart Meter, the Peak RF Power Output of an AMR meter is usually less than that of a Smart Meter. Two different types of wireless communications are offered: Bubble Up and Wake Up. They are described on page 9. If AMR meters are equipped with the proper options, they can also communicate through wired Internet connections (either cable or fiber optic) or through telephone landlines. Either of these latter two approaches enables communication all the way back to the electric power company, so no drive-by or walk-by meter reader is required.

A **Basic Digital Electronic Meter** is the simplest of all digital electronic meters. It does not employ any wireless or wired communications technology. Such meters are read by a walk-by meter reader who must enter the customer's property. These meters have just two sources of RF radiation -- digital electronics and switching power supply -- so they pose a lower risk to health than some of the other meters. These meters may be able to store a very large amount of data collected between readings by the walk-by meter reader, depending on the options (such as additional electronic memory) that they contain, which may raise some privacy concerns. And that data may be readable very quickly through an electronic or optical interface that the walk-by meter reader connects to the meter. But because such included capability is optional and because these meters are read infrequently (once a month typically), I have ranked these meters as having no risk to privacy. These meters pose no risk to cyber security, either, since they cannot be remotely accessed and therefore cannot be hacked.

An **Analog Meter** (plus wireless digital electronics) is a Traditional Analog Mechanical Meter or, equivalently, a Traditional Analog Electromechanical Meter, to which has been added digital electronic circuits, powered by a switching power supply, to give the meter wireless Wake-Up or wireless Bubble-Up communications capability. These capabilities are discussed further on page 9. They enable the meter to be read remotely from a short distance by a drive-by or a walk-by meter reader so that the meter reader does not have to enter the customer's property.

The **Traditional Analog Mechanical Meter** with no Wireless Communications Capability or, equivalently, the Traditional Analog Electromechanical Meter with No Wireless Communications Capability, is what is usually meant when the shorter descriptions -- Analog Meter, or Analog Mechanical Meter, or Analog Electromechanical Meter -- are used. This meter contains no digital electronic circuits and thus needs no switching power supply to power those circuits. This type of meter contains no sources of RF radiation, whether intentional or unintentional, and thus does not give rise to a risk to health from exposure to RF radiation. This type of meter also poses no risk to privacy because it cannot be remotely read, and it poses no risk to cyber-security because it cannot be remotely accessed and therefore cannot be hacked. This result is reflected in the blank cells across the bottom row of Table 2 on page 6 and the bottom row of Table 3 on page 12, reflecting the fact that this meter is the safest one available with regard to risk to health, privacy, and cyber security.

Sources of Radiofrequency (RF) Radiation

All of the sources of RF radiation in electricity meters can radiate directly into the air. Those sources can also deliver RF electrical current directly into the house wiring, or they can induce RF electrical current in the house wiring, which then can radiate into the air. The sources of radiation are described below in order of increasing Peak RF Power Output. While the sources are of widely different levels, even the least powerful of them, the "Unintentional Radiators", can disrupt highly sensitive individuals and thus cannot be ignored.

Unintentional Radiators are sources of radiofrequency radiation that radiate because of their inherent nature, not because the radiation is needed to perform a communications function.

Digital Electronics operate by turning the flow of electrical current on and off sharply and rapidly. These transitions in current flow produce unintentional radiofrequency radiation, whether or not the same electronics also produce intentional radiofrequency radiation for wireless communication. This unintentional radiation is likely lower in Peak RF Power Output, and higher in frequency, than the unintentional RF radiation from Switching Power Supplies.

Switching Power Supplies convert the high incoming line voltage from the electrical power system to the lower voltages required to power digital electronic circuits. In this conversion process, these supplies turn the flow of electrical current on and off sharply and rapidly. These transitions in current flow produce unintentional radiofrequency radiation. This unintentional radiation is likely higher in Peak RF Power Output, and lower in frequency, than the unintentional RF radiation from Digital Electronics. (Switching power supplies are also called switched-mode power supplies or switching-mode power supplies.)

Intended Radiators are sources of radiofrequency radiation that must radiate to perform their intentional function, which in this case is the transmission of information in a wireless communication system.

The **Not Networked Transmitter/Receiver** category includes both the Bubble-Up and the Wake-Up types of communication for electricity meters. Together these two types of communication are sometimes called "encoder, receiver, transmitter" or "ERT" communications. The meters are not linked together in a network.

Bubble-Up meters send their meter readings as wireless signals every second or so, all day and all night long, every day of the year. The purpose of such frequent transmissions is to assure that a signal is available whenever a drive-by or a walk-by employee of the electric company passes with electronic equipment that can pick up and store the information carried by that signal. Bubble-Up meters are offered with Low and Medium Peak RF Power Outputs. I have not yet learned whether some Bubble-Up meters have a receiver for a different purpose, such as to accept changes in their internal programming.

Wake-Up meters contain receivers that listen for a wireless signal (a "Wake-Up" signal) transmitted by a drive-by or a walk-by meter reader and then respond with a series of transmissions that contain the meter's information. Eight such transmissions, one immediately after the other, appear common. The Wake-Up meters do not transmit at all in between such wake-up signals. As far as I can determine, Wake-Up meters operate only at Low Peak RF Power Output. Because of their infrequent transmissions and their Low Peak RF Power Output, Wake-Up meters produce much less radiofrequency radiation than Bubble-Up meters.

A Home Area Network (HAN) Transmitter/Receiver is one of two wireless methods of two-way communication that is usually, but not always, included in Wireless Smart Meters. The HAN is sometimes called the Zigbee Network, after the technology on which it is based. The HAN is designed to communicate with emerging so-called Smart Appliances inside each home or business. The purpose is to monitor those appliances and to transfer information about their identity and their use back to the electric power company. It is possible, but not yet clear to me, that the HAN will enable the electric power companies to exert a degree of remote control over Smart Appliances. The HAN transmits RF radiation (at microwave frequencies) with a Medium Peak RF Power Output. I have not yet found data on how often the HAN transmits its bursts of RF radiation, but I suspect that the burst rate will be high, like that of other types of local area networks (LANs). Depending on that answer, the radiation produced by the HAN may rival or exceed the radiation produced by the WAN.

A Wide Area Network (WAN) is a wireless method of two-way communication for Smart Meters and usually takes the form of a so-called Mesh Network. The WAN transmits RF radiation (at microwave frequencies) at a High Peak RF Power Output and thus has considerable range, hence the "wide" in Wide Area Network. In such a network the Smart Meters communicate with each other constantly. Each Smart Meter sends information about the use of electricity in the home or the businesses that it primarily serves. Each Smart Meter also relays information from the Smart Meters of neighboring homes and businesses. This relay action helps to assure that the information ultimately reaches the community-based transmitters/receivers, erected by the electric power company, which then transmit the information back to the company by any of a variety of methods. The intense level of communication employed by this Mesh Network results in 10,000 bursts of RF radiation per day from each meter (on average) and up to 190,000 bursts of RF radiation per day (at a maximum) from each meter.³

³ Pacific Gas and Electric Company's Response to Administrative Law Judge's October 18, 2011 Ruling Directing it to File Clarifying Radio Frequency Information, page 5. (http://emfsafety.network.org/wp-content/uploads/2011/11/PGERFDataOpt-outalternatives_11-1-11-3pm.pdf)

Because of this intense level of communication, the number of bursts of RF radiation blanketing an entire community equipped with Smart Meters can reach tens of millions to hundreds of millions of bursts per day. That does not count the bursts of radiation sent throughout the community by the community-based transmitters/receivers erected by the electric power company to communicate with the Smart Meters. I have not yet found any data on the Peak RF Power Output, or the Bursts of RF Radiation per Day, of such transmitters/receivers.

Levels of Peak RF Power Output

Four levels of Peak RF Power Output are referenced in this document:

- "Very Low" power means well below 1 milliwatt (mW) of Peak RF Power Output.
- "Low" power means 1 milliwatt (mW) of Peak RF Power Output.
- "Medium" power means 100 milliwatts (mW) of Peak RF Power Output.
- "High" power means 1000 milliwatts (mW), which is equivalent to 1 watt (W), of Peak RF Power Output.

Wired Methods of Communication

Some Smart Meters, and some AMR Meters, can be equipped to return information to the electric power company through wired communications systems. These systems employ no intentional radiators and thus do not raise health concerns associated with intentional RF radiation itself. They still employ digital electronics and switching power supplies, however, so they do still add to the level of unintentional RF radiation in the environment. Two types of wired communications systems are referenced in this document:

- The "Internet" can be used via wired technologies, such as coaxial cable and fiber-optic cable.
- "Telephone Landlines" can be employed that are based on copper wiring, coaxial cable, and fiber-optic cable.

Ranking Electricity Meters for Risk to Privacy and Cyber Security

Table 3 on page 12 addresses the same Meter Categories and the same Types of Communication that are addressed in Table 2 with regard to Risk to Health. But Table 3 addresses the Risk to Privacy and the Risk to Cyber Security. However, for purposes of easy comparison, the overall findings for Risk to Health from Table 2 are carried forward and placed in the Overall Risk column on the right side of on Table 3.

Table 3: Ranking Electricity Meters for Risk to Privacy and Cyber Security

(RED means risk to Health. BLUE means risk to Privacy. GREEN means risk to Cyber Security.)

Meter Category	Type of Communication		Risk to Privacy				Risk to Cyber Security			Overall Risk		
			Remote Access to Data Stream		Nature of Data		Remote Access to Meter		Vulnerability of Meter to Being Harmed or to Doing Harm	Risk to Health	Risk to Privacy	Risk to Cyber Security
			Number of People with Potential Remote Access	Ease of Gaining Remote Access	Time-liness	Granu-larity	Variety	Number of People with Potential Remote Access	Ease of Gaining Remote Access			
SMART METER Digital Advanced Metering Infrastructure (AMI)	Criteria for Ranking → wireless wired	WAN/HAN	✓					4	5	5	5	5
		Internet cable/fiber		✓				5	2	5	5	4
		Telephone landline		✓				1	1	5	5	3
		Bubble Up	✓					3	5	5	2	4
Digital Automated Meter Reading (AMR)		Wake Up	✓					2	5	1	2	5
		Internet cable/fiber		✓				5	2	5	2	5
		Telephone landline		✓				1	1	1	2	1
		None								1	1	2
Basic Digital Electronic Meter												
Analog Meter (plus wireless digital electronics)		Bubble Up	✓					3	5	5	2	3
		Wake Up	✓					2	5	1	1	2
Traditional Analog Meter												

Criteria for All Rankings

There are many characteristics of each electricity meter that affect the risk that it poses to health, to privacy, and to cyber security. Unfortunately, information is not publically available for many of those characteristics. The characteristics for which some information is available, and which I have selected for use here, are shown in the column headings in Table 3.

Legitimate disagreement about the risk rankings is entirely understandable if only because there are many different configurations possible for even a single model of an electricity meter, and because individual judgment has to be exercised to produce any risk rankings. Even so, my hope is that the overall rankings presented here will be useful to identify at least:

- the type of meter that presents the highest risk
- the type of meter that presents the lowest risk
- the types of meters that fall in between, even if there is disagreement about the relative rankings of those in between.

Here are the criteria that I have used for ranking risk in each of the three risk categories:

Risk to Health

Risk to Health is higher when the RF radiation exposure produced is higher. And the RF radiation exposure is higher when the Peak RF Power Output is higher, and when the number of bursts of RF radiation per day is higher, other factors being equal.

Peak RF Power Output

Risk ↑	High Peak RF Power Output (1 watt)
	Medium Peak RF Power Output (100 milliwatts)
	Low Peak RF Power Output (1 milliwatts)
	no RF Power Output

When the Peak RF Power Output was unknown, as it was for Digital Electronics and Switching Power Supply in Table 2 on page 6, I made an educated, but qualitative, guess, specifically very low" and marked that entry "unknown".

Number of Bursts of Radiation per Day

Risk ↑	High number of bursts of RF radiation per day (more than 10,000 per day)
	Medium number of bursts of RF radiation per day (There were no meters in this group, so I did not define a specific level.)
	Low number of bursts of RF radiation per day (8 per month)
	No burst of radiation, ever

When the number of bursts of radiation per day was unknown, as it was for the Home Area Network (HAN) in Table 2 on page 6, I made an educated, but qualitative, guess of "high" and marked the entry "unknown".

Number of People Exposed to Radiation

The Risk to Health is also increased, in a societal sense, when more people are exposed to the radiation. The number of people that are exposed to the radiation is greater when the Peak RF Output Power is higher, because the size of the region exposed to the radiation increases, encompassing more people. So the Peak RF Output Power plays at least two roles in risk, increasing both the risk to each individual, and the number of individuals at risk. Thus, the heading "Number of People Exposed to Radiation" does not appear explicitly in Table 2 on page 6.

Risk ↑	Largest number of people is reached with High Peak RF Power Output (1000 milliwatts).
	Medium number of people is reached with Medium Peak RF Power Output (100 milliwatts).
	Smallest number of people is reached with Low Peak RF Power Output (1 milliwatt).
	No people are reached with zero Peak RF Power Output.

Risk to Privacy

The criteria that affect the risk to privacy are different for different "audiences" for the data. By the audience I mean the people who are obtaining and exploring the data and thus invading someone's privacy. Here, I consider two different audiences:

- people outside of the electric power company
- the electric power company itself.

For people outside of the electric power company, the risk to privacy can be viewed as dependent on two categories of criteria:

- remote access to the data stream
 - nature of the data.
- But for the electric power company, which has full access to all of the data produced by its electricity meters, access is not an issue. Therefore, only the nature of the data is relevant here.

considered what the electric power company might do with the data that it gathers, such as provide it to others outside the electric power company, which is an acknowledged public concern. That is an unknown that I could not see how to score here. But if this should occur, it would clearly be a monumental concern.

Table 3 on page 12 can be used to assess the risk to privacy from both audiences because the criteria have been separated into the two major categories just described. However, the overall "Risk to Privacy", as reported on the right side of that table, is reflective of both categories and thus assumes that the audience is the people outside of the electric power company. Inspecting the risk rankings under Nature of the Data" alone, the overall "Risk to Privacy" from the electric power company can be seen to be equally as high, or higher, than that from the people outside the electric power company.

Remote Access to the Data Stream

The risk to privacy increases with the number of people who can potentially gain access, and with the ease with which those people can actually gain access to that data stream. By access to the data stream, I mean access through the system of which the meter is a part, not access obtained by physically cutting into a wire, a cable, or a fiber.

Number of People with Potential Remote Access to the Data Stream

Risk ↑	Wired Internet data stream (both cable and fiber optic) provides the largest number of people with potential for remote access to data stream.
	Wireless data stream provides an intermediate number of people with potential for remote access to data stream.
	Wired telephone landline provides the smallest number of people with potential for remote access to data stream.
	none

When "none" applies there is no risk to privacy, no matter how the other criteria related to privacy are ranked. This case occurs for the Traditional Analog Mechanical Meter with No Wireless Communications Capability, and for the Basic Digital Electronic Meter.

Ease of Gaining Remote Access to the Data Stream

The risk to privacy also increases with the ease with which the people with potential remote access can actually gain access to the data stream.

Risk ↑	Wireless data stream is the easiest to which to gain remote access because it travels through the air.
	Wired Internet data stream (cable or fiber optic) is less easy to which to gain remote access.
	Wired telephone landline is the least easy to which to gain remote access.
	no remote data stream to access

When there is no remote data stream to access, there is no risk to privacy, no matter how the other criteria related to privacy are ranked. This case applies only for the Traditional Analog Mechanical Meter with No Wireless Communications Capability, and for the Basic Digital Electronic Meter, both of which have no wireless or wired communications capability.

Nature of the Data

The characteristics of the data affect the degree to which it is useful for invading privacy.

Timeliness

Data that are more timely are more likely to be useful for invading privacy.

Risk ↑	Timely data are more useful for invasion of privacy.
	Old data are less useful for invasion of privacy.

Granularity

Data that are more highly time resolved (more granular) are more likely to be useful for invading privacy.

Risk ↑	Highly granular (highly time-resolved) data are more useful for invasion of privacy.
	Less granular (less time-resolved) data are less useful for invasion of privacy.

Variety

Higher numbers of types of data are more likely to be useful for invading privacy.

Risk ↑	More data types are more useful for invasion of privacy.
	Fewer data types are less useful for invasion of privacy.

Risk to Cyber Security

Note that I use the phrase "cyber security" in a very limited sense in this document. The phrase refers to the security of the meter from external signals

- that can disrupt the meter itself (such as, by changing its readings or by changing its internal programming)
- that can cause the meter to do damage outside of itself (such as, by shutting down all power to the customer).

I have not considered cyber security in the sense that the meter might serve as a gateway to the network of which the meter is a part, and do damage through that network. Whether that is possible is beyond my knowledge. Certainly, if that is possible, that would be a monumental concern.

Nor have I considered cyber security in the sense that the community-based transmitters/receivers of the electric power company might serve as gateways to the network. Again, that is beyond my knowledge. If possible, that would also be a monumental concern.

Number of People with Potential Remote Access to the Meter

The risk to cyber security increases with the number of people who have potential remote access to the meter.

Risk ↑	Wired Internet data stream (both cable and fiber optic) provides the largest number of people with potential remote access to the meter.
	Wireless data stream provides an intermediate number of people with potential for remote access to the meter.
	Wired telephone landline provides the smallest number of people with potential for remote access to the meter.
	none

When "none" applies there is no risk to cyber security, no matter how the other criteria related to cyber security are ranked. This case occurs only for the Traditional Analog Mechanical Meter with No Wireless Communications Capability, and for the Basic Digital Electronic Meter.

Ease of Gaining Remote Access to the Meter

The risk to cyber security increases with the ease of gaining access to the meter remotely.

Risk ↑	Meter with wireless communications is the easiest to access remotely because all signals travel through the air.
	Meter with wired Internet communications (cable or fiber optic) is less easy to access remotely.
	Meter with wired telephone landline communications is the least easy to access remotely.
	Meter with no means of remote access.

When there is "no means" of remote access, there is no risk to cyber security, no matter how the other criteria related to cyber security are ranked. This case applies only for the Traditional Analog Mechanical Meter with No Wireless Communications Capability, and for the Basic Digital Electronic Meter, both of which have no wireless or wired communications capability.

Vulnerability of Meter to Being Harmed or to Doing Harm

The risk to cyber security increases with the vulnerability of the meter to being harmed or to doing harm.

Risk ↑	Meter has an internal shutdown switch. (That switch is always remotely controllable whenever present.)
	Meter has no internal shutdown switch.
	Meter can be accessed but has no ability to act on incoming signals.
Risk ↑	Meter has internal software that can be remotely reprogrammed.
	Meter has no internal software, or has internal software that cannot be remotely reprogrammed.
	Meter can be accessed but has no ability to act on incoming signals.

If the meter cannot act on incoming signals, it is not vulnerable in the sense meant here. Several of the meters addressed in this document appear to be invulnerable, in this sense, as shown in Table 3 on page 12.

Limitations to this Analysis

There are many limitations to this analysis:

- The variety of electricity meters available is so great that not all of them could be addressed here.
 - That variety is increased by the availability of hardware options and software programmability for some of the meters.
 - Some of the hardware options can be implemented not only by the manufacturers of the meters, but also by the electric power companies, both before installation and after installation.
 - Some of the software programmable capabilities can be exercised not only before installation but also after installation, and even remotely after installation and thus invisibly to the customer.

- The risk presented by a given meter is highly dependent on the options included in it. So the generalizations made here for a given category of meters may apply to a greater or a lesser degree depending on those options.
- New meters are being created all the time.
- It is impossible to obtain all of the information pertinent to assessing the risk of a given meter to health, privacy, and cyber security, for several reasons:
 - Some of the information needed is regarded as confidential or proprietary
 - by the manufacturers of the meters
 - by the testing laboratories that prove the compliance of the meters with the regulations of the Federal Communications Commission
 - by the electric power companies that buy and install the meters for their customers.
 - Some manufacturers and electric power companies decline to provide information about the meters, even if that information is not formally considered confidential or proprietary. No reason is usually given.
 - Some of the information needed may never have been generated.
 - Even for information that exists, there may be no legal requirement for that information to be revealed to the public, short of a court order. Such a court order has been employed in at least one instance, and provided vital information about Wireless Smart Meters that it had not been possible to locate previously.⁴

⁴ Pacific Gas and Electric Company's Response to Administrative Law Judge's October 18, 2011 Ruling Directing it to File Clarifying Radio Frequency Information, page 5.
 (http://emfsafetynetwork.org/wp-content/uploads/2011/11/PGERFDataOpt-outAlternatives_11-1-11-3pm.pdf)

Closing

In spite of the limitations to this analysis, I hope that this document gets close enough to capturing the principal distinctions among the many types of meters addressed here to provide some useful perspective on their relative risk. Perhaps this document will motivate those who know more about the meters than I do to develop their own ranking.

Supporting Document 06 of 07 - PA PUC Formal Complaint

"A Message to the Maryland General Assembly - The Health Argument for Replacing Wireless Smart Meters with a Safe Metering Technology in Maryland", by Ronald Powell, Ph.D.

[<https://www.scribd.com/document/289787721/The-Health-Argument-for-Replacing-Wireless-Smart-Meters-with-a-Safe-Metering-Technology-in-Maryland>]

December 4, 2014 Ronald M. Powell, Ph.D.

A Message to the Maryland General Assembly The Health Argument for Replacing Wireless Smart Meters with a Safe Metering Technology in Maryland

The electric power companies of Maryland made a dreadful mistake when they elected to install Wireless Smart Meters to measure electrical power. Wherever these meters are installed, they threaten the health of all residents in the community, violate their privacy, increase the cyber vulnerability of the supply of electricity to their homes, decrease their personal security and safety, and threaten property values in the community. And Wireless Smart Meters do all of this without any persuasive evidence of a financial benefit to the customers commensurate with the cost of the Wireless Smart Meter system.

All of these consequences are important for Marylanders; but the health threat is particularly tragic. If you care about the health of Marylanders, including the health of your own family, and about the cost of health care in Maryland, do consider the information presented here and the many supporting references cited. This document describes the health problems that the biomedical research community has found caused by exposure to the type of radiation – radiofrequency radiation (at microwave frequencies) – emitted by Wireless Smart Meters.

RECEIVED

OCT 3 2016

Who am I?

I am a retired U.S. Government scientist (Ph.D., Applied Physics, Harvard University, 1975). During my Government career, I worked for the Executive Office of the President, the National Science Foundation, and the National Institute of Standards and Technology. For those organizations, respectively, I addressed Federal R&D program evaluation, energy policy research, and measurement development in support of the electronics and electrical-equipment industries and the biomedical research community. I currently interact with other scientists and with doctors around the nation on the impact of the environment – including the radiofrequency environment – on human health.

What is the health problem with Wireless Smart Meters?

Wireless Smart Meters transmit radiofrequency (RF) radiation to transfer data about electric power consumption back to the electric power companies, to communicate with other Wireless Smart Meters, and, soon, to communicate with Wireless Smart Appliances inside each home. The installation of these Wireless Smart Meters was undertaken in spite of the fact that the international biomedical research community, and medical practitioners, are increasingly finding that a wide variety of biological effects are being caused by RF radiation at levels much lower than earlier understood, and well below the levels produced by Wireless Smart Meters.

The RF radiation from Wireless Smart Meters is particularly threatening to health because that radiation is so persistent and so powerful. California court documents, describing the same Wireless Smart Meters used here in Maryland, indicate that each of these meters issues its pulses of RF radiation, on average 10,000 times per day, and up to a maximum 190,000 times per day, 24/7, forever. Further, the power level of each pulse is about 1000 milliwatts, placing Wireless Smart Meters among the most powerful RF radiators likely to be present in a residential environment.

References:

http://emfsafetynetwork.org/wp-content/uploads/2011/11/PGERFDataOpt-outalternatives_11-1-11-3pm.pdf

<http://stopsmartmeters.org/wp-content/uploads/2012/01/OWS-NIC514-FCC-specifications.pdf>

Why don't Federal regulations protect the public from such high levels of RF radiation?

The Federal Communications Commission (FCC) is responsible for the regulations that set the Maximum Permitted Exposure (MPE) limits for RF radiation. Unfortunately, the current regulations are based primarily on outdated 1980s thinking, when only the heating effects of RF radiation on the body were considered. Since then, the biomedical research community has demonstrated, in hundreds of published studies, that there are an enormous number of biological effects of concern, entirely aside from heating. And the number of discovered effects continues to grow.

In short, current FCC regulations are entirely out of date and are too permissive to protect the public from harm. This problem has been recognized in legislation proposed in the U.S. House of Representatives (H.R. 6358). But, even if that legislation becomes law, it will be years before more protective regulations are developed and issued. In the meantime, each of the states in the USA is on its own to protect its residents.

[Thus, the question is: Will Pennsylvania act to protect its residents?]

References:

Summary of H.R. 6358:

(<http://marylandsmartmeterawareness.org/smart-meter-news/ask-your-congressional-rep-to-co-sponsor-h-r-6358>).

Full copy of H.R. 6358:

(http://thomas.loc.gov/home/gpoxmlc112/h6358_1h.xml).

What biological effects does exposure to RF radiation cause?

Some of the biological effects of exposure to RF radiation can be readily sensed (the "symptoms"). Other biological effects cannot be readily sensed, at least not until an advanced state of harm has been reached. Unfortunately, you can be harmed by the latter even when you are free of the "symptoms".

[That is, you can be harmed with no warning.]

(1) Biological effects of RF radiation from Wireless Smart Meters that can be sensed (the "symptoms") include these:

- pressure in head
- difficulty concentrating
- ringing, buzzing/tinnitus in the ears
- insomnia
- headaches
- heart racing, arrhythmia
- memory problems
- agitation
- dizziness
- tingling, burning skin
- fatigue
- involuntary muscle contractions
- eye/vision problems
- numbness

Reference:

Pre-Filed Testimony of Richard Conrad, Ph.D., Appendices 2 and 3

(<http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2013/01/Exhibit-9-Conrad-Web.pdf>).

(2) Biological effects of RF radiation that cannot be readily sensed (except for some on the first line below), until they have reached an advanced state of harm, include these:

- sleep, neuron firing rate, EEG, memory, learning, and behavior difficulties
- stress proteins, heat shock proteins, and disrupted immune function
- reproduction and fertility effects
- brain tumors and blood-brain barrier penetration
- cancer (other than brain) and cell proliferation
- oxidative damage, reactive oxygen species and DNA damage, and DNA repair failure
- disrupted calcium metabolism
- cardiac, heart muscle, blood pressure, and vascular effects

Reference:

BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors, BioInitiative Report: A Rationale for Biologically-based Public Exposure Standards for Electromagnetic Radiation, December 31, 2012 (<http://www.bioinitiative.org>) . See the RF Color Charts.

Where can you find analyses of the research literature documenting the biological effects of RF radiation?

The published literature of the international biomedical research community on the adverse effects of RF radiation is so vast that it would be difficult to read it all. But three very wide ranging reviews of this literature have made the findings more accessible:

(1) The most massive review is the 1479-page BioInitiative 2012 Report, published in December 2012, which considered about 1800 biomedical research publications issued in the last five years. The BioInitiative 2012 Report was prepared by an international body of 29 experts, heavy in Ph.D.s and M.D.s, from 10 countries, including the USA which contributed the largest contingent of experts (10).

Reference:

BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors, BioInitiative Report: A Rationale for Biologically-based Public Exposure Standards for Electromagnetic Radiation, December 31, 2012 (<http://www.bioinitiative.org>).

(2) A group of six doctors in Oregon, led by Paul Dart, M.D., published, in June 2013, their own 74-page review of 279 biomedical research publications. This review makes the health case against the installation of Wireless Smart Meters, explicitly. The review recommends that levels of RF radiation must be lowered to protect public health, not raised by the installation of Wireless Smart Meters. This review is posted on the website of the Federal Communications Commission, at the link entitled "Health Effects of RF - Research Review (97)".

Reference:

Biological and Health Effects of Microwave Radio Frequency Transmissions, A Review of the Research Literature, A Report to the Staff and Directors of the Eugene Water and Electric Board, June 4, 2013 (<http://apps.fcc.gov/ecfs/comment/view?id=6017465430>).

(3) Michael Bevington, in 2013, published a book that summarizes the findings of 1828 biomedical research publications. The book describes the symptoms caused by exposure to electromagnetic radiation, the many diseases associated with such exposure, and the relative risk levels associated with specific sources of electromagnetic radiation. Wireless Smart Meters are in the highest of those risk categories.

Reference:

Michael Bevington, Electromagnetic Sensitivity and Electromagnetic Hypersensitivity: A Summary, 2013 (<http://www.es-uk.info>).

Are some groups of people at especially high risk of harm from RF radiation?

Yes. The above literature reviews indicate that some groups of individuals are at especially high risk of harm from exposure to RF radiation: pregnant women and their unborn children, very young children, teenagers, men of reproductive age, seniors, and anyone with a chronic health condition.

What is the latest disquieting information about the biological effects of RF radiation?

As the research community's investigations proceed, additional biological effects are being found and others are coming under investigation. One of the most important coming under investigation now is the plausibility of a link between RF radiation and autism. A link is suspected because the biological effects known to be caused by RF radiation are remarkably similar to the biological anomalies exhibited by autistic children.

That link has not yet been scientifically established. But if that link does prove true, and thus that RF radiation is found to be one of the environmental stressors contributing to autism, then we may, at last, have an explanation as to why the incidence of autism is growing as quickly as the use of wireless devices themselves. Autism now affects 1 in about 50 children, mostly boys.

Reference:

Martha R. Herbert, Cindy Sage, Autism and EMF? Plausibility of a pathophysiological link part I and part II, Pathophysiology, Volume 20(3), pages 191-209 and 211-34, June 2013 (<http://www.pathophysiologyjournal.com/article/S0928-4680%2813%2900037-0/abstract>).

What are medical associations saying about RF radiation from Wireless Smart Meters and other wireless devices?

The American Academy of Environmental Medicine, which trains medical doctors in preparation for the tests required for Board Certification in Environmental Medicine, recommends:

"Avoidance of smart meter EMF/RF emissions based on health considerations, including the option to maintain analog meters."

"A moratorium on smart meters and implementation of safer technology."

Reference:

AAEM, "Smart Meter Case Series", October 23, 2013 (<http://marylandsmartmeterawareness.org/wp-content/uploads/2014/02/AAEM-Smart-Meters.pdf>).

The American Academy of Environmental Medicine also states:

"The AAEM strongly supports the use of wired Internet connections, thereby encouraging prudent minimization of exposure to RF such as from WiFi, cellular and mobile phones and towers, and "smart meters."

"The peer reviewed, scientific literature demonstrates the correlation between RF exposure and neurological, cardiac, and pulmonary disease as well as reproductive and developmental disorders, immune dysfunction, cancer and other health conditions. The evidence is irrefutable."

Reference:

AAEM, "Wireless Radiofrequency Radiation in Schools", November 14, 2013
(<http://aaemonline.org/docs/WiredSchools.pdf>).

The American Academy of Pediatrics (AAP), whose 60,000 doctors care for our children, has supported the development of more restrictive standards for RF exposure that would better protect the public:

"It is essential that any new standards for cell phones or other wireless devices be based on protecting the youngest and most vulnerable populations to ensure they are safeguarded through their lifetimes."

Reference:

Letter from the AAP to the Honorable Dennis Kucinich, U.S. House of Representatives,
December 12, 2012 (<http://www.scribd.com/doc/118348085/AAP-Supports-Child-Cell-Phone-Protection>).

How are other states and communities responding to Wireless Smart Meters?

In California, which got Wireless Smart Meters early (2010), 57 towns, cities, counties, and other jurisdictions have opposed the mandatory installation of Wireless Smart Meters. Of these jurisdictions, 15 have banned the installation of Wireless Smart Meters altogether.

Reference:

<http://stopsmartmeters.org/how-you-can-stop-smart-meters/sample-letter-to-local-government/ca-local-governments-on-board/>

The Attorneys General of three states have opposed Wireless Smart Meters because they find that the costs outweigh any claimed financial benefits to the customers.

The Attorney General of Illinois, Lisa Madigan, indicates the following:

"The utilities want to experiment with expensive and unproven smart grid technology, yet all the risk for this experiment will lie with consumers."

"Consumers don't need to be forced to pay billions for so-called smart technology to know how to reduce their utility bills. We know to turn down the heat or air conditioning and shut off the lights. The utilities have shown no evidence of billions of dollars in benefits to consumers from these new meters, but they have shown they know how to profit. I think the only real question is: How dumb do they think we are?"

Reference:

<http://www.lisamadigan.org/Newsroom/lisainthenews/item/2011-06-lisa-madigan-opinion-editorial-come-d-experiment-too>

The Attorney General of Connecticut, George Jepsen, concluded the following:

"Connecticut Light & Power Co.'s plan to replace existing electric meters with advanced technology [that is, Wireless Smart Meters] would be very expensive and would not save enough electricity for its 1.2 million customers to justify the expense, Attorney General George Jepsen said Tuesday."

"The pilot results showed no beneficial impact on total energy usage," Jepsen said. "And, the savings that were seen in the pilot were limited to certain types of customers and would be far outweighed by the cost of installing the new meter systems," he said."

Reference:

(http://www.ct.gov/aq/lib/aq/press_releases/2011/020811clpmeters.pdf)

The Attorney General of Michigan, Bill Schuette, stated the following:

"A net economic benefit to electric utility ratepayers from Detroit Edison's and Consumers smart meter programs has yet to be established. In the absence of such demonstrated benefit, the Attorney General has opposed, and will oppose any Commission action that unjustly and unreasonably imposes the costs of such programs upon ratepayers."

Reference:

<http://efile.mpsc.state.mi.us/efile/docs/17000/0408.pdf>

Throughout the USA, 33 of the 50 states now have Wireless Smart Meter opposition groups, providing strong evidence of growing public awareness and concern. [Including Pennsylvania]

Reference:

<http://www.takebackyourpower.net/directory/us/>

Left unattended, will the health problem posed by Wireless Smart Meters get better or worse?

The health problem will get much worse and quickly. Wireless Smart Appliances, such as smart electric stoves, and smart electric clothes dryers, are in the offing. They, too, will contain wireless RF transmitters and receivers. These Wireless Smart Appliances are designed to use RF radiation to communicate with Wireless Smart Meters so that the electric power company will know what each Wireless Smart Appliance in every home is doing all the time. Thus, not only will the Wireless Smart Meters be sending RF radiation into the home to probe for data from the Wireless Smart Appliances, but also the Wireless Smart Appliances will be responding by sending their own RF radiation throughout the home. The result will be a steadily increasing level of RF radiation in the home, further increasing the health risk.

Why is there a special urgency to this problem?

While some of the biological effects of RF exposure can be reversed by reducing exposure, a quick examination of the lists of biological effects above will indicate that many of these effects are not reversible. For example, once you have cancer, reducing RF exposure may not be sufficient to enable recovery, even though it may help with recovery. Simply stated, the longer that RF exposure at high levels is permitted to persist, the more difficult it will become to undo the harm. Many Marylanders have already been exposed to the RF radiation from Wireless Smart Meters for more than one year. Why are Wireless Smart Meters a community issue, not just an individual issue?

The RF radiation from each Wireless Smart Meter does not stop at the boundaries of the property on which that Wireless Smart Meter has been installed. Also, the radiation readily penetrates ordinary home-construction materials. If this were not true, Wireless Smart Meters would be of no use to the electric power companies for returning consumption data to them or for communicating with forthcoming Wireless Smart Appliances inside the home.

In fact, every resident in a community is irradiated by every Wireless Smart Meter in that community, just to varying degrees. Each Wireless Smart Meter near to a given resident produces more radiation in his home than each Wireless Smart Meter farther away. But there are so many more Wireless Smart Meters that are farther away that, together, they count, too. For example, in my community of Montgomery Village, MD, there are more than 14,000 Wireless Smart Meters installed on our homes. Together, they issue an average of 140 million pulses of RF radiation every day, up to a maximum of 2.7 billion pulses per day. There is now no place in our community where a resident can go where he is not near to many Wireless Smart Meters and within reach of so many more Wireless Smart Meters that are farther away.

The implication is that no resident can solve his radiation problem just by having his own Wireless Smart Meter replaced with a safe meter, even though his own Wireless Smart Meter is the single greatest contributor to the radiation level in parts of his home. Rather, all of his neighbors must have their Wireless Smart Meters replaced, too. This fact is already stressing relationships among neighbors who have varying degrees of understanding of the health threat. If Wireless Smart Meters are allowed to continue in use, this stress can tear communities apart.

In short, once Wireless Smart Meters have been installed on your home and in your community, your home is no longer your castle. Rather, your home is now your electric power company's castle.

How can the Maryland General Assembly help through legislation?

[So, what is Pennsylvania going to do? Are Pennsylvania residents any less valued than Maryland residents?]

(1) If you want to provide SOME help to SOME Maryland residents, then at least:

Write into law a permanent permission for individual ratepayers to opt out of having any type of wireless meter, including a Wireless Smart Meter, and without fees. No one should have a wireless meter imposed upon him. Nor should anyone have to pay a penalty to protect the health of his family and his community. Specifically, grant ratepayers the right to have a safe meter, including especially the safest meter of all which is the "traditional analog mechanical meter with no wireless communications capability". This type of meter does not emit RF radiation at all. And this type of meter also has a long history of reliability and accuracy.

(2) If you want to provide SOME help but to MORE Maryland residents:

Extend to all renters, including those renting office space, the same rights extended to ratepayers in (1) above. Otherwise, their health will remain at the mercy of their landlords, who may not understand, or care, about the health risks to their renters.

(3) If you want to SOLVE the health problem for ALL Maryland residents equally:

Place a moratorium on the further installation of wireless meters, including Wireless Smart Meters, throughout Maryland. Then mandate a rollback of the installation of all wireless meters, including all Wireless Smart Meters, throughout the state. Specifically, grant homes and businesses the right to have a safe meter, including especially the "traditional analog mechanical meter with no wireless communications capability". That is the only way to protect all of the residents of the state, because each resident is irradiated not only by his own Wireless Smart Meter but also by the Wireless Smart Meters of his neighbors. Finally, right at least part of the wrong done to those who have opted out by ordering the refunding of all Opt Out fees that they have paid.

If I can be of assistance to you or your staff in assessing the documentation justifying such steps, please do not hesitate to contact me.

I urge you to look deeply into this major challenge to the health of all Marylanders. Only you can prevent the dreadful mistake made by the electric power companies from becoming a health disaster for all Maryland residents. Please take protective action now.

Thank you for your attention.

Regards,

Ronald M. Powell, Ph.D.

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E-mail: ronpowell@verizon.net Tel: (301) 926-7568

Supporting Document 07 of 07 - PA PUC Formal Complaint

How Dangerous and Expensive Became "Smart" An Exposé of the "Smart Grid", by Amy Worthington, of westonaprice.org.

II Smart Meters—not so Smart

Amy Worthington

1/19/2015

How Dangerous and Expensive Became "Smart" An Exposé of the "Smart Grid"

Electric "smart" meters were installed in Cindy deBac's Scottsdale, Arizona, neighborhood in 2012. She recalls the day a new meter was mounted on her home as a sort of digital Pearl Harbor attack. "I've never been so sick in my life," she says. "Nausea, a crushing migraine headache, and painful heart palpitations laid me low right away."

Healthy and exuberant before the installation, deBac became unable to sleep normally. She soon became exhausted and tearfully anxious as she struggled with rashes and a chronically racing heart. For respite she spent nights away in her car. One of her dogs died of cancer within six months of the meter's installation and the other developed large tumors. Today Cindy leads a global educational crusade to warn others about the myriad devastating health effects that electromagnetic radiation can unleash.

Across the U.S. installers continue to replace comparatively safe analog (mechanical) utility meters with digital "smart" meters for electrical, gas and water services. Most of the new meters are wireless two-way transmitters that pulse signals to communicate continuously between your home, school, or workplace and utility companies miles away. The new meters are part of a nationwide project dubbed Advanced Metering Infrastructure (AMI). Most folks call this evolving make-over the "smart grid."

The AMI "smart" meter below records electrical consumption data and sends the information wirelessly to energy system managers. "Smart" meters can be programmed to read and transmit data monthly, or up to every fifteen seconds. Data may be relayed by systems similar to mobile phones or Wi-Fi. Or information may be relayed via fiber optics (thin, transparent cables that carry signals by pulsing light). Of these methods, fiber optics may offer the safest transmission.

AMI is nested within the American Recovery and Investment Act of 2009, and the Obama Administration has shoveled an estimated eleven billion dollars into incentive programs for utilities that participate. "Smart" grid advocates insist that the new two-way meters will reduce national energy consumption and allow consumers to make better choices about their energy needs.

The Department of Energy (DOE) and the U.S. Department of Agriculture (USDA) are among federal heavyweights behind the thundering AMI rollout. Several universities and corporations stand to profit hugely by providing AMI equipment, software and expertise. These include General Electric, IBM, Hewlett Packard, Siemens, Toshiba, Microsoft, Cisco, Verizon, Google, Itron and Tantalus.

With a financial and political engine of this magnitude, the AMI meter replacement project has moved at lightning speed. According to the Institute for Electric Efficiency (IEE), nearly 40 percent of U.S. households had an electric "smart" meter installed by August 2013. A total of sixty-five million "smart" meters are projected to be installed by 2015, covering more than half of all U.S. households.¹ Among states hit hardest so far have been Oregon, Idaho, California, Nevada, Arizona, Texas, Oklahoma, Maryland, Virginia, Indiana, Ohio, Pennsylvania, Michigan, Vermont, Florida, Georgia and Alabama.

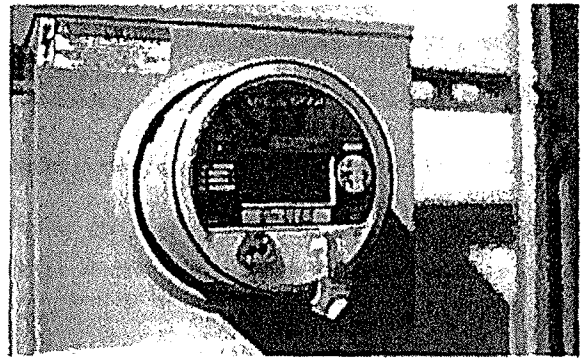
PRELIMINARY REPORTS ON "SMART" METERS

Over the last three years, strong-arm installation tactics, fires caused by meters, skyrocketing utility bills, privacy concerns and disabling health effects have given momentum to a broad coalition of "smart" grid opponents. Many, including some government officials, say that the touted benefits of "smart" systems have not materialized, while the

negative ramifications have proven disastrous.

AMI "SMART" METER

The American Academy of Environmental Medicine (AAEM) has proposed a moratorium on "smart" meters as an "issue of the highest importance." This international association of physicians and public health experts warns that it is unacceptable to implement radiation-emitting technology before serious medical and environmental concerns have been properly addressed.²



AMI is calibrated to expose all Americans to three new and powerful sources of microwave radiation: "smart" meters, "smart" appliances, and a ubiquitous network of antennas on utility poles and cell towers in urban and rural neighborhoods. Neither the federal government nor grid profiteers have undertaken a single public health study about the long-term health effects of exposure to electromagnetic radiation (EMR) from "smart" meters. Yet medical literature is now loaded with peer-reviewed studies about the non-thermal biological effects of exposure to EMR. Peer-reviewed studies report DNA damage, abnormal genetic and hormonal changes, sperm damage, pregnancy complications, weakening of the blood-brain barrier, disturbance of voltage-gated calcium channels (for example, in the heart), degradation of immunity, and certain types of cancers.³

Especially worrisome, says AAEM, is mounting evidence that inescapable electromagnetic fields exposure from smart meters places children at particular risk for altered brain development and for impaired learning and behavior. These concerns are corroborated by the blockbuster BioInitiative Report 2012. Produced by twenty-nine medical and public health experts from ten countries, the BioInitiative Report offers a meta-analysis of over eighteen hundred new scientific studies showing that chronic exposure to both ELF and microwaves poses a serious health hazard. At highest risk are the most vulnerable of our population: children, pregnant mothers, the elderly and the immunocompromised.⁴

Health ramifications aside, AMI technology is good for the corporate bottom line. "Smart" meters eliminate the need for human meter readers. They allow utilities to turn services on and off remotely. The meters identify consumption of a product and automatically send those data to headquarters for monitoring and billing. They allow water utility companies to monitor and control consumer usage closely. Because electricity is delivered most efficiently in an even, steady flow, "smart" grid enthusiasts aim to encourage residential customers to use less electricity during daytime working hours and more during evenings and weekends. Eventually, customers may be charged by time-of-use. "Smart" grid promoters claim that by 2030, the system will reduce nationwide electricity usage by about four percent.⁵

But at what price? The cost of the "smart" meter program is breathtaking. By some estimates, utility consumers will pay at least two hundred twenty-five billion dollars to blanket the nation with AMI meters. A "smart" electric meter can cost hundreds of dollars per household. The attorney general of Massachusetts projected the cost of each meter in that state at almost three thousand dollars.⁶ Some AMI equipment manufacturers suggest that meters may need to be replaced as often as every three years to keep up with technical innovations.⁷ This would force consumers to continually pay for new hardware that they are coerced to accept. Critics say that when time-of-use pricing goes into effect, utility bills could become insurmountable for many customers (unless they learn to direct their peak energy usage to the middle of the night).

CANARIES ON THE WEST COAST

Pacific Gas and Electric (PG&E) of California was among the first U.S. utilities to deploy AMI meters. Its 2010-2012 "smart" meter rollout caused a state-wide furor. Some older "smart" meter systems (AMR) send their data through

existing utility lines. A few newer AMI systems communicate through fiber optics. But like many other utility companies, PG&E has deployed a mesh networking system, which broadcasts pulsed radio frequency signals (microwaves) into homes and across outdoor spaces. PG&E's "smart" grid emits EMR from the meters and from a state-wide support network including:

- Thousands of new utility antenna communications towers and relay/repeater poles;
- Thousands of new mobile data base stations with fixed and mobile radios for utility workers;
- Thousands of crossband repeater stations, each broadcasting radiation in the 900 megahertz range;
- Thousands of broadband access points emitting the license-exempt Wi-Fi frequency bands of 2.45, 3.65, and 5.8 gigahertz;
- Thousands of point-to-point microwave links providing backhaul for the system;
- Thousands of integrated service routers handling security and network management through wireless signals.⁸

The new smart grid signal infrastructure is a duplication of the massive cellular communications build-out which, over the last thirty years, has spawned over three hundred thousand microwave towers and rooftop antenna arrays from coast to coast. There are at least a dozen published epidemiological studies reporting that populations living within five hundred meters of cellular microwave antennas suffer high rates of adverse health effects including headaches, skin rashes, vision/hearing problems, dizziness, sleep disturbances, hormonal abnormalities and chronic fatigue. There are also many reports of cancer clusters among people living near cell towers or in buildings directly under them.⁹

The "smart" grid network inflicts an incalculable increase in hazardous EMR at a time when the International Agency for Research on Cancer (IARC) has designated all RF/microwave electromagnetic frequencies as a Group 2B carcinogen (possibly cancer-causing).¹⁰

CANARY SICKNESS AND MEDIA FALLOUT

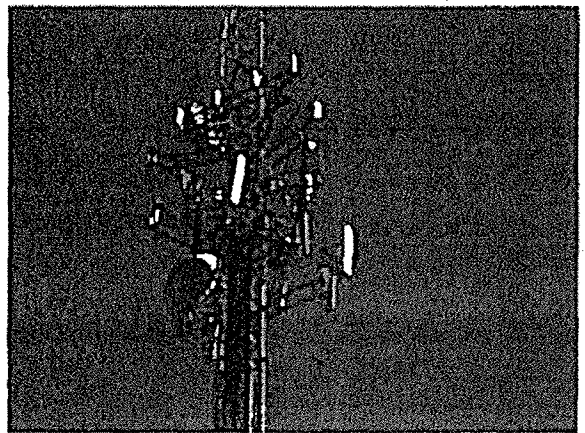
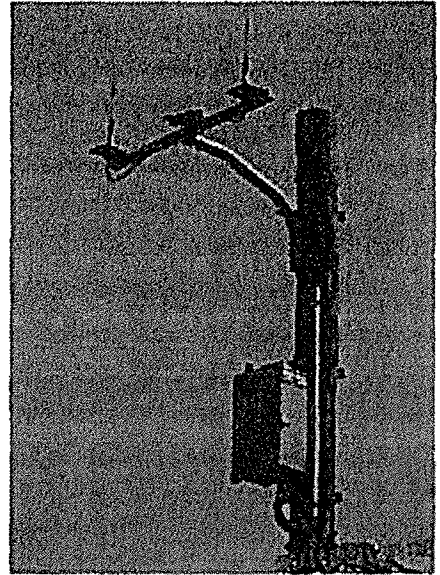
A group of concerned medical doctors in Eugene, Oregon, reports: "PG&E's approach to the AMI rollout didn't involve a lot of public education. They just switched out the meters. And some people found that they were having trouble sleeping, or experiencing headaches, ringing in the ears, vertigo or other symptoms that hadn't been bothering them before. Soon the Internet was awash with anecdotal reports and commentary about these adverse effects. . . . Finally PG&E was served with a court order to provide clearer documentation of what the meters were actually doing. In response to that court order, PG&E provided documentation from the manufacturer of the meters that the average meter in the mesh network transmitted data signals to the utility six times a day, network management signals fifteen times a day, timing signals three hundred sixty times a day and beacon signals to the mesh network nine thousand six hundred times a day....This penciled out to roughly seven transmissions per minute, twenty-four hours a day, coming out of every meter in the community."¹¹

Left: An EMR-emitting device attached to a telephone pole. Right: A cell tower.

Since microwaves easily flow through most construction materials, "smart" meters attached to the outside of homes (or huge banks of them on multi-unit dwellings) broadcast a perpetual barrage of Group 2B radiation directly into the interior of inhabited buildings and right through all human flesh within range.

In addition, some residents within AMI mesh networks may also have "Medusa" meters on their property. One investigator reports: "A utility whistle blower told us about a special smart meter—a mini cell phone tower. This collection device receives data and more radiation from five hundred to seven hundred surrounding meters and uses the customer's premises to serve as a relay station to transmit other neighbors' data along the mesh network to collection points. These Medusa meters are deployed upon properties without the owner's knowledge or consent. The utilities select a property for this meter based upon easy meter access to the street, no locked gates or dogs and good customer payment history. . . Utilities reward good customers with a Medusa meter and bathe their homes with additional toxic radiation."¹²

By early 2011, the California Public Utilities Commission had received over two thousand health complaints from PG&E customers and the complaints escalated from there. By the end of 2011, multiple California cities had either banned smart meters or had placed a moratorium on continued installation. Currently, many California communities are still in AMI limbo, while communities in other states also struggle to find their way.



THE PROBLEMS WITH EXPOSURE TO MAN-MADE EMR

"Smart" meters are "hot," in terms of broadcast power density, and can emit microwaves at levels many times higher than those reported by medical studies to cause serious adverse health effects. Film producer Josh del Sol reported in his documentary *Take Back Your Power* that testing shows a single "smart" meter can produce eight microwatts per centimeter squared (cm²). A bank of smart meters can generate up to 19.8 microwatts/cm² of whole-body radiation exposure. Meantime, modern medical science confirms that a microwave transmission power of only .05 microwatts/cm² can cause children to suffer headaches, behavioral problems and inability to learn and concentrate.¹³

In a study conducted by chiropractic physician Dr. Frank Springob, "smart" meter radiation exposure quickly produced almost instant blood abnormalities in human test subjects.¹⁴ Volunteers had their blood examined as normal, then stood within one foot of a transmitting "smart" meter for only two minutes. A post-exposure examination with dark field microscopy showed that all volunteers had developed one of these blood pathologies:

- Marked degradation of cells with some cell walls broken;
- Corrugated formation in which blood cells become crimped like bottle caps,

• A rouleaux condition in which the red blood cells clump abnormally together. Dietrich Klinghardt, MD, PhD, who practices medicine in Washington State, says, "It is our experience as doctors that everybody is equally electro-sensitive." Dr. Klinghardt finds the same inflammatory markers in the blood of every EMR-exposed person, both those who feel bad from exposure and those who notice no preliminary ill effects.¹⁵

"Smart" grid proponents routinely insist that the meters emit RF radiation at levels far below maximum exposure standards set by the Federal Communications Commission (FCC). FCC is the federal agency with sole authority to regulate wireless antennas. But environmental consultant Cindy Sage, co-editor of the BioInitiative Report, has determined that the emissions from "smart" meters installed across California likely exceed FCC's guidelines.¹⁶

Meanwhile, BioInitiative Report scientists recommend that the FCC reduce allowable emissions by thousands-fold in order to protect public health. Cindy Sage explains that EMR emitted by "smart" meters reaching the interior of a home can be comparable to radiation levels found within two hundred to six hundred feet of a cell tower. She warns: "If you think of a strobe light or a laser in the eyes, it is intermittent but powerfully disabling if you are forced to endure it. ["Smart" meter] signals may be short bursts of RF (this depends on the meter and how utilities choose to operate) but... it is a continual 24/7 battering of the body with cellular insults."¹⁷

THE PAY-US-NOT-TO-HURT-YOU RACKET

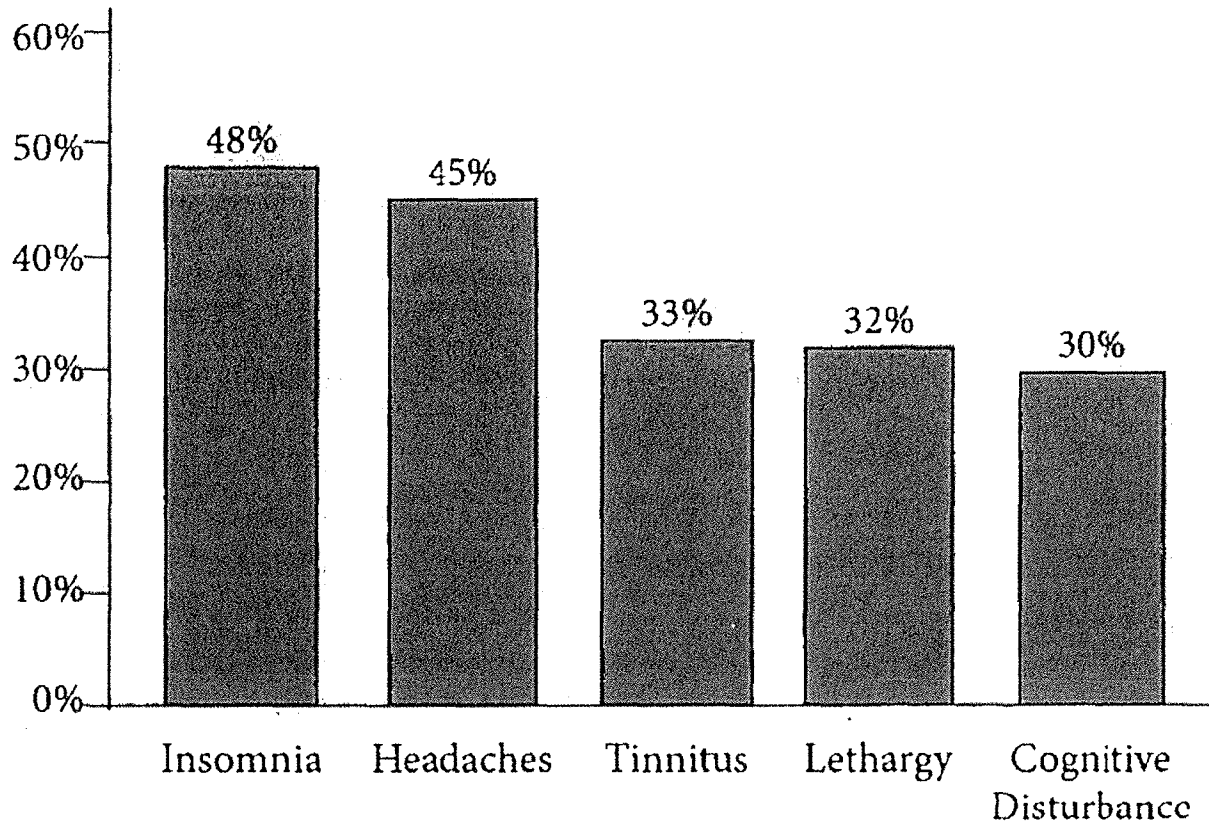
Due to public uproar, some utility companies unleashing "smart" meter systems are offering opt-out programs. Opt-out often requires those who refuse "smart" meters to pay one or more fees for the right to keep their older and safer analog meters. Some complain that the fees are reminiscent of extortion from old-time protection thugs.

Requesting an opt-out is definitely a first step to protecting one's own home from harmful, microwave emissions. But it does not address exposure to EMR from neighboring meters, or from mesh pole transmitters on the grid. EMR from some meters can be measured over three hundred feet away. A single-family home in a residential community can be well within three hundred feet of several near and next-nearest neighbors. Thus, even at the distance of a football field, EMR from many surrounding meters could prove biologically significant, even for those who retain their analog meters. Residents of townhouses, condos and apartment buildings may be especially vulnerable when ten or twenty meters or more are installed on one wall.

Also, an opt-out does not resolve the hazards of dirty electricity polluting a neighborhood loaded with AMI meters. Nor does it protect people who don't have enough information to request an opt-out, but who may one day develop illnesses from EMR exposure.

Living in rural areas does not solve the problem. Some rural utilities serving mountainous and/or forested areas may choose to deploy AMI metering solutions like those provided by Tantalus Systems Corp. Tantalus creates hybrid "smart" antenna systems, utilizing a variety of frequency signals that can travel through and around obstacles in their quest to "connect."¹⁸ As with other frequency fields deployed by AMI, no studies of the biological effects of such public exposure have been conducted.

Five Most Common Symptoms Observed in Smart Meter Case Study



Credit: Figure 2 of "Self-Reporting of Symptom Development from Exposure to Radiofrequency Fields of Wireless Smart Meters in Victoria, Australia: A Case Series." Altern Ther Health Med. 2014; 20(6): page 31.

BIG BROTHER IN THE CLOTHES DRYER

The smart meter roll-out is only the first phase of a federal master plan that will deeply penetrate American homes with smart radiation. Some appliance manufacturers are now gearing up to market antenna-embedded appliances capable of linking to the "smart" grid through the Internet. Such appliances can transmit and receive data to and from utilities. Such appliances make people vulnerable to hackers.¹⁹

Most upcoming smart appliances will be using the Wi-Fi frequencies of 2.4 or 5 GHz. They will create a wireless home access network (HAN) similar to residential Wi-Fi systems. Smart appliance HANs will broadcast microwave radiation 100 percent of the time. Within a typical house full of radiating appliances, there will be no location out of broadcast range. It is anticipated that smart appliance turn-off will be available only at the circuit breaker.

The EMF Safety Network says: "Smart meters are a surveillance device. They are a search without a warrant. They collect detailed energy usage, for instance when you cook, watch TV, whether you are at home or not, when you turn on a light or when you have guests. This data is valuable because it can reveal patterns about what you do and when. California utility companies admitted they are providing smart meter data to the government and third

parties."²⁰

Those with access to "smart" meter and "smart" appliance data, including government officials, law enforcement agents, and professional hackers/thieves, can review a permanent history of household activities, then complete a calendar with time-of-day metrics to gain a highly invasive and detailed view of occupants' lives. Because smart meters can individually identify electrical devices, personal information made obvious to snoopers can include medical conditions, sexual activities, the physical location of persons within the house, and vacancy patterns.

Even the new digitized "smart" water meters can transmit surveillance information. Describing such meters installed in Minnesota, one report notes: "If you stop using water for the night at 10 p.m. the city will know because they will get signals during the night of no water usage. If the city gets a signal at 2 a.m. for 1.5 gallons, the city knows you just flushed your toilet." For the privilege of involuntarily supplying such data to nameless overseers, the owner of the toilet must endure invasive and continuous exposure to electromagnetic radiation.²¹

A SYSTEM SMACKING OF HACKING

There is a smart grid initiative in almost every industrialized nation. The fact that AMI has been deployed worldwide makes the entire "smart" power grid especially vulnerable to cyber attacks. As AMI progresses, the vulnerability of the Internet is being transferred to entire national grids.

In January 2014, two large utility companies in Massachusetts, known collectively as Northeast Utilities, informed their state Department of Public Utilities that there is no cost justification for implementing a one billion dollar AMI system statewide. They said: "Many customers have a deep aversion to technology that links them to the grid in a way that they perceive as an invasion of their privacy and/or detrimental to their health." Northeast Utilities also complained: "AMI introduces a brand new portal into the companies' information systems, significantly increasing the cyber-security risk."²²

Former CIA director James Woolsey agrees. He said in an interview: "They're constructing what they call a 'Smart Grid.' And they're going to make it easier for you and me to call our homes on our cell phones and turn down our air conditioning. . . Great, but that may well mean that a hacker in Shanghai with his cell phone could do the same thing or worse. And a so-called Smart Grid that is as vulnerable as we've got—it's not smart at all, it's a really, really stupid grid."²³

Individual "smart" meters themselves are vulnerable to hacking because the meters can easily be removed and re-programmed, or hacked into wirelessly from laptops. The Associated Press reports: "Computer security researchers say new smart meters that are designed to help deliver electricity more efficiently also have flaws that could let hackers tamper with the power grid in previously impossible ways. At the very least, the vulnerabilities open the door for attackers to jack up a stranger's utility bills. These flaws could also move hackers a key step closer to exploiting one of the most dangerous capabilities of the new technology which is the ability to remotely turn someone else's power on and off."²⁴

That scenario is grim enough. But since smart technology may open the door to malicious hacking and cyber-attacks on a national scale, it becomes a critical issue of national security. Woolsey has disclosed that virtually no agency in the federal government has ultimate responsibility for survivability and protection of the U.S. electrical grid as a whole. He says that if a foreign power ever attacks the grid, through either a physical attack or cyber-terrorism, times will be tough: ". . . When it goes down, we are not in the 1970s pre-web, we're in the 1870s pre-grid, and we don't have enough plow horses or pump handles."²⁵

ALTERNATIVE GREEN ENERGY SYSTEMS SUPPRESSED?

The documentary film *Take Back Your Power* introduces evidence that the vested interests coercing the AMI

systems upon our nation are the very same forces which are suppressing cleaner and more sustainable energy technologies.

One path to the suppression of competitive technologies is apparently through the U.S. Patent Office. The Commissioner of Patents can order inventions and technologies to be kept secret indefinitely. At his discretion, he can deny any patent or withhold the publication of any patent application. By the end of fiscal year 2011, there were over five thousand Patent Office secrecy orders in effect, according to the Federation of American Scientists.²⁶ It is believed by some scholars that among these many submerged patents are several clean and viable energy technologies which are perceived as a threat by the powerful oil, gas and fracking networks.

Germany is said to be producing almost 50 percent of its energy from solar photovoltaic panels. A large amount of this solar energy is produced by individuals and small businesses who feed their excess energy back into the grid. The German system is reported to be generating clean energy equivalent to that generated by twenty nuclear power stations operating at full capacity. Advanced solar technology has allowed Germany to announce that it may abandon dangerous nuclear energy, a welcome development following the 2011 Fukushima nuclear meltdown.²⁷

Mounting evidence demonstrates that "smart" meter systems will not significantly curtail U.S. electricity use. Several pilot programs across the nation have shown little or no energy reduction or savings. In 2011, Connecticut Attorney General George Jepson announced that "smart" meter pilot results showed no beneficial impact on total energy usage in his state. He said that the benefits of advanced meters would not merit the five hundred million dollar cost of their implementation.²⁸

Ironically, the "smart" meters themselves use considerable energy in order to perpetually signal the mesh system. In addition, millions of "smart" appliances will be always "on" and always communicating with meters, thereby causing more use.

A report in Consumer's Digest muses: "What's discouraging about the all-but-mandatory dynamics of the smart-meter transition is that it's appealing only if you are willing to pay a lot of money to save a little electricity.... If the success of the smart meter transition is based on consumers saving money and energy in the long run, we can't help but imagine that it could take decades for that to happen—if it ever does."²⁹

REFLECTIONS ON OUR PRIORITIES

The formidable challenges presented by AMI smart technology lead back to the dilemma of national priorities. How much money and wellbeing should we sacrifice to achieve a tiny reduction in national energy consumption fifteen years from now?

Media sources continually report on many people suffering from electro-hypersensitivity (EHS) who have fled their smart-metered homes in desperate search of habitation that does not cause heart palpitations, rashes, severe tinnitus and/neurological disabilities. Electro-sensitivity appears to be a sort of auto-immune condition developed by a growing number of victims, usually after acute exposure to electromagnetic radiation.

Sandi Aders of Idaho has been debilitated since a "smart" meter was installed on her home. Unaware of any hazard, she and her husband used a bedroom where a transmitting digital meter was mounted on an outside wall directly opposite their bed. Day by day after the meter's installation they grew sicker and more exhausted. They tried to cope with rashes and odd nerve disorders. Simultaneously they developed the symptoms of glaucoma. They finally hit the road to seek relief from a house that made them cruelly sick, but the damage has proven irreversible. Sandi is now so electrosensitive that she lives without electricity, phones or computers. No physician has found a solution to the low, pulsed radio frequency hum and droning sounds that she hears constantly, especially when she is near electrical power lines. Due to the nerve damage she says she acquired after her "smart" meter exposure, Sandi endures the same audio-torture being reported by many other people nationwide from similar exposures.³⁰

Dr. Andrew Goldsworthy, British biologist and expert on the bio-effects of microwave radiation, explains: "The duration of the radiation seems to be more important than its strength, with the effects being cumulative as more and more cells are damaged. Interestingly, DNA damage from cell phone radiation is greater when the exposure is intermittent (five minutes on, ten minutes off) than when continuous (Diem et al., 2005). This may be because the cells are constantly adapting and using energy to defend themselves; they drop their guard during the off period and are caught unawares when it goes on again...."Smart" meters, which operate 24/7 and radiate modulated microwaves intermittently, can therefore be expected to be particularly harmful to DNA."³¹

The National Institutes of Health confirms the fact that all cancer begins with damaged DNA. In a nation with fourteen million cancer victims and 1.6 million new cancer cases diagnosed each year (not counting millions of skin cancers), exposure to EMR from wireless technologies matters to everyone's health.

Surely the welfare of pregnant women and children is of utmost importance to our society. EMR from "smart" meters and other electronics has the potential to damage the entire human reproductive system. This was already reported in 1971 by the Naval Medical Research Institute (NMRI) at Bethesda, Maryland, which collected over twenty-three hundred studies to document the impacts of non-ionizing radiation on human health. Dr. Zorach R. Glaser, Ph.D., compiled these studies. Among deleterious effects listed in Dr. Glaser's report are altered menstrual activity, male impotence, altered sex ratio of births (more girls), and decreased lactation in nursing mothers.³²

Today, medical science offers much additional confirmation that EMR emissions from AMI meters and their support infrastructure have the potential to damage ovaries and ova cells, harm the fetus, cause low birth weight, and even induce premature delivery.³³ There is also increasing evidence that EMR emissions may be linked to America's epidemic of autistic spectrum disorders.³⁴

Public awareness is a first step toward forging solutions to the many challenges of the "smart" grid conundrum. We need citizens, legislators and regulators concerned about health. We need "smart" meters recalled and analog mechanical meters restored. We need to stop deploying any new technologies until they are proven harmless.

In its scathing letter to the Massachusetts Department of Public Utilities, Northeast Utilities has stated that achievement of gridmodernization objectives "does not require the implementation of AMI, despite the Department's suggestion that it does." This letter contains sensible alternative recommendations for cost-effective grid modernization, fully achievable without noxious AMI radiation hazards.³⁵

It is truly wise to become educated on all of these vital issues. We must be proactive in order to understand what utility companies are planning for our individual neighborhoods and for our states.

In these challenging times, vigilance and reliable information empower us to prevent suffering and protect everyone's health.

SIDEBARS

THE 2012 BIOINITIATIVE REPORT OVERVIEW: IMPLICATIONS FOR HEALTH FROM THE ROLLOUT OF "SMART" METERS

BY CINDY SAGE, CO-EDITOR

The BioInitiative Report 2012 updates the last five years (2007-2012) of science, public health, public policy and global response to the growing health issue of chronic exposure to electromagnetic fields and radio frequency radiation in the daily life of billions of people around the world. The Report has been prepared by 29 authors from ten countries, including ten medical doctors, twenty-one PhDs, and three MsC, MA, or MPHs. Among the authors are three former presidents of the Bioelectromagnetics Society (BEMS), and five full members of BEMS. One distinguished author is the chair of the Russian National Committee on Non-Ionizing Radiation. Another is a senior advisor to the European Environmental Agency.

The great strength of the BioInitiative Report (www.bioinitiative.org) is that it has been carried out independently of governments, existing bodies and industry professional societies. Precisely because of this, the BioInitiative Report presents a solid scientific and public health policy assessment that is evidence-based.

The global conversation on why public safety limits for electromagnetic and radio frequency fields remain thousands of times higher than exposure levels that health studies consistently show to be associated with serious health impacts has intensified since 2007. Roughly eighteen new studies have been published in the last five years reporting effects at exposure levels ten to hundreds or thousands of times lower than allowed under safety limits in most countries. Yet no government has instituted comprehensive reforms. Some actions have been taken that highlight partial solutions. The Global Actions chapter presents milestone events that characterize the international "sea change" of opinion that has taken place, and reports on precautionary advice and actions from around the world.

The world's populations—from children to the general public to scientists and physicians—face an intensifying barrage from corporate marketing propaganda that urges the insertion of the latest wireless devices into their everyday lives. This occurs even while even an elementary understanding of the possible health consequences of using these devices is beyond the ability of most people to grasp. Exposures are invisible and testing meters are expensive and technically difficult to operate. The technology industry promotes new gadgets and generates massive advertising and lobbying campaigns that silence debate, while the reliable, non-wireless versions are discontinued against public will. There is little labeling, and little or no informed choice. In fact, there is often not even the choice to stay with safer, wired solutions, as in the case of the "smart grid" and "smart" wireless utility metering, an extreme example of a failed corporate-governmental partnership strategy, ostensibly initiated for energy conservation.

A collision of the wireless technology rollout and the costs of choosing unwisely has begun and will grow. The groundwork for this collision is being laid as a result of increased exposure, especially to radio frequency fields, in education, housing, commerce, communications and entertainment, medical technologies and imaging, and in public and private transportation by air, bus, train and motor vehicles. Special concerns are the care of the fetus and newborn, the care for children with learning disabilities, and consideration of people under protection of the Americans with Disabilities Act, which includes people who have become sensitized and physiologically intolerant of chronic exposures. The 2012 report now addresses these issues and presents an update of issues previously discussed in the BioInitiative Report 2007.

WHY SHOULD WE CARE?

The stakes are very high. Human beings are bioelectrical systems. Our hearts and brains are regulated by internal bioelectrical signals. Environmental exposures to artificial EMRs can interact with fundamental biological processes in the human body. In some cases, this may cause discomfort, sleep disruption, loss of wellbeing (impaired mental functioning and impaired metabolism), or sometimes a dread disease like cancer or Alzheimer's disease. It may interfere with fertility or successful full-term pregnancy, or result in brain development changes that harm the child. It may be these exposures play a role in causing long-term impairments to normal growth and development in children, jeopardizing their futures as healthy, productive adults. We have good evidence that these exposures can damage our health, or that of children of the future who will be born to parents now immersed in wireless exposures.

In the U.S., the deployment of wireless infrastructure (cell tower sites) to support cell phone use has accelerated greatly in the last decades. The spread of cell towers in communities—often placed on preschool, church, daycare, and school campuses—means that young children receive thousands of times higher RF exposures in home and school environments than existed even 20-25 years ago. CTIA estimates that in 1997 there were 36,650 cell sites in the U.S. This number increased rapidly to 131,350 in June 2002, 210,350 in June 2007, and 265,561 in June 2012 (CTIA, 2012).

These wireless antennas for cellular phone voice and data transmission produce whole-body RFR exposures over broad areas in communities—an involuntary and unavoidable sources of radio frequency radiation exposure.

Further, the nearly universal switch to cordless and cell phones from corded landline phones means close and repetitive exposures to both EMF and RFR in the home. Other new RFR exposures come from Wi-Fi access points (hotspots) that radiate continuously in cafés, stores, libraries, classrooms, on buses and trains, and from personal Wi-Fi enabled devices (such as iPads, tablets, and PDAs).

The largest single source of community-wide, pervasive RFR yet rolled out is the "smart meter" infrastructure. This program places a wireless device (like a mini-mobile phone base station) on the wall, replacing the electromechanical (spinning dial) meter. They are to be installed on every home and classroom in every building with an electric meter. Utilities from California to Maine have installed tens of millions already, despite the deep alarm of experts and enormous public resistance. The wireless meters produce spikes of pulsed radio frequency radiation continuously, and in typical operation, will saturate living spaces at levels that can be much higher than those already reported to cause bioeffects and adverse health effects (utilities can only say they are compliant with outdated federal safety standards, which may or may not always be true—see <http://sagereports.com/smart-meter-rf>). These meters, depending on where they are placed relative to occupied space in the home or classroom, can produce RFR exposure levels similar to those within the first 100 feet to 600 feet of a mobile phone base station (cell tower).

The cumulative RFR burden within any community is largely unknown. Both involuntary sources (like cell towers, smart meters, and second-hand radiation from the use of wireless devices by others) plus voluntary exposures from personal use of cell and cordless phones, wireless routers, electronic baby surveillance monitors, wireless security systems, wireless hearing aids, and wireless medical devices like implanted insulin pumps, all add up. No one is tallying up these combined exposure levels. Billions of new RFR transmitters from the "smart" meter rollout alone will raise the baseline RFR levels and add significantly to the existing RFR background.

DO WE KNOW ENOUGH TO TAKE ACTION?

There is more evidence than we need. Over the last five years, new scientific studies indicate the situation is much worse than in 2007 and yet people around the world have so much more daily exposure than even five years ago. Exposures are linked to a variety of adverse health outcomes that may have significant public health consequences. When considering billions of people world-wide, no argument to maintain the status quo can be persuasive now. In twenty-one technical chapters of the BioInitiative Report 2012 update, the contributing authors discuss the content and implications of 1800 new studies. Overall, there is reinforced scientific evidence of risk where there is chronic exposure to low-intensity electromagnetic fields and to wireless technologies (radio frequency radiation including microwave radiation).

There is more evidence in 2012 that such exposures damage DNA, interfere with DNA repair, and are hazardous to the nervous system. More and better studies on the effects of mobile phone base stations (wireless antenna facilities or cell towers) report lower RFR levels over time can result in adverse health outcomes. An increasing number of studies have examined the effects of wireless laptops as well as cell phones worn on the belt or in the pocket of men on sperm quality, motility, and sperm death. A dozen new studies focus on the fetus, infant and young child, and child-in-school.

The levels of exposure we face in 2012 are higher, and have crept into everyday life, even for children. The levels at which undesirable effects on health and well-being are seen is much lower. There is much greater involuntary exposure, and it is nearly unavoidable even for people who choose not to "go wireless" via second-hand radiation effects. Safe forms of communication by land-line telephone are being phased out without general public knowledge or agreement. There is no informed consent for consumers (warning labels on cell phones, for example, have been defeated by telecom industry lobby groups). It is still difficult or impossible for consumers to get reliable information on levels of exposure from wireless devices. It is simply beyond the reach of people to identify where excessively high levels of exposure occur in their communities, and it is very rare for a county or state health department to accommodate requests for information or provide measurements.

The range of possible health effects that are adverse with chronic exposures has broadened. The most serious

health endpoints that have been reported to be associated with extremely low frequency (ELF) and/or radio frequency radiation (RFR) include childhood and adult leukemia, childhood and adult brain tumors, and increased risk of Alzheimer's and amyotrophic lateral sclerosis (ALS). In addition, there are reports of increased risk of breast cancer in both men and women, genotoxic effects, pathological leakage of the blood-brain barrier, altered immune function including increased allergic and inflammatory responses, miscarriage, and some cardiovascular effects. Insomnia is reported in studies of people living in very low-intensity RFR environments with Wi-Fi and cell tower-level exposures.

We could do otherwise. Each wireless version had a wired counterpart with none of the wireless-associated health effects. It is time to re-think the wireless tsunami and educate people about health, privacy and security risks. It is past time to develop new safety standards. Now we must look to less harmful ways to communicate, move ourselves from place to place, shop, sleep, recreate, save energy and educate our children in school.

Adapted from the 2012 BioInitiative Report and reprinted with permission.

ON HOW TO REFUSE A "SMART" METER

Jerry Day posts the following letter on jerryday.com for anyone who chooses to refuse installation of a "smart" meter on their residence or property. He suggests that you consult your attorney to tailor the letter to your specifications, then send your revised version to your utility company's CEO or president by certified mail.

Keep copies of your letter and your certified mail receipt.

If anyone attempts to install a transmitting meter on your residence, show them the copy of your letter and proof of its delivery (your certified mail receipt). Tell them that installing a transmitting meter on your residence will thereby be a criminal trespass. If they attempt this, you will call the police, request that the installer be taken into custody, and file a criminal complaint with the police.

If the company responds to your letter in writing, Jerry Day suggests that you write back. Remind them that they have not proven that they may lawfully install any radiation-emitting surveillance device on your residence.

MODEL LETTER

Your Name/Energy Customer's Name
Street Address
City, State Zip Code

Name of Utility's CEO, President, General Manager or Board Chair
Utility Company
Street Address
City, State Zip Code Date

NOTICE OF NO CONSENT TO TRESPASS, SURVEILLANCE OR RADIATION POLLUTION. NOTICE OF LIABILITY, ADHESION CONTRACT.

Dear (CEO's Name) and All Agents, Officers, Employees, Contractors and Interested Parties:

In regard to your possible intention to install a "smart" or other digital utility meter at the above address, those meters violate the law. They cause endangerment to people in their vicinity due to the following factors:

1. They individually identify electrical devices and record when they are operated, causing invasion of privacy.
2. They monitor household activity and occupancy in violation of rights and domestic privacy.
3. They transmit wireless signals that are interceptable by unauthorized and distant parties.
4. No power company or other individual agency has consent to conduct surveillance or monitoring or to emit

radiation (EMR) on our property or residence with a digital meter.

5. Those with access to the data can review a permanent history of household activities taken and viewed unlawfully and without the consent of occupants and subjects of the surveillance.

6. Those databases may be shared with, or fall into the hands of, unauthorized law enforcement, private hackers of wireless transmissions and other unidentified parties for use against the interests of the energy subscribers and the occupants of the structures.

7. "Smart" meters are, by definition, surveillance devices that violate federal and state wiretapping laws by recording and storing databases of private and personal activities and behaviors recorded without the consent or knowledge of those people who are monitored.

8. It is possible, for example, with analysis of certain "smart" meter data, for unauthorized and distant parties to determine medical conditions, sexual activities, vacancy patterns, general affluence, trade secrets and physical locations of occupants.

9. By intentional transmission and/or incidental disruption of house current, digital meters emit cancer-causing electromagnetic radiation, which violates laws against public endangerment, assault and commission of bodily harm.

10. Digital meters are designed to transmit using electromagnetic radiation known to cause cancer and many other diseases, illnesses and symptoms.

For the above reasons, and by right of occupancy and property ownership, I prohibit, and deny consent of, any installation and use of any monitoring, eavesdropping, surveillance and radiation-emitting devices on my property and place of residence, especially in the form of a digital, transmitting utility meter.

Any attempt to install any such device directed at me or other occupants on my property or place of residence will constitute trespass, stalking, wiretapping and assault, all prohibited and punishable by law through criminal and civil actions. All persons, government agencies and private organizations responsible for installing or operating monitoring devices that I consider unlawful will be fully liable for major financial and compliance claims and demands in excess of one million dollars.

This is a legal notice. The liabilities and obligations listed above are true and binding upon all parties upon delivery of this notice. These terms and conditions apply without regard to status or existence of any "opt-out" contract.

Under my authority as owner and/or occupant of the above property, and under your implied or expressed application to enter that property, this is an adhesion contract to which you are now bound until and unless you respond with factual rebuttal in a sworn statement by an authorized and identified party within 21 days of this delivery. Any rebuttal must show your authority to install an unlawful radiation-emitting surveillance device (digital electric "meter") on my property without my consent. Expect rebuttal to any such claim. Any failure to timely show and prove full and binding authority to install the unlawful and harmful device on my property and/or place of occupancy will be an agreement with all terms and conditions herein. I/we deny and refuse any past, present and future proposal, offer, demand or claim contrary to any terms or conditions herein.

Notice to principal is notice to agent, and notice to agent is notice to principal.

Signature

Name of energy user and/or customer

Note: If a utility company has already installed a transmitting meter on your residence and you want it removed, first find out if the company allows an opt-out. If they do, simply go through the proper channels for having it removed and replaced with a mechanical meter. If opt-outs are not available in your area, Jerry Day offers a letter that demands removal at www.freedomtaker.com.

TEN QUESTIONS FOR YOUR UTILITY COMPANY

Utility companies around the world have been caught lying to their customers about their smart meter programs.

The following will allow you to cut to the truth with your local utility and smart meter company.

Note: For additional research and resources, please see Film References and Key Issues & News.

1. Am I legally required to accept a smart meter?

Answer: No. You do not have to accept a smart (or "advanced" or "upgraded") meter. Any utility company who states this is lying.

2. Can I expect my energy bills to go up with a smart meter?

Answer: Yes. Where smart meters have been deployed, energy bills have consistently risen – sometimes dramatically. The price increases will become even more pronounced once Time-of-Use (TOU) pricing is implemented. You will be charged more for electrical use when you need the electricity the most (i.e. when you come home from work or school). The idea that you will start doing your laundry at 3:00 AM when prices are cheaper is a dystopian fantasy dreamt up by the same people who think it is safe to put a toxic, microwave radiation emitting spy-device on your home.

3. In the United States, my 4th Amendment rights prevent unlawful search and seizure in my own home. Do smart meters violate these rights?

Answer: Yes. With a smart meter on your home, you can no longer retreat into your own home and expect to have the privacy that is guaranteed by law. Thus, smart meters are unconstitutional and illegal.

"With smart meters, police will have access to data that might be used to track residents' daily lives and routines while in their homes, including their eating, sleeping, and showering habits, what appliances they use and when, and whether they prefer the television to the treadmill, among a host of other details."

US Congressional Research Report, "Smart Meter Data: Privacy and Cybersecurity," p. 7, 3 February 2012

4. Is it true that my energy use information will be sold to third-party vendors in order to market products or track my activities in some way?

Answer: Yes. The California Public Utilities Commission has stated on the record that they look forward to the business opportunities that will come from selling our personal energy use data. Just like Gmail and Facebook data, your privacy will not be preserved if you have a smart meter.

"I support today's decision because it... expands consumer and third-party access to electricity usage and pricing information.

I hope this decision stimulates market interest."

Commissioner Timothy Alan Simon, "California Commission Adopts Rules...", 31 July 2011

5. Will the smart meter program help the environment by reducing energy use?

Answer: No. None of the existing smart meter programs has shown energy savings. In fact, having a wireless smart meter and smart grid mesh system takes more energy because now there are millions of new wireless transmitters on the grid that are constantly using energy and constantly transmitting. They all take additional energy that the grid must produce. Simple energy conservation steps by citizens would have saved much more energy, but would not have been profitable for utility companies, the smart meter industry and governments.

Furthermore, any technology that harms the health of humans, plants and animals like that of microwave radiation emitting smart meters can never be considered environmentally sustainable or "green." It is the exact opposite – an environmental calamity.

"The pilot results showed no beneficial impact on total energy usage."

Connecticut Attorney General George Jespen, "Jespen Urges State Regulators...", 8 February 2011

6. Have there been fires where smart meters have been installed?

Answer: Yes, throughout the world there have been thousands of fires that have occurred once smart meters have been installed. This is happening because of faulty installations, old wiring that cannot handle the new meters and when smart meters have been turned on remotely. In Pennsylvania, PECO/Exelon halted their installation program because of more than twenty-four documented fires. Property damage has been significant and one man died in California because of a smart meter fire. Notably, the vast majority of smart meters are not approved or listed by UL (Underwriters Laboratories). Because of this, a fire related to a smart meter on your home may not be covered by your insurance.

"For myself, as an adjuster, I believe the Smart Meters are a real threat to the safety of your home, business and property. I have personally worked two large homeowner fires in which the Smart Meters were determined as responsible."

Norman Lambe, insurance adjuster, "The not so smart meter", 13 November 2011.

7. Are there any known health effects related to smart meters?

Answer: There are over 6,000 studies showing biological effects from the same form of radiation that smart meters invisibly emit – commonly known as "electro-smog" pollution. Additionally, thousands of people across the United States, Canada and Australia have become ill once smart meters have been installed on their homes. Medical doctors and scientists around the world are speaking out on the dangers of smart meters. Smart meters emit radiation continuously and cannot be turned off at night when radiation is the most dangerous for the body and brain. Comparatively, a cell phone – which emits radiation at levels hundreds of times lower – can be turned off when not in use.

Secondly, smart meters generate what's known as "dirty electricity" radiation pollution throughout your home, because of the switching-mode power supply that they utilize. An "opt-out" to a wired digital meter still produces dirty electricity. Only a non-digital analog meter does not produce dirty electricity.

An individual opt-out still exposes you to the radiation from the neighbors' meters and other grid infrastructure. And every smart meter in your neighborhood adds to the dirty electricity in your home, even if you opt out, because all neighboring homes share the same power substation.

"We have noted from previous health hazard histories such as that of lead in petrol, and methyl mercury, that 'early warning' scientists frequently suffer from discrimination, from loss of research funds, and from unduly personal attacks on their scientific integrity. It would be surprising if this is not already a feature of the present EMF controversy as it seems to be still a common practice as has been recently reported in Nature."

Professor Jacqui McGlade, executive director of the European Environment Agency, 15 September 2009

8. How many pulses of radiation does my smart meter emit per day?

Answer: Wireless smart meters around the world have been shown to emit between 5,000 and 190,000 pulses per day. Your utility may state they only transmit 45-60 seconds a day. This is because they are only adding up the millisecond pulses that occur constantly throughout the day. What they are not telling you is that the pulses occur every few seconds, which means that the meters are constantly emitting microwave radiation. Your smart meter is continuously communicating with hundreds of other smart meters, grid infrastructure, and in the future, all appliances in your home.

The levels at which a single smart meter emits radiation can be more than 80 times higher than recommended safety levels based upon current published science. (Examples: www.BioInitiative.org, and <http://www.baubiologie.de/site/english.php>)

In addition to current health risks, unless the smart meter programs are stopped, you will eventually have 10-20 appliances that each emit a pulse of radiation every few seconds in order to communicate wirelessly with your smart

meter. This will fill your home with even more dangerous pulsed microwave radiation affecting your entire family.

"There is no substitute for a roll back of all Smart Meters at the community level, or higher."

Ronald Powell, PhD Applied Physics, "Biological Effects from RF Radiation at Low-Intensity Exposure, based on the Bio-Initiative 2012 Report, and the Implications for Smart Meters and Smart Appliances", 2013

9. Have smart meters been proven to be safe?

Answer: No. The smart meter industry has not released one actual study on whether smart meters are safe for human beings. They do not want to look at something that would damage their business. This is the case even though thousands of people have become ill once smart meters were installed on their home and so much science shows that microwave radiation is dangerous.

It is interesting to note that smart meters do meet federal agency "safety" guidelines. However, the FCC and others' guidelines are not actually meant to protect our health. In fact, they are only meant to protect from acute tissue heating and electrical shock over several minutes. They are not meant to protect humans from the long-term, non-thermal levels of microwave radiation emitted by devices such as smart meters. In fact, there are no true governmental safety standards that govern smart meters. The utility company is misinformed or simply lying when they say they are safe because they meet the FCC guidelines.

"If a manufacturer wants to give a product to a consumer, especially in this case to everybody – imposed on everybody—they are the ones who should carry the burden to prove it's safe before they can give it to the people. It's not up to consumers to demonstrate they are unsafe."

Dr. De Kun Li MD PhD MPH, senior research epidemiologist, Kaiser Permanente Division of Research, in Take Back Your Power

10. Are utilities getting financial kickbacks for forcing smart meters on everyone?

Answer: Yes. As Time Magazine has reported, in the United States eleven billion dollars of taxpayer funds (though there are reports that this is a conservative estimate) were spent as "incentives" for utilities to attempt to force the installation of smart meters upon all of their customers without their consent. As this money is divided amongst all utilities, many energy providers are actually receiving hundreds of millions of dollars in compensation, but first they have to install the meters.

As this sort of incentivizing, perhaps also called bribery, is happening in similar fashion in many other industrialized countries, the multinational smart meter/smart grid initiative could potentially turn out to be the largest attempted financial scam in modern history.

REFERENCES

1. "IEE Report finds Smart Meters Widely Deployed, Laying Groundwork for Expanded Grid Benefits," The Edison Foundation for Electric Innovation, 2014.
2. American Academy of Environmental Medicine, Letter to Public Utilities Commission of the State of California, January 19, 2012.
3. The BioInitiative Report 2012.
4. Ibid.
5. This figure is offered in the 2013 documentary film "Take Back Your Power," Josh del Sol, producer.
6. "Why Smart Meters Might be a Dumb Idea," W. Kelly, *Consumer's Digest*, January 2011.
7. Ibid.

8. This comprehensive list of systems within a smart meter mesh infrastructure is found in Sempra Energy Proprietary and Confidential Information, Volume I Technical and Project Plan, August 2009, published for San Diego Gas and Electric (SDG&E) in a proposal for its GridComm System. This document, describing the vast microwave mesh infrastructure needed for SDG&E's GridComm smart metering system, was endorsed by a vendor team that includes CISCO, IBM, Arcadian and CSC.
9. "Epidemiological Evidence for a Health Risk from Mobile Phone Base Stations." *Int J Occup Env Health*:16- 3, Jul/ Sept 2010, p. 263-267.
10. International Agency for Research on Cancer (IARC) press release, Lyon France, May 31, 2011.
11. "Biological and Health Effects of Microwave Radio Frequency Transmissions, A Review of the Research Literature: A report to the Staff and Directors of the Eugene Water and Electric Board," Paul Dart M.D. et al, June 4, 2013.
12. "The 'Medusa' Meter—A Bigger Unsafe Meter for Preferred Customers," stopsmartmeters.org.
13. These radiation measurements were obtained and discussed by producer Josh de Sol in the documentary film "Take Back Your Power."
14. "Smart Meters are Not an Environmentally Sustainable Option," spiritofchange.org. This information on documented blood damage from microwave exposure is presented by Dr. Frank Springob of Port Angeles, Washington, and discussed in the documentary film "Take Back Your Power."
15. Dr. Klinghardt makes this statement in the documentary film "Take Back Your Power."
16. Assessment of Radiofrequency Microwave Radiation Emissions from Smart Meters, Sage Associates, Santa Barbara, California, January 2011.
17. "Smart Meters Violate FCC Radiation Exposure Limits Says New Study," Stopsmartmeters. org. 2012.
18. Tantalus News press release, December 19, 2013: Inland Power and Light Turns to Tantalus and Itron for Smart Grid Communications Network.
19. "Hackers Use Refrigerators and TVs to Launch Cyber Attack," Electronic Products.com, January 17, 2014.
20. EMF Safety Network, See: Smart Meters at emfsafetynetwork.org.
21. "Now Radio Waves coming from your Faucet?" Texans United Against Smart Meters, January 2, 2013.
22. Initial comments submitted January 17, 2014 on behalf of Northeast Utilities in response to smart meter proposal issued by the Massachusetts Department of Public Utilities of December 2013, DPU 12-76-A.
23. Energy Now News, stopsmartmeters.com, August 15, 2011. This is a transcript of the video: "The Mix: Cyber-terrorism's Threat."
24. "A Hacker's Dream: Smart Meters have Security Holes," Associated Press, March 28, 2010.
25. Energy Now News, stopsmartmeters.com, August 15, 2011. This is a transcript of the video: "The Mix: Cyber-terrorism's Threat."
26. "Connecting Dots: US Patent Office Admits Energy Suppression," Josh del Sol, thebigpitcher. org, September 2012.
27. Ibid.

28. "Smart Meter Interference," Martine Victor, *The Manchester Journal*, March 14, 2013.
29. "Why Smart Meters Might be a Dumb Idea," W. Kelly, *Consumer's Digest*, January 2011.
30. A good site for exploring the nuisance of an oppressive environmental hum heard by many across the nation is Sandaura's Blog at sandaura.wordpress.com. This blog features testimonies from people who can hear various radio frequency hums, standing waves, and droning sounds believed by many observers to be emanating from many smart grid networks.
31. How Smart Meters Can Cause Autism and Cancer, Dr. Andrew Goldsworthy, *MCSA News*, Volume 6, Issue 8, 2011.
32. *Bibliography of Reported Biological Phenomena (Effects) and Clinical Manifestations Attributed to Microwave and Radio Frequency Radiation*, Zorach R. Glasser, Naval Medical Institute, National Naval Medical Center, October 1971, AD 750271.
33. 312 References on Electrosmog, Fertility and Reproduction published by EMF Safety.org. This is a comprehensive bibliography of scientific studies showing deleterious effects of electromagnetic fields on fertility and reproduction, last updated June 2012.
34. "Findings in Autism (ASD) Consistent with Electromagnetic Fields (EMF) and Radiofrequency Radiation (RFR)," Martha Herbert, Ph.D., M.D., Pediatric Neurology TRANSCEND Research Program Massachusetts General Hospital and Harvard Medical School. This paper was prepared for the BioInitiative Working Group December 2012.
35. Initial comments submitted January 17, 2014 on behalf of Northeast Utilities in response to smart meter proposal issued by the Massachusetts Department of Public Utilities of December 2013, DPU 12-76-A.

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10/03/92

Appendix Tab 6

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

**ANSWER AND NEW MATTER TO
FORMAL COMPLAINT**

Filed on behalf of Respondent
Duquesne Light Company

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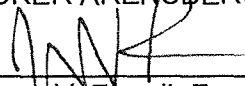
Pittsburgh, PA 15222

NOTICE TO PLEAD

TO: COMPLAINANTS MICHELE AND FRANCIS HRIADIL

**YOU ARE HEREBY NOTIFIED TO FILE A WRITTEN RESPONSE TO THE WITHIN NEW
MATTER OF RESPONDENT DUQUESNE LIGHT COMPANY WITHIN TWENTY (20) DAYS
OF SERVICE HEREOF, OR A JUDGMENT MAY BE ENTERED AGAINST YOU.**

TUCKER ARENSBERG, P.C.



Jeremy V. Farrell, Esquire

Lauren N. Rulli, Esquire

Counsel for Duquesne Light Company

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

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No: C-2016-2571726

ANSWER AND NEW MATTER TO FORMAL COMPLAINT

TO THE HONORABLE COMMISSION:

Respondent Duquesne Light Company ("Duquesne Light" or the "Company"), by and through its attorneys, Tucker Arensberg, P.C., files this Answer and New Matter to the Formal Complaint filed by Michele and Francis Hriadil:

1. Admitted.
2. Admitted.
3. Admitted.
4. Duquesne Light denies all material allegations in the Complaint unless specifically admitted. For the reasons set forth below and in Duquesne Light's Preliminary Objections, Complainants -- who have not yet had a smart meter installed at the service address -- may not opt out of Duquesne Light's smart meter program. Duquesne Light is required by state law to install smart meters throughout its service territory, which includes Complainants' residence. Duquesne Light further denies that a smart meter would have an adverse impact on Complainants' health, safety, or privacy.

Pursuant to Act 129 of 2008, Duquesne Light is in the process of upgrading its metering infrastructure. As part of this upgrade, Duquesne Light will replace approximately 600,000 existing electric meters with new, digital models throughout its service territory.¹ These smart meters allow two-way communication between the meter and Duquesne Light via a secure wireless network. Duquesne Light has also added policies to its Tariff relating to its smart meter program. Copies of the pertinent pages of Duquesne Light's Tariff are attached as Exhibit A.

With respect to Complainants' concerns about the radio frequency ("RF") of its new smart meters, Duquesne Light states that the Company's smart meters, like its traditional analog meters, utilize low-energy RF waves to transmit electricity, but transmit RF waves for only short periods every day. Furthermore, the Federal Communications Commission ("FCC") has established safe limits for RF exposure and the RF exposure for Duquesne Light's smart meters is well below the limits set by the FCC. In fact, according to a study completed by the California Council of Service and Technology, smart meters, when installed and maintained properly, result in lower RF emission than most common household electronic items, such as cell phones, microwaves, wireless internet, baby monitors, and garage door openers. The World Health Organization has similarly concluded that no adverse health effects have been demonstrated to result from exposure to low-level RF. A copy of Duquesne Light's promotional brochure titled "Understanding Radio Frequency and Your New Meter" that discusses these matters is attached as Exhibit B. In light of the foregoing, Duquesne Light denies that the

¹ The AMI Program offers various benefits to Duquesne Light's customers. Some of the initial benefits include: online tools that provide access to customer's electric usage information 24/7 and help customers discover ways to manage their bills as well as email or phone alerts designed to reduce high bill surprises and help customers manage high usage activity. In the future, the program will also provide outage alerts and restoration of service estimates to help customers plan during emergencies and also provide an optional Time-of-use program that may provide benefits to customers who can shift portions of their power to non-peak hours.

installation of a smart meter at the Property would endanger the health or wellbeing of Complainants.

Duquesne Light also denies that its smart meters pose a safety hazard, as alleged in the Complaint. To the contrary, the meters purchased by Duquesne Light have been tested and found to meet all accuracy, safety, and reliability standards by the American National Standards Institute (ANSI).

By way of background, Complainant Michele Hriadli established service in her name at 331 Shady Ridge Drive, Monroeville, Pennsylvania 15146 (the "Property") on July 31, 1989. Duquesne Light notified Complainants via letter dated August 1, 2016, and a voicemail message on September 24, 2016, that the Company planned to install a smart meter at the Property. Complainants subsequently contacted Duquesne Light to indicate that they did not want a smart meter to be installed at the Property due to perceived health and safety concerns. Duquesne Light's liaison for the Advanced Metering Infrastructure ("AMI") Program, Kevin Baden, spoke with Francis Hriadil on October 11, 2016, to discuss Complainants' concerns. Mr. Baden also advised Francis Hriadil there is not an opt out option available in Pennsylvania at this time. Complainants then filed this Formal Complaint.

Duquesne Light has not yet installed a smart meter at the Property, but, if Complainants want to continue to receive electric service from Duquesne Light, they may not opt out of having the meter installed. State law does not permit the exemption sought by Complainants. Act 129 of 2008 directed Duquesne Light and other electric distribution companies to file smart meter procurement and installation plans with the Commission. Duquesne Light filed such a plan, which was approved by the Commission on May 6, 2013, at Docket No. M-2009-2123948. As set forth more fully in Duquesne Light's New Matter and Preliminary Objections, state law requires that all customers of Duquesne Light -- including Complainants -- receive a smart meter.

The articles and other documents attached to the Complaint are written documents that speak for themselves. Complainants' representations regarding those documents are denied.

5. No response is required to Complainant's request for relief. To the extent that a response is required, Complainants may not opt out of Duquesne Light's smart meter program for the reasons set forth in paragraph 4, which is incorporated by reference as if fully restated.

6. After reasonable investigation, Duquesne Light is without knowledge or information sufficient to form a belief as to whether Complainant has received "Protection from Abuse" order, and, therefore, denies the same.

7(a). It is admitted that this Formal Complaint is not an appeal from the decision of the Bureau of Consumer Services.

7(b). Duquesne Light denies the allegation in paragraph 7(b) of the Formal Complaint that Complainant has not spoken to a representative of the Company. To the contrary, the Company's representatives have communicated with Complainant regarding the smart meter program.

7(c). Duquesne Light incorporates its response to paragraph 7(b) as if fully restated.

8. No response is required to this paragraph.

9. No response is required to Complainant's verification and signature.

NEW MATTER

10. The allegations in the preceding paragraphs of this Answer and New Matter are incorporated by reference as if fully set forth.

11. Act 129 of 2008 directed Duquesne Light and other Electric Distribution Companies ("EDC") to file smart meter procurement and installation plans with the Commission.

12. The Commission approved Duquesne Light's petition for approval of its smart meter procurement and installation plan on May 6, 2013, at Docket No. M-2009-2123948. A copy of the Commission's Order is attached as Exhibit C.

13. Section 2807 of the Public Utility Code provides:

(f) Smart meter technology and time of use rates.

* * *

(2) Electric distribution companies **shall** furnish smart meter technology as follows:

(i) Upon request from a customer that agrees to pay the cost of the smart meter at the time of the request.

(ii) In new building construction.

(iii) ***In accordance with a depreciation schedule not to exceed 15 years.***

66 Pa. C.S. § 2807(f)(2) (emphasis added).

14. The Commission has ruled that “[t]he use of the word ‘shall’ in the statutes indicates the General Assembly’s direction that all customers will receive a smart meter.” Evans v. PECO Energy Co., Docket No. C-2013-2368477, 2013 WL 7019103 at *3 (Pa. P.U.C. Dec. 19, 2013) (Hoyer, ALJ) (emphasis added). Likewise, the Commission Implementation Order relating to the installation of smart meters provides: “The Commission believes that it was the intent of the General Assembly ***to require all covered EDCs to deploy smart meters system-wide when it included a requirement for smart meter deployment ‘in accordance with a depreciation schedule not to exceed 15 years.’***” Id. (quoting Smart Meter Procurement and Installation Implementation Order, Docket No. M-2009-2092655 (entered June 24, 2009)) (emphasis added).

15. Simply put, “there is no provision in the statute that allows customers to ‘opt out’ of smart meter installation, as Complainants desire.” Evans, 2013 WL 7019103 at *3. See also, Francis v. PECO Energy Co., Docket No. C-2014-2451351, 2015 WL 5011620 at *7 (Pa. P.U.C. August 20, 2015) (noting that “there is no provision in the Code, the Commission’s Regulations, or Commission Orders that permits a customer to opt out of having a smart meter installed on

his or her premises."); Povacz v. PECO Energy Co., Docket NO. C-2012-2317176, 2013 WL 392699 (Pa. P.U.C. Jan. 24, 2013).

16. Thus, by planning to install a smart meter at Complainants' residence, Duquesne Light is *complying* with the Commission's directives. State law does not allow Complainants to opt out of Duquesne Light's smart meter program.

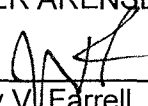
17. On October 13, 2016, the Pennsylvania Public Utility Commission sent a letter to Complainants advising them that Act 129 mandated the deployment of smart meters, that Pennsylvania law does not provide for a customer to "opt out" of the smart meter program and that an Electric Distribution Company has the right to access its equipment. A copy of the Commission's October 13, 2016 correspondence is attached as Exhibit D.

18. Duquesne Light has not yet installed a smart meter at the Property.

WHEREFORE, Respondent Duquesne Light Company, respectfully requests that the Pennsylvania Public Utility Commission deny the relief sought by Complainants in the Formal Complaint, and dismiss the Formal Complaint with prejudice.

Respectfully submitted,

TUCKER ARENSBERG, P.C.



Jeremy V. Farrell, Esquire

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1500 One PPG Place

Pittsburgh, PA 15222

Counsel for Respondent, Duquesne Light
Company

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

VERIFICATION

I, Michael Secchiutti, hereby state that the facts above set forth are true and correct (or are true and correct to the best of my knowledge, information and belief) and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).


Michael Secchiutti

11-3-2016
Date

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

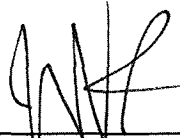
No: C-2016-2571726

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing document upon the participant listed below in accordance with the requirements of 52 PA. Code § 1.54 (relating to service by a participant):

Michele Hriadil and Francis Hriadil
331 Shady Ridge Drive
Monroeville, PA 15146

Dated this 4th day of November, 2016



Jeremy V. Farrell, Esquire
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jfarrell@tuckerlaw.com

Lauren N. Rulli
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Counsel for Respondent, Duquesne Light
Company

Appendix Tab 7

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainants,

No: C-2016-2571726

v.

DUQUESNE LIGHT COMPANY,

Respondent.

**RESPONDENT'S THIRD
SUPPLEMENTAL RESPONSES TO SET
#1 OF DISCOVERY REQUESTS**

Served on Behalf of Respondent
Duquesne Light Company

Counsel of Record for this Party:

Jeremy V. Farrell, Esquire
Pa. I.D. No. 316258
Paul Shane Miller, Esquire
Pa. I.D. No. 319174

Tucker Arensberg, P.C.
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(412) 566-1212

No: C-2016-2571726

relevancy, materiality, privilege or admissibility of evidence, for any purpose, of any of the information provided and/or documents produced. In the event that any privileged information is divulged by Duquesne Light, its disclosure is inadvertent and does not constitute a waiver of any privilege.

5. Duquesne Light's Supplemental Responses are issued pursuant to Judge Watson's Interim Order Granting in Part and Denying in Part Complainants' Motion to Compel Discovery Requests Propounded Upon Respondent on October 5, 2017 (the "Interim Order"). The Interim Order required that Duquesne Light provide full and complete responses to Request Nos. 1. f.; 1. h.; 1. h. i. and ii.; 1. h. iii.; 1. i.; 1. j. ii.; 1. l.; 1. r.; 1. t. ii.; 3. a., 3. b., 3. e., 3. e. ii.; 6. a., 6. c., 6. d.; 6. e.; 9. d. ii., iii., iv.; and 18. c.

6. Duquesne Light has combined its supplemental responses with its original responses for the sake of completeness. Duquesne Light's prior responses to the specific Discovery Requests are written in **bold** font below and its supplemental responses are written in ***bold italic*** font below.

DISCOVERY RESPONSES

1.

f. What is the complete Duty Cycle range (minimum, average, maximum) of each version of Your Smart Meter (the SK9AMI7), and their corresponding Transmission Times in 24 hours (900 MHz, 2.4 GHz)?

The transmit duty cycle for the 900MHz radio within the OpenWay network deployed within Duquesne Light's service territory will vary based on a number of factors, including, but not limited to, where in the mesh network topology the meter is located, the quality of the radio links to neighboring meters, and the level of interference present. Therefore, the most accurate way to estimate the transmit duty cycle is from a statistically significant sample of a representative deployment. The table below shows the Mean, Maximum, Minimum and Median transmit duty cycle for a sample of approximately 7,000 meters over a representative 24-hour window of operation.

	Duty Cycle	Time
Mean	0.06%	53.14 seconds per day

Maximum	0.58%	497.8 seconds per day
Minimum	0.02%	18.31 seconds per day
Median	0.06%	49.81 seconds per day

The OpenWay meter's 2.4GHz Zigbee radio communicates with other HAN (Home Area Network) devices. The table below shows the measured transmission times for an idle Zigbee radio and a Zigbee radio with one of two sample devices joined to the meter. Duquesne Lights expects that, for current deployments, the average meter will have either zero (idle) or one HAN device attached to it.

	Duration of transmission in a 24-hour period	Duty Cycle
Idle Zigbee Radio (no devices joined)	9.9 seconds	0.01%
Meter with Tendril IHD (In Home Display)	132 seconds	0.15%

The response provided above indicates the measured maximum transmit duty cycle as determined from a representative deployment. The read schedule associated with those numbers is provided in Duquesne Light's supplemental response to Request 1(h).

Furthermore, the theoretical maximum amount of time that a Smart Meter could potentially transmit, which Duquesne Light understands Complainants to be seeking, is approximately 67 percent of the day (or about 57,600 seconds). This theoretical limit is established based on the maximum amount of time a single node within the network could gain access to the transmission medium. As seen from the field data, the actual transmit duty cycle is considerably lower than this theoretical maximum.

As shown in the enclosed Certification Exhibit for the Itron SK9AMI7, the Smart Meter -- even assuming it transmitted all day (which is impossible) or at the theoretical maximum it could possibly transmit per day (67 percent of the day) -- the Smart Meter would still comply with the FCC exposure limits. As further explanation, data from the Certification Exhibit shows the following (next page):

MPE Calculation

The Power Density (mW/cm^2) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density (in appropriate units, e.g. mW/cm^2)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

MPE Calculator for Mobile Equipment Limits for General Population/Uncontrolled Exposure*							
Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/cm^2)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm^2)
909.6	28.38	0.61	688.65	2.2	1.660	20	0.227

The FCC limit for the 900MHz radio is $0.61 \text{ mW}/\text{cm}^2$. The Smart Meter generates a power density of $0.227 \text{ mW}/\text{cm}^2$ while transmitting. If the meter transmitted all day long (which, again, is impossible), that would represent only 37 percent of the FCC limits.

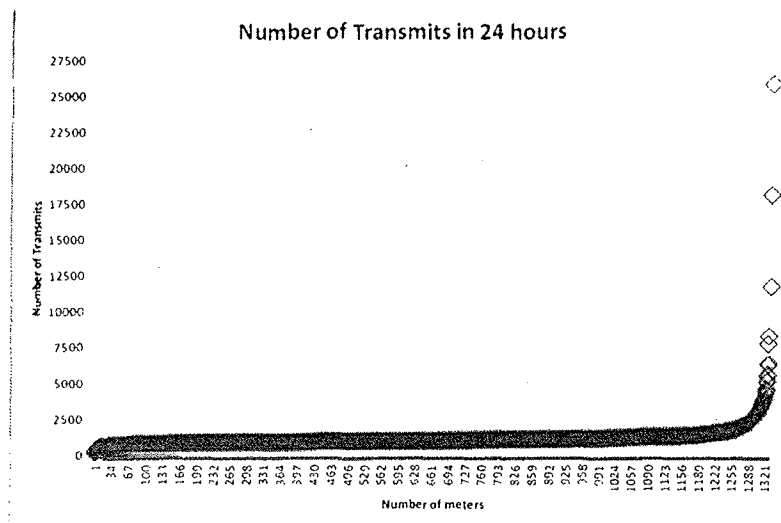
If the theoretical maximum transmit duty cycle of 67 percent is applied, which, again, is not the actual transmit duty cycle used by Duquesne Light, the resulting power density is $0.152 \text{ mW}/\text{cm}^2$, which represents only 25 percent of the FCC limits.

h. How many times/transmissions in total (average, maximum) for any purpose is each version of Your Smart Meter configured to transmit during a 24-hour period (900 MHz, 2.4 GHz)?

This will vary depending on business process, which will determine how read schedules are set up. Typically, there are three to four scheduled reads from each meter in a 24-hour period. With a hierarchical cell structure, meters will relay upstream and downstream traffic within the RF mesh. The total number of transmissions will include the scheduled reads, on-demand reads, and alarms/alerts along with the network traffic needed for command and control (synchronization, security, data integrity and dynamic network resiliency). Based on data gathered from a large, representative OpenWay network deployment (two load profile reads + one register read + one event read per day), the total transmissions are:

- The average number of transmissions in a 24-hour period is approximately 1,268 (less than 1 time/minute);

- The maximum number of transmissions in a 24-hour period is approximately 25,916 (18 times/minute or about once every 3.3 seconds);
- Looking at the distribution of the field data gathered, only a small percentage of the meter population will transmit near the maximum value. In fact, 97 percent of the meters in this random sample transmitted less than 2,500 times in a 24-hour period.
- *Duquesne Light currently schedules two daily meter data interrogations of all meters. These interrogations are requested at midnight and 4:00 pm and typically take up to four hours to complete with responses from all meters. Duquesne Light also schedules one interrogation per week to capture network data, which typically occurs on Monday evening at 8:00 pm and typically takes four hours to complete with all responses. Duquesne Light has plans to add another daily meter data interrogation at 8:00 am that will typically take up to 4 hours to complete. Daily data collected from the Smart Meter is used for meter reading, collecting usage data, and collective event data (like tampering and outage events).*



The reference to "business processes," in this and all of Duquesne Light's prior and subsequent responses, is related to the established daily read profile that Duquesne Light establishes to ensure it collects the required data at the required times to support their operational and billing processes. This typically translates to between one and three daily meter read windows. Current business processes at Duquesne Light that may affect meter transmission frequency include: rendering bills; checking bill accuracy; remotely connecting or disconnecting meter; investigating theft or tampering; checking outage events; assessing power quality or reliability; investigating customer inquiries/complaints; administering demand-response programs;

administering home area network (HAN) programs for participating customers; and updating meter firmware/software.

For the field analysis data previously provided, the daily read schedule was as follows:

- *From 12:00 am to 6:00 am:*
 - *10 percent of meters returning 1 data channel of 15 minute load profile for the previous 24 hours (3-phase, industrial meters);*
 - *5 percent of meters returning 2 data channels of 15 minute load profile for the previous 24 hours (3-phase, industrial meters); and*
 - *85 percent of meters returning 1 channel of 60 minute load profile for the previous 24 hours (single phase, residential meters).*
- *From 3:00pm to 7:00pm:*
 - *100 percent of meters returning two register values.*
- *From 8:00pm to 11:00pm:*
 - *100 percent of meters returning network statistics.*

The transmit duty cycle for the average meter (transmitting 1,268 times per day) is 0.06 percent (53.14 seconds per day).

The maximum measured transmit duty cycle (transmitting 25,916 time per day) is 0.58 percent (497.8 seconds per day).

- I. How many of those times (average and maximum) are to transmit electric usage information?

This will vary depending on business process, which will determine how read schedules are set up. Typically, there are two or three scheduled reads for usage data from each meter in a 24-hour period.

While is theoretically possible to program an individual smart meter with its own read schedule, duty cycle, and electricity usage data measurement interval, that does not typically happen in practice and Duquesne Light has no plans to program individual smart meters with their own read schedule, duty cycle, and/or electricity usage data measurement interval. See Duquesne Light's supplemental response to Request 1(h) above for information regarding Duquesne Light's practices regarding read schedules.

The following items are theoretically programmable on a Smart Meter:

- *Energy Registers*
- *Demand Registers*
- *Demand Calculations*
- *Meter Display*
- *Load Profile*
- *Voltage Monitoring*
- *Instrumentation Profile*
- *Time of Use*
- *Self-Read*
- *Service Limiting*
- *HAN*
- *Events and Exceptions*
- *Security*

- ii. How many of those times (average and maximum) are for other purposes? What are those other purposes?

This will vary with business process, which will determine how read schedules are set up. Typically, there are two or three scheduled reads for purposes other than returning usage data from each meter in a 24-hour period. These are typically for doing a register read and/or events read. The balance of the transmissions are for network command and control: synchronization, security, data integrity and dynamic network resiliency.

See Duquesne Light's supplemental response to the preceding request.

- iii. What are the number of times (average and maximum) by type/category of transmission?

Detailed analysis of the type/category of transmissions has not been completed. One data point from the gathered field data is that, on average, the segmentation between meter data transmissions (scheduled and/or on-demand) and network command and control (synchronization, security, data integrity and dynamic network resiliency) is expected to be:

- Transmissions of meter data: 10%
- Transmissions for network command/control: 90%

Duquesne Light has not undertaken a detailed analyses of the type/category of transmissions, as requested by Complainants, and is unaware of any legal or regulatory obligation to do so. As stated previously, the transmit duty cycle data provided above are representative of Duquesne Light's deployment. See Duquesne Light's response to Request 1(f) and (h).

Duquesne Light has already responded to Complainants' request for the theoretical maximum number of transmissions that a Smart Meter can execute, and it reiterates that, even with a 100 percent transmit duty cycle (which is impossible), the meters are still fully compliant to the established FCC limits by a considerable margin.

- i. Under what scenarios does each version of Your Smart Meter transmit outside of the daily schedule, i.e., transmissions such as on-demand reads, tamper/theft alerts, last gasps, firmware upgrades, etc.?

Duquesne Light cannot reasonably determine what information is sought by the "etc." abbreviation and provides the following information in response to the remaining portions of Discovery Request #1(i):

- On-Demand Reads: These reads are outside of the daily read cycle and will be fully dependent on business processes. Each On-Demand read will generate one downstream and one upstream packet with average transmission duration of 125mSec.
 - *An on-demand read is a non-scheduled meter read of a customer's meter primarily used for attaining meter reading data for billing purposes, account activations or terminations, and supplier switching as well as potentially other business reasons.*
 - *The maximum frequency with which Duquesne Light could take on-demand reads would be every five minutes. That is a theoretical maximum that Duquesne Light has no plans to reach.*
- Tamper/Theft Alerts: These alerts vary based on the environment of the deployment. Each event will generate a single upstream packet with average transmission duration of 18 mSec.
- Last Gasp: This will be highly dependent on the frequency and extent of the power outages in the coverage area. Each meter will send three last gasp messages when a power outage is detected with average transmission duration of 18 mSec.
- Firmware Download: Firmware downloads over the RFLAN are typically done once a year (reflecting major system releases). The firmware download process is a background activity for the network

typically spanning from 12 hours to 12 days (depending on the number/type of firmware modules downloaded). Measurements at the Itron meter farm indicate the firmware download adds approximately 2% overhead to the network traffic. For example, a download of 347KB register firmware will take up to 8 days. On a 1G RFLAN system with 150 Byte packets, this results in:

- $347,000 \text{ Bytes}/150 \text{ Bytes/Pkt} = 2,313 \text{ Pkts}$
- $2,313 \text{ Pkts}/8 \text{ Days} = 289 \text{ Pkts/Day} (12 \text{ Pkts/Hour})$
- Each packet represents one downstream broadcast transmission of approximately 150 mSec.
- **Network Synchronization:** The nature of an RF mesh network requires that meters maintain communications with their neighbor meters to ensure the stability, self-healing and integrity of the network. A good example of this is timing synchronization where meters send their neighbor meters time-synchronization packets at regular intervals to ensure all of the devices in the network are synchronized for time slot usage. Time-synchronization packets are sent approximately every 93 seconds with average transmission duration of 18 mSec.
- *Duquesne Light is unable to identify the most frequently occurring transmission across its service territory because the frequency of specific types of transmissions is not a fixed parameter, but would vary depending on a meter's location within the network, other network traffic activity, and other factors.*
- *Because there is no Smart Meter at the property where Complainants reside, Duquesne Light is unable to say what is or would be the most frequently occurring transmission there.*

j. Typically, how much of the communication between the customer's Smart Meter

ii. and You (Duquesne Light) is unscheduled vs scheduled?

The majority of the communications between the customer's meter and the utility is based on scheduled data requests (interval data read, register reads, events read, network statistics read). The amount of communication for on-demand reads and events will be highly dependent on business processes and the environment of the deployment (e.g., outage and tamper events). The network overhead does not represent communication between a meter and the utility (i.e., does not route back to the head end system). These overhead transmissions are required for the proper operation of the dynamic, self-healing RF mesh. The 53 seconds that an average OpenWay meter transmits in one day includes all of the communications described above.

Additionally, a meter's location within the network influences how often that meter will transmit. Meters that are closer to the take-out point will have a higher transmit duty cycle than those that are located farther away. See also Duquesne Light's supplemental responses to the preceding requests.

- I. What is the amount of RF emission at the source of each version of Your Smart Meter when Your Smart Meter is transmitting data (instantaneous maximum peak level, averaged over 30 minutes)?

The limits for Maximum Permissible Exposure (MPE) established by the FCC account for a 20cm distance from the source to the measurement point. The RF emissions for the OpenWay meters deployed by Duquesne Light without this 20cm distance (at the antenna source) are:

900 MHz LAN Radio

- Transmitter Conducted Power: 28.38dBm, 688.65mW
- Antenna Gain: 2.2dBi
- Maximum System EIRP: 30.58dBm, 1142.88mW
- With 1 percent duty cycle over 30 minute interval: 1.143mW

2.4GHz Radio

- Transmitter Conducted Power: 18.13dBm, 65.01mW
- Antenna Gain: 3.8dBi
- Maximum System EIRP: 21.93dBm, 155.96mW
- With 1 percent duty cycle over 30 minute interval: 1.56mW

Note: The maximum observed duty cycle was 0.58%. This has been rounded up to 1 percent.

See also Duquesne Light's supplemental response to Requests 1(f) and (h).

- r. Since the SK9AMI7 is programmable, what control methods and capabilities do You have to change, adjust, or modify the Duty Cycle of the SK9AMI7 either directly or remotely?

The Duty Cycle of the Itron OpenWay meters has been established using a large population of deployed meters with a typical daily read schedule to ensure validity. This read schedule can be modified. Studies have not been undertaken to quantify the difference in Duty Cycle when the read schedule of the meters is modified. The expectation is that there will be minimal variance in the Duty Cycle with typical changes to read schedules.

See Duquesne Light's supplemental responses to the preceding requests, including 1(f), (h), and (h)(1).

t. Describe the function and operation of the Switch-Mode Power supply that supplies power to Your Smart Meter (the SK9AMI7?

The power supply is used to convert AC voltage to DC voltage to operate electronics in the meter. The HW 3.1 OpenWay Centron singlephase meter uses a capacitive switcher to drive a linear which then drives a buck convertor.

ii. What voltage spiking, harmonics, additional loads and stresses does this introduce onto the customer's household interior electrical wiring.

Interior electrical wiring is the responsibility of the customer and/or homeowner and can vary by location. The smart meters being installed within Duquesne Light's service territories comply with the limits established by the FCC and have been validated by several outside laboratories, including UL.

The Itron OpenWay meter meets ANSI C12.1 and FCC Part 15, Class B. ANSI C12.1 section 4.7.3.13 is a test intended to show compliance to the Code of Federal Regulations (CFR) 47, Part 15 Class B - unintentional radiators issued by the Federal Communications Commission for Class B emission limits. When a meter satisfies ANSI C12.1 and FCC Part 15, Class B, it is approved for customer consumption. Additionally, the voltages, harmonics, and loads the Smart Meter introduces into a residence are functionally similar to those imposed by the current meter at Complainants' service address. By way of further response, a copy of the conducted emissions test report (EMI Test Report dated June 22, 2011) is enclosed.

3.

a. What analyses, if any, did You carry out to ensure that the Radiofrequency (RF) radiation, and Low Frequency (LF) radiation induced by the Switch-Mode Power supply, from Your wireless Smart Meter system would be safe for all of Your customers, and those living at or visiting their Property?

See response to Discovery Request #3.

In addition to the response noted above, Duquesne Light has reviewed reports prepared by the Electric Power Research Institute ("EPRI"), which tested various smart meters made by Itron. The EPRI report titled "An Investigation of RF Fields Associated with the Itron Smart Meter" has already been produced. Furthermore, Smith and Fisher, LLC prepared a report titled "Report of Findings for Power Density Survey for Duquesne Light's Advanced Metering Project," which examined RF associated with pole-mounted data collection nodes for

the purposes of assessing impacts on Duquesne Light employees. A copy of this report is attached.

- b. Did your analysis/assessment consider the Radiofrequency (RF) radiation from a single wireless Smart Meter, or the radiation from all components of Your wireless Smart Meter system including
- i. all wireless Smart Meters in a community?
 - ii. all intermediate wireless relay devices in a community such as any wireless Collector Smart Meters and Repeaters?
 - iii. all wireless Transmitters/Receivers required to communicate between the intermediate wireless relay devices and Duquesne Light or its agents?

As required by the FCC, Itron assessed all of the active radios within the device. As with any other FCC-compliant device, Duquesne Light is not responsible for deployment of other devices in proximity of the meters. Itron has published a white paper that specifically addresses the levels of RF exposure from meter banks: "The Facts on RF Exposure from Meter Banks." A key factor highlighted in this paper is that the RF levels fall off very quickly over distance. This results in minimal additive levels of RF exposure from multiple devices in a given area.

Duquesne Light is not responsible for the deployment of other non-Duquesne Light devices near its meters. Duquesne Light thus deploys its smart meters regardless of whether other non-Duquesne Light RF devices are in proximity to its meters.

- e. Are customers/homeowners provided with any written notice of the dangers and inherent risks associated with being in close proximity to Your Smart Meter on a regular basis?

This request is argumentative and Duquesne Light disagrees with the premise of this request, which is that there is a danger and/or inherent risk of being in some undefined "close proximity" to the smart meters being installed throughout its service territory.

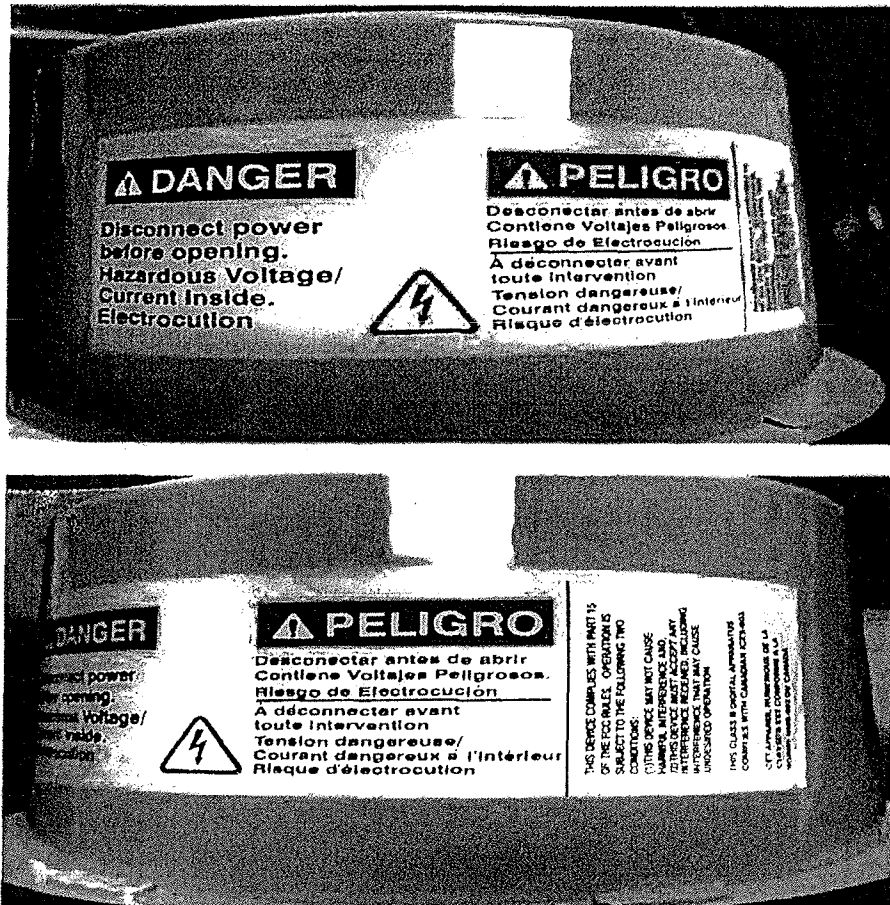
Information regarding Duquesne Light's smart meters are available on the company's website, including the "Smart Meter Q&A" document that was previously produced to Complainants.

Further, Duquesne Light installs its smart meters regardless of the human activity that occurs near the meter's location, unless such activity would negatively affect the integrity of the meter or the safety and reliability of Duquesne Light's facilities.

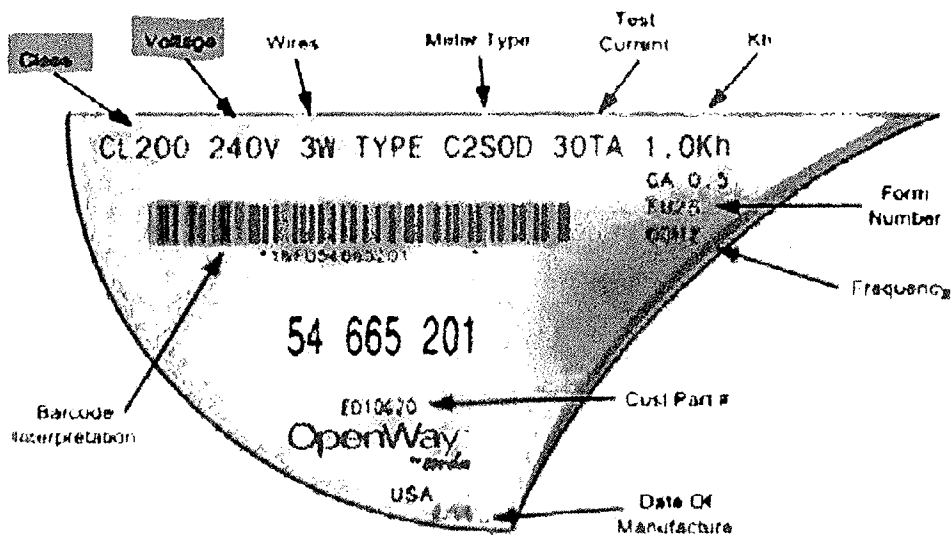
- ii. Are there warning labels on Your Smart Meters?

The Smart Meter contains a standard message that warns against introducing currents at voltages above the meter's design tolerance.

The label is depicted below:



The operating voltage is +/- 20% of the voltage indicated on the meter nameplate. The maximum current is the class of the meter (located on the meter nameplate). The voltage and class of the meter are based on the meter form installed. Most installations are Form 2S for residential customers; a nameplate of a 2S meter is included below:



By way of further response, see Itron's OpenWay CENTRON Singlephase Meter Technical Reference Guide, which is attached.

6.

a. What are the physical elements, components, and materials used in the construction of Your electrical Smart Meter? Electronic components? Circuit boards? Flammable materials?

The terms used in this request are vague. Duquesne Light offers the following table, which lists the common material used in the HW 3.1 OpenWay CENTRON meter:

CEN-II	
Component	Material
Base and Switch Cover	PET RYNITE FR 515
Outer Cover, Inner Covers, OEM Support and Register Display	Polycarbonate
Electrical components; resistors, capacitors, diodes, transistors, integrated chips (IC)	Common supported materials used to manufacture electrical components
Printed Circuit Boards	Fiberglass epoxy resin with copper foil

Further, although it is theoretically possible for almost any material to catch fire, it is Duquesne Light's position that the materials listed above do not pose an appreciable risk of catching fire. By way of further response, Duquesne Light is aware of no instance in which one of its Smart Meters has caught fire.

c. Can overheating of the electronic components and flammable materials inside of Your Smart Meters cause the components to degrade, expand, "pop", smoke, burst into flame, burn, and/or explode, with a single occurrence or repeatedly over time?

Duquesne Light cannot and will not speculate as to what might happen to the components of a smart meter based on a vague and unidentified set of facts. As noted by the responses to the preceding Discovery Requests, the smart meters being installed in Duquesne Light's service territory fall within the limits established by the FCC, have been tested and approved by UL, and the company's smart meter procurement and implementation plan has been approved by the Pennsylvania Public Utility Commission, which is prima facie evidence that it is reasonable, safe, and in compliance with the law.

Duquesne Light rejects the premise of this question that there flammable materials in its Smart Meters. Again, it is theoretically possible that almost any material could catch fire or overheat, but it is Duquesne Light's position that the materials in its Smart Meters pose no appreciable risk of catching fire or overheating. By way of further response, Duquesne Light is unaware of any instance in which one of its Smart Meters overheated and/or caught fire.

d. Does Your Smart Meter contain anything to warn the homeowner of overheating, fire danger, or explosion?

The Smart Meter contains a standard message that warns against introducing currents at voltages above the meter's design tolerance.

For the reasons set forth in its prior responses, Duquesne Light rejects the premise of this question such a warning is necessary. Again, it is theoretically possible that almost any material could catch fire or overheat, but it is Duquesne Light's position that the materials in its Smart Meters pose no appreciable risk of catching fire or overheating.

e. Has destructive testing been carried out on Your Smart Meter?

This question is so vague that Duquesne Light cannot reasonably be

expected to form a complete response, *but tests performed on the Smart Meters being used by Duquesne Light are referenced throughout Duquesne Light's original and supplemental discovery responses.*

9.

- d. If so, how is this inspection done and what does it involve? Are the age and condition of the customer's/homeowner's electrical system, wiring, and meter box bases considered and checked by a certified electrician prior to installation of Your Smart Meter to ensure that the sockets and house wiring is compatible with the installation of your Smart Meter?

Duquesne Light does not consult certified electricians prior to the meter exchange. By way of further response, see the response to Discovery Request #9(c).

- ii. How many residences have failed this inspection?

Through the course of the project, Wellington Energy has forwarded investigations at a rate of 0.5 percent consistently for Duquesne Light Specialist. In this 0.5 percent would be potential neutral connection concerns.

By way of further response, see the enclosed document titled "Copy of RTU Numbers 1," which is the most recent data that Duquesne Light has regarding Smart Meters that were returned to the utility, the reasons for the return, and whether the company has been able to complete an installation of a Smart Meter at the subject premise. Each RTU Code is listed at the bottom of the document.

- iii. What are the observed frequencies and occurrences of
- aa. damage or melting around the meter tabs/blades?
 - bb. pitting in the socket jaws?
 - cc. loss of spring tension in the socket jaws?
 - dd. oxidation on the lug wires?
 - ee. evidence of arcing?
 - ff. sockets that are unsafe or not up to code?
 - gg. other abnormal conditions?

The 0.5 percent investigation referenced in the response to Discovery Request #9(d)(ii) above includes the conditions stated in Discovery Request #9(d)(iii)(aa)-(gg).

By way of further response, see the attached document titled "Copy of RTU Numbers 1."

iv. What other safety related issues have been observed?

Duquesne Light does not specifically itemize the socket conditions.

By way of further response, see the attached document titled "Copy of RTU Numbers 1."

18.

c. If this personal data is to be used for other than billing purposes, what are those purposes, and will this be done only with the knowledge and written consent of the customer/homeowner?

The Pennsylvania Public Utility Commission requires Duquesne Light to provide an Eligible Customer List (ECL), comprising certain customer information, to qualified electric generation suppliers (EGSs). Customers can opt to be removed from the ECL. ECL requirements predate, and are not associated with, Duquesne Light's Smart Meter system. For more information about the ECL, visit the Public Utility Commission's website at:

http://www.puc.state.pa.us/utility_industry/electricity/electric_competitive_market_oversight.aspx

By way of further response, Duquesne Light uses the data collected from its meters for more than billing purposes, including for operational purposes, remote connect and disconnect, and power quality studies.

TUCKER ARENSBERG, P.C.

By: 

Jeremy V. Farrell, Esquire
PA. ID. No. 316258
Paul Shane Miller, Esquire
PA. ID. No. 319174
1500 One PPG Place
Pittsburgh PA 15222
(412) 566-1212

Counsel for Respondent,
Duquesne Light Company

VERIFICATION

I, Michael D. Secchiutti, hereby state that the statements made in Respondent's Third Supplemental Responses to Set #1 of Discovery Requests are true and correct to the best of my knowledge, information and belief. The undersigned understands that the statement herein is made subject to the penalties of 18 Pa.C.S. Section 4904, related to unsworn falsification to authorities.

Dated: 4-13-2018



Michael D. Secchiutti

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainants,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

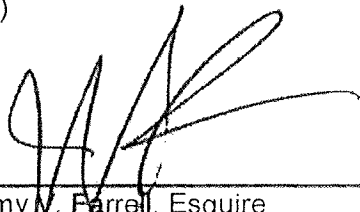
No: C-2016-2571726

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the foregoing Duquesne Light's Third Supplemental Responses to Complainants' Set #1 of Discovery Requests was served upon the participant listed below via email and overnight mail in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant):

Michele Hriadil and Francis Hriadil
331 Shady Ridge Drive
Monroeville, PA 15146
Via Email - hriadil@attglobal.net
And Fed Ex Overnight
(Saturday delivery)

Dated this 13th day of April, 2018



Jeremy V. Farrell, Esquire
PA I.D. No. 316258
jfarrell@tuckerlaw.com
Paul Shane Miller, Esquire
PA I.D. No. 319174
smiller@tuckerlaw.com
1500 One PPG Place
Pittsburgh, PA 15222
(412) 566-1212
(412) 594-5619 (fax)
Counsel for Respondent,
Duquesne Light Company

Appendix Tab 8

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainants,

No: C-2016-2571726

v.

DUQUESNE LIGHT COMPANY,

Respondent.

**AFFIDAVIT OF BENJAMIN COTTS,
PhD., P.E. IN SUPPORT OF MOTION
FOR SUMMARY JUDGMENT**

Served on Behalf of Respondent
Duquesne Light Company

Counsel of Record for this Party:

Jeremy V. Farrell, Esquire
Pa. I.D. No. 316258

Paul Shane Miller, Esquire
Pa. I.D. No. 319174

Tucker Arensberg, P.C.
1500 One PPG Place
Pittsburgh PA 15222
(412) 566-1212

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainants,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

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No: C-2016-2571726

AFFIDAVIT OF BENJAMIN COTTS, PhD., P.E.
IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT

PRINCE GEORGE'S COUNTY)

) ss:

STATE OF MARYLAND)

Benjamin Cotts, PhD, P.E., being duly sworn, deposes and says:

1. I am a Senior Managing Engineer in the Electrical Engineering and Computer Science Practice at Exponent Inc., an international science and engineering firm.

2. I have been retained by Duquesne Light Company ("Duquesne Light") to offer expert testimony and opinions on its behalf in this case. A true and accurate copy of my expert report is attached to this Affidavit as Exhibit 1. My educational background, qualifications, and curriculum vitae are set forth in Appendix A to Exhibit 1.

3. I earned my Bachelor of Science degree (summa cum laude) in Electrical Engineering from the University of Portland and a Master's of Science degree and a Doctor of Philosophy Degree in Electrical Engineering from Stanford University. I am a member of several technical organizations, including the Institute of Electrical and Electronics Engineers (IEEE), the International Council on Large Electric Systems, the IEEE Power Engineering Society Corona and Field Effects Working Group, and the International Committee on Electromagnetic Safety, Subcommittees 3 and 4.

4. I have expertise in applied and theoretical electromagnetics including modeling, measurement, and analysis studies of natural and manmade radiofrequency (RF) fields and regularly assist clients in evaluating RF fields from a number of sources, including smart meter networks.

5. I have reviewed many documents in connection with this case, including Duquesne Light's Responses and Third Supplemental Responses to Complainants' Set #1 Discovery Requests and Third Supplemental Response to Complainants' Set #1 Discovery Requests, both of which contained information about the operation, duty cycle, and read schedules (among other things) of the smart meters being deployed by Duquesne Light in its service territory. I also reviewed Complainants' Responses to Duquesne Light's Second Set of Discovery Requests, which indicate that Complainants use the following devices in their home that emit radiofrequency or low frequency fields: a Verizon Samsung Note 3 cell phone, Verizon FIOS Wi-Fi router, Dell laptop, a custom built Netgear desktop computer, and Microsoft Xbox 360.

6. I am familiar with the Federal Communications Commission's (FCC) exposure limit for RF, which are codified in the Code of Federal Regulations Title 47 (§1.1310 and §2.1093). Those exposure limits are based upon the recommendations of organizations such as the National Council for Radiation Protection and the IEEE, with input from various federal health agencies like the Environmental Protection Agency, the National Institute for Occupational Safety and Health, and the Occupational Safety and Health Administration.

7. The IEEE developed these health-based exposure limits for electromagnetic fields through a comprehensive review of scientific literature, a process which was also undertaken by other international agencies like the International Commission on Non-Ionizing Radiation Protection (ICNIRP). Additional information about the background for the above standards can be found in my expert report. Exhibit 1 at pp. 13-14.

8. The FCC limits for the general public at frequencies of smart meter transmissions (900M Hz and 2.4 GHz) are summarized in the following chart, along with the current IEEE and ICNIRP standards.

Agency	Power Density Limit at 900 MHz (W/m ²)	Power Density Limit at 2.4 GHz (W/m ²)	Specific Absorption Rate (SAR) limit (W/kg)
FCC (CFR §§ 1.1310 and 2.1093)	6	10	0.08 (whole body) 1.6 (over any 1 gram of tissue)
ICNIRP (1998)	4.5	10	0.08 (whole body) 2 (over any 10 gram of tissue)
IEEE (C95.1, 2005)	4.5	10	0.08 (whole body) 2 (over any 10 gram of tissue)

These limits are explained in more detail in Exhibit 1 at pp. 13-14.

9. The smart meters being deployed by Duquesne Light comply with the above standards.

10. Even assuming that Duquesne Light's smart meters transmitted constantly (i.e. a 100 percent duty cycle), the 900 MHz LAN radio on the meters constitutes only 38 percent of the FCC limit and the 2.4 GHz Zigbee radio amounts to only 3.1 percent of the FCC limit. See Exhibit 1 at pp. 15-16 for more background about these calculations.

11. Using the average duty cycle of 0.06 percent for a typical Duquesne Light smart meter (identified in Duquesne Light's Response and Third Supplemental Response to Request No. 1(f) in Complainants' Set #1 Discovery Requests), the RF exposure for the 900 MHz LAN radio (which is the higher-power radio of the two that are in Duquesne Light's smart meters, as noted in the preceding paragraph) at 1 yard directly in front of the smart meter outside is 0.0029 percent (1/35,000th) of the FCC limit and at 1 yard behind the smart

meter inside is 0.00013 percent (1/780,000th) of the FCC limit. See Exhibit 1 at pp. 17-20 for more background about these calculations.

12. Utilizing the data contained in the material described above and in other materials identified in my report, I have reached the following opinions and conclusions within a reasonable degree of scientific certainty, which are all explained in greater detail throughout my expert report:

a. The Smart Meters operated by Duquesne Light will represent a negligible contribution to the overall RF exposure of Complainants;

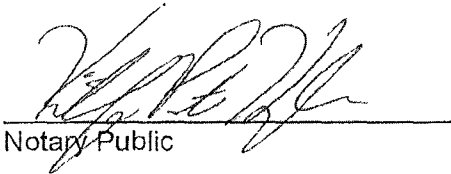
b. The RF exposures from other existing sources both inside and outside the residence are many times greater than from a typical Duquesne Light smart meter; and

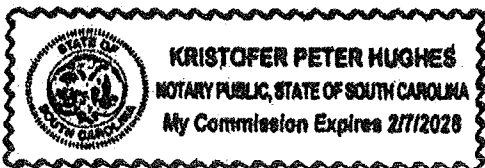
c. The RF exposure from a typical Duquesne Light smart meter, whether evaluated inside or outside of Complainants' residence, represent a fraction of the allowable FCC limit and complies with applicable industry standards.

See Exhibit 1 at pp. ix.


Benjamin Cotts, PhD, PE

Sworn to before me this 1 day of
June 2018.


Notary Public



Appendix Tab 9

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

RESPONSE TO RESPONDENT'S
FIRST SET OF DISCOVERY
REQUESTS DIRECTED TO
COMPLAINANTS

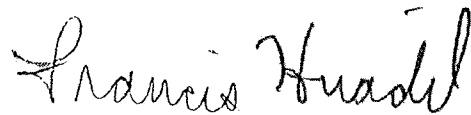
Filed by Michele and Francis Hriadil

hriadil@attglobal.net
(412) 779-3314
331 Shady Ridge Drive
Monroeville, PA 15146

RESPONSE TO RESPONDENT'S
FIRST SET OF DISCOVERY REQUESTS DIRECTED TO COMPLAINANTS

THIS IS COMPLAINANTS RESPONSE TO RESPONDENT'S FIRST SET OF DISCOVERY REQUESTS.

A COPY OF THIS MATERIAL HAS BEEN SENT TO ALJ JEFFREY A WATSON, AND A CERTIFICATE OF SERVICE HAS BEEN FILED WITH THE COMMISSION'S SECRETARY, PER JUDGE WATSON'S OCTOBER 3, 2017 INTERIM ORDER.



Francis Hriadil
October 26, 2017

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

**RESPONSE TO RESPONDENT'S
FIRST SET OF DISCOVERY REQUESTS DIRECTED TO COMPLAINANTS**

TO THE RESPONDENT:

This submission comprises the Complainants response to the Respondent's First Set of Discovery Requests Directed to Complainants.

It includes:

- this main document,
 - which addresses the Respondent's specific Discovery questions,
 - and includes a list of the documents and references, and their sources, we have already submitted in our previous filings to date;
- plus, documents, references, and sources, not previously provided, or not previously provided in full, that we intend to offer into evidence:
 - Discovery Request 4 - 30 Exhibit Documents, **E-1 to E-30**.
 - Discovery Request 6 - 16 Exhibit Documents, **F-1 to F-16**.
 - Discovery Request 9 - 10 Exhibit Documents, **G-1 to G-10**.
 - Discovery Request 13 - 4 Curriculum Vitae Documents, **CV-1 to CV-4**.

Complainants have made a conscientious and concerted effort to respond to the Respondent's specific Discovery questions to the best of our ability at this time. If any new documents are acquired, or any new developments occur, the Respondent will be notified and updated in as timely of a manner as possible.

Complainants are submitting this response in accordance with 52 Pa. Code S 1.36.

DISCOVERY REQUESTS

1. State all facts that support Your claim that Duquesne Light's installation of a Smart Meter at the Property will negatively affect Michele Hriadil's health or medical condition(s), as alleged throughout Your Formal Complaint.

ANSWER:

Our facts for this claim have already been presented, with Exhibits and Supporting Documents, in our prior filings. They include, but are not limited to:

- Complainant's Formal Complaint, filed and dated October 1, 2016
- Complainant's Response to Respondent's Preliminary Objections to Formal Complaint, filed and dated November 29, 2016
- Complainant's Response Addendum to Respondent's Corrected Preliminary Objections to Formal Complaint, filed and dated December 19, 2016
- Complainant's Response to Respondent's Answer and New Matter to Formal Complaint, filed and dated January 9, 2017
- Complainant's Response to Respondent's Answer in Opposition to Complainant's Motion for Summary Judgment, file and dated January 20, 2017
- Complainant's Correction to Pulse Transmission Table in Complainant's Response to Respondent's Answer and New Matter to Formal Complaint, filed and dated January 24, 2017
- Complainant's Notice to Plead New Matter, filed and dated January 24, 2017
- Complainant's Notice to Plead New Matter #2, filed and dated January 27, 2017
- Complainant's Notice to Plead New Matter #3, filed and dated February 3, 2017
- Complainant's Notice to Plead New Matter #4, filed and dated February 14, 2017

These are all incorporated here-in by reference as if fully restated.

To re-iterate, human beings are electrical beings. Our bodies possess a biological electrical grid which is the nervous system. Every cell in the human body has an electric field. And, there are trillions of electrical connections in the human body grid. Every function in the human body depends on the body's natural, internal electrical signals. The human body is also a human receiving antenna. Its cells cannot stop receiving the signals coming from a Smart Meter, etc. Its cells are disturbed by these signals. And, its cells are not compatible with these signals. Any electrical disruption and failure that the human body suffers at the cellular level leads to disease processes.

The published literature of the international biomedical research community on the adverse effects of RF and associated LF radiation is so vast that it would be impossible to present it all here. As a small sample, there are 3 very wide-ranging reviews of this literature which have made the findings more accessible:

(1) The most massive review is the 1479-page BioInitiative 2012 Report, published in December 2012, which considered about 1800 biomedical research publications issued in the last five years. The BioInitiative 2012 Report was prepared by an international body of 29 experts, heavy in Ph.D.s and M.D.s, from 10 countries, including the USA which contributed the largest contingent of experts. It has stated quite emphatically over many years that

electromagnetic (EM) and radiofrequency (RF) fields remain thousands of times higher than exposure levels which health studies consistently show to be associated with serious health impact.

(2) A group of 6 doctors in Oregon, led by Paul Dart, M.D., published, in June 2013, their own 74-page review of 279 biomedical research publications entitled, "Biological and Health Effects of Microwave Radio Frequency Transmissions, A Review of the Research Literature". This review makes the health case against the installation of Wireless Smart Meters, explicitly. The review recommends that levels of RF radiation must be lowered to protect public health, not raised by the installation of Wireless Smart Meters.

(3) Michael Bevington, in 2013, published a book, entitled "Electromagnetic Sensitivity and Electromagnetic Hypersensitivity: A Summary", that summarizes the findings of 1828 biomedical research publications. The book describes the symptoms caused by exposure to electromagnetic radiation, the many diseases associated with such exposure, and the relative risk levels associated with specific sources of electromagnetic radiation. Wireless Smart Meters are in the highest of those risk categories.

The above literature reviews, as well as many other experts, associations, organizations, etc., have established that some groups of individuals are at especially high risk of harm from exposure to RF and LF radiation: pregnant women and their unborn children, very young children, teenagers, men of reproductive age, seniors (of which I am one), and anyone with a chronic health condition. Members from all of these groups (including but not limited to myself, family members, children, friends, and pets), with various health and medical conditions, either live at or have occasion to visit our residence on a regular basis. There is also a family history of certain chronic conditions which are relevant.

In addition, the facts include but are not limited to:

- The SK9AMI7 Smart Meter produces 1,000s - 10,000s of pulsed (strobe-like) transmissions on a regular basis throughout the day, which produces RF radiation in all directions.
- The SK9AMI7 Smart Meter uses a Switch-Mode Power Supply (AC/DC switching circuitry) to draw power from the homeowner's electrical line.

This introduces voltage spiking and harmonics in the homeowner's interior electrical wiring, which causes the homeowner's interior electrical wiring to emit pulsed LF radiation throughout the interior of the homeowner's residence every time it draws power.

- Recognizing that established science indicates there are many conditions that can affect and influence Radiofrequency (RF) and Low Frequency (LF) radiation levels in the home environment, no assessment, account, or accommodation is provided by the Respondent for
 - uncertainties about the existing RF environment that exist at a location, such as how much RF exposure already exists at a location.
 - what kind of reflective and re-radiation interior and exterior environments exist at a location? (It is established science that reflections and re-radiation can occur from common building materials ((tile, concrete, stainless steel, glass, ceramics, etc.)) and highly reflective appliances and furnishings that are common in kitchens, etc.)

- how interior and exterior space is utilized near walls where the Smart Meters are mounted?
 - the specific physical condition(s) of the residents, and all likely visitors to the residence, including but not limited to age, medical condition(s), disabilities, medical implants, relative health, reliance on critical care equipment that may be subject to electronic interference, etc.?
 - the location of the Smart Meter on the residence in close proximity to, or in co-location with, other Smart Meters on the same building, such as with connected condominiums (like the Complainant's Property), apartment buildings, etc.?
 - unrestrained access to areas of the Property where their Smart Meter(s) are located.
- Homeowners and residents are not provided with any written notice of the dangers and inherent risks associated with being in close proximity to the Smart Meter on a regular basis.
 - No safety barrier provided to ensure and maintain the required safe separation distance for all persons, children, animals, etc.
 - Similarly, no warning labels are provided on the Smart Meters.
 - The International Agency for Research into Cancer (IARC), which is part of the World Health Organization (WHO), has determined that Radiofrequency (RF) Electromagnetic Fields (the sort given off by Smart Meters, etc.) belong to the "Group 2B" class of agents, such as lead, engine exhaust, and DDT, and as such, represent a potential "carcinogenic hazard".
 - The National Toxicology Program (NTP), a federal interagency group under the National Institutes of Health (NIH) has released definitive evidence that pulsed RF radiation exposure, at frequencies, intensities, and modulations emitted from cell phones and Smart Meters, causes tumor formation and DNA damage.
 - This has been recognized as significant by the American Cancer Society (ACS), etc., and has been verified in other studies.

Specifically, Michele Hriadil is elderly and generally in good health, and desires to stay that way.

Concerning health and medical conditions:

- i. First and foremost, the objective is the prevention of harm, and the prevention of further harm.

"An ounce of prevention is worth a pound of cure" is not simply an irrelevant and antiquated principle. It is a health principle fully supported and endorsed in the US Constitution, and by the US Government, in the National Prevention Council's National Prevention Strategy, and by the US Surgeon General, in the PA Constitution, and by the PA Government, in the Public Utility and Safety Codes, and by the PA PUC.

As an example, one need only refer to the National Prevention Council's published National Prevention Strategy document, which

- establishes the role and responsibility of federal, state, etc. policy makers and officials in prevention
- sets the strategic direction and priorities as:
 - establishing healthy and safe community environments, with the top 2 priorities here being:
 - the improvement of the quality of the environment (air, land, water, etc.)
 - the design and promotion of affordable, accessible, safe, and healthy housing Healthy and Safe Community Environments
 - empowering people, with the top 3 priorities here being:
 - encourage people to make healthy choices
 - support healthy decision making
 - engage and empower people and communities to plan and implement prevention policies and programs
 - promoting physical, mental, and emotional well-being
- and documents how prevention can reduce the significant economic burden of disease on the individual and the healthcare system, in addition to improving the length and quality of people's lives

- ii. We live in a connected condominium building structure containing 6 connected units. Our residence has 2 shared common walls, one is our right wall and the other is our left wall. Both adjoining units already have SK9AMI7 Smart Meters installed and operating in those units. So, we are already being exposed to regular RF and LF radiation leakage due to the close and immediate proximity of those walls, units, and meters.
- iii. Furthermore, most if not all of the entire neighborhood has had the SK9AMI7 Smart Meters installed. So, we are already being exposed to regular RF and LF radiation whenever we venture out and around the neighborhood, which we now rarely do. Thus, to protect ourselves and minimize our exposure, the quality of our lives has already been negatively impacted in a significant way.

2. Produce all Documents, including but not limited to hospital and/or medical records and studies, that relate to Your answer to Discovery Request No. 1.

ANSWER:

Relevant Documents:

a. Hospital and/or Medical Records:

Michele Hriadil - Elderly, age: 62

Michele Hriadil is generally in good health. Her specific health and medical records are her personal information which is protected under HIPPA, and we will protect them. Since the PUC Administrative Law Court hearing is a matter of public record, we do not want our personal medical records made public information during any level in these proceedings, as is our fundamental right.

Parents Medical History:

Mother: History of Cardiomyopathy

Father: History of Chronic Obstructive Lung Disease

What records are required by the court to verify the above stated conditions will be supplied to Judge Watson for his direct personal review.

b. Other Relevant Documents:

Are provided in our response to Discovery Request No. 4.

3. State all facts that support Your claim that Duquesne Light's installation of a Smart Meter at the Property will negatively affect Francis Hriadil's health or medical condition(s), as alleged throughout Your Formal Complaint.

ANSWER:

As in 1., our facts for this claim have already been presented, with Exhibits and Supporting Documents, in our prior filings. They include, but are not limited to:

- Complainant's Formal Complaint, filed and dated October 1, 2016
- Complainant's Response to Respondent's Preliminary Objections to Formal Complaint, filed and dated November 29, 2016
- Complainant's Response Addendum to Respondent's Corrected Preliminary Objections to Formal Complaint, filed and dated December 19, 2016
- Complainant's Response to Respondent's Answer and New Matter to Formal Complaint, filed and dated January 9, 2017
- Complainant's Response to Respondent's Answer in Opposition to Complainant's Motion for Summary Judgment, file and dated January 20, 2017
- Complainant's Correction to Pulse Transmission Table in Complainant's Response to Respondent's Answer and New Matter to Formal Complaint, filed and dated January 24, 2017
- Complainant's New Matter, filed and dated January 24, 2017
- Complainant's New Matter #2, filed and dated January 27, 2017
- Complainant's New Matter #3, filed and dated February 3, 2017
- Complainant's New Matter #4, filed and dated February 14, 2017

These are all incorporated here-in by reference as if fully restated.

Also as in 1., human beings are electrical beings. Our bodies possess a biological electrical grid which is the nervous system. Every cell in the human body has an electric field. And, there are trillions of electrical connections in the human body grid. Every function in the human body depends on the body's natural, internal electrical signals. The human body is also a human receiving antenna. Its cells cannot stop receiving the signals coming from a Smart Meter, etc. Its cells are disturbed by these signals. And, its cells are not compatible with these signals. Any electrical disruption and failure that the human body suffers at the cellular level leads to disease processes.

The published literature of the international biomedical research community on the adverse effects of RF and associated LF radiation is so vast that it would be impossible to present it all here. As a small sample, there are 3 very wide-ranging reviews of this literature which have made the findings more accessible:

(1) The most massive review is the 1479-page BioInitiative 2012 Report, published in December 2012, which considered about 1800 biomedical research publications issued in the last five years. The BioInitiative 2012 Report was prepared by an international body of 29 experts, heavy in Ph.D.s and M.D.s, from 10 countries, including the USA which contributed the largest contingent of experts. It has stated quite emphatically over many years that electromagnetic (EM) and radiofrequency (RF) fields remain thousands of times higher than exposure levels which health studies consistently show to be associated with serious health impact.

(2) A group of 6 doctors in Oregon, led by Paul Dart, M.D., published, in June 2013, their own 74-page review of 279 biomedical research publications entitled, "Biological and Health Effects of Microwave Radio Frequency Transmissions, A Review of the Research Literature". This review makes the health case against the installation of Wireless Smart Meters, explicitly. The review recommends that levels of RF radiation must be lowered to protect public health, not raised by the installation of Wireless Smart Meters.

(3) Michael Bevington, in 2013, published a book, entitled "Electromagnetic Sensitivity and Electromagnetic Hypersensitivity: A Summary", that summarizes the findings of 1828 biomedical research publications. The book describes the symptoms caused by exposure to electromagnetic radiation, the many diseases associated with such exposure, and the relative risk levels associated with specific sources of electromagnetic radiation. Wireless Smart Meters are in the highest of those risk categories.

The above literature reviews, as well as many other experts, associations, organizations, etc., have established that some groups of individuals are at especially high risk of harm from exposure to RF and LF radiation: pregnant women and their unborn children, very young children, teenagers, men of reproductive age, seniors (of which I am one), and anyone with a chronic health condition (of which I am one). Members from all of these groups (including but not limited to myself, family members, children, friends, and pets), with various health and medical conditions, either live at or have occasion to visit our residence on a regular basis. There is also a family history of certain chronic conditions which are relevant.

In addition, the facts include but are not limited to:

- The SK9AMI7 Smart Meter produces 1,000s - 10,000s of pulsed (strobe-like) transmissions on a regular basis throughout the day, which produces RF radiation in all directions.
- The SK9AMI7 Smart Meter uses a Switch-Mode Power Supply (AC/DC switching circuitry) to draw power from the homeowner's electrical line.
- This introduces voltage spiking and harmonics in the homeowner's interior electrical wiring, which causes the homeowner's interior electrical wiring to emit pulsed LF radiation throughout the interior of the homeowner's residence every time it draws power.
- Recognizing that established science indicates there are many conditions that can affect and influence Radiofrequency (RF) and Low Frequency (LF) radiation levels in the home environment, no assessment, account, or accommodation is provided by the Respondent for
 - uncertainties about the existing RF environment that exist at a location, such as how much RF exposure already exists at a location.
 - what kind of reflective and re-radiation interior and exterior environments exist at a location? (It is established science that reflections and re-radiation can occur from common building materials ((tile, concrete, stainless steel, glass, ceramics, etc.)) and highly reflective appliances and furnishings that are common in kitchens, etc.)
 - how interior and exterior space is utilized near walls where the Smart Meters are mounted?

- the specific physical condition(s) of the residents, and all likely visitors to the residence, including but not limited to age, medical condition(s), disabilities, medical implants, relative health, reliance on critical care equipment that may be subject to electronic interference, etc.?
 - the location of the Smart Meter on the residence in close proximity to, or in co-location with, other Smart Meters on the same building, such as with connected condominiums (like the Complainant's Property), apartment buildings, etc.?
 - unrestrained access to areas of the Property where their Smart Meter(s) are located.
- Homeowners and residents are not provided with any written notice of the dangers and inherent risks associated with being in close proximity to the Smart Meter on a regular basis.
 - No safety barrier provided to ensure and maintain the required safe separation distance for all persons, children, animals, etc.
 - Similarly, no warning labels are provided on the Smart Meters.
 - The International Agency for Research into Cancer (IARC), which is part of the World Health Organization (WHO), has determined that Radiofrequency (RF) Electromagnetic Fields (the sort given off by Smart Meters, etc.) belong to the "Group 2B" class of agents, such as lead, engine exhaust, and DDT, and as such, represent a potential "carcinogenic hazard".
 - The National Toxicology Program (NTP), a federal interagency group under the National Institutes of Health (NIH) has released definitive evidence that pulsed RF radiation exposure, at frequencies, intensities, and modulations emitted from cell phones and Smart Meters, causes tumor formation and DNA damage.
 - This has been recognized as significant by the American Cancer Society (ACS), etc., and has been verified in other studies.

Specifically, Francis Hriadil is elderly and currently has chronic musculoskeletal and digestive conditions that would be adversely affected by continued and increased exposure to RF and LF radiation. I have also noticed a recent increase in Tinnitus, which I am in the process of having medically evaluated. So, the objective here is preventing any worsening of these chronic conditions, and preventing the occurrence of any other health and quality of life issues. There is also a family history of certain chronic conditions which are relevant.

As in 1., concerning health and medical conditions:

- i. First and foremost, the objective is the prevention of harm, and the prevention of further harm.

"An ounce of prevention is worth a pound of cure" is not simply an irrelevant and antiquated principle. It is a health principle fully supported and endorsed in the US Constitution, and by the US Government, in the National Prevention Council's National Prevention Strategy, and by the US Surgeon General, in the PA Constitution, and by the PA Government, in the Public Utility Code, and by the PA PUC.

As an example, one need only refer to the National Prevention Council's published National Prevention Strategy document, which

- establishes the role and responsibility of federal, state, etc. policy makers and officials in prevention
- sets the strategic direction and priorities as:
 - establishing healthy and safe community environments, with the top 2 priorities here being:
 - the improvement of the quality of the environment (air, land, water, etc.)
 - the design and promotion of affordable, accessible, safe, and healthy housing Healthy and Safe Community Environments
 - empowering people, with the top 3 priorities here being:
 - encourage people to make healthy choices
 - support healthy decision making
 - engage and empower people and communities to plan and implement prevention policies and programs
 - promoting physical, mental, and emotional well-being
- and documents how prevention can reduce the significant economic burden of disease on the individual and the healthcare system, in addition to improving the length and quality of people's lives

- ii. We live in a connected condominium building structure containing 6 connected units. Our residence has 2 shared common walls, one is our right wall and the other is our left wall. Both adjoining units already have SK9AMI7 Smart Meters installed and operating in those units. So, we are already being exposed to regular RF and LF radiation leakage due to the close and immediate proximity of those walls, units, and meters.
- iii. Furthermore, most if not all of the entire neighborhood has had the SK9AMI7 Smart Meters installed. So, we are already being exposed to regular RF and LF radiation whenever we venture out and around the neighborhood, which we now rarely do. Thus, to protect ourselves and minimize our exposure, the quality of our lives has already been negatively impacted in a significant way.

4. Produce all Documents, including but not limited to hospital and/or medical records, that relate to Your answer to Discovery Request No. 3.

ANSWER:

Relevant Documents:

a. Hospital and/or Medical Records:

Francis Hriadil - Elderly, age: 66

Francis Hriadil's specific health and medical records are his personal information which is protected under HIPPA, and we will protect them. Since the PUC Administrative Law Court hearing is a matter of public record, I do not want my personal medical records made public information during any level in these proceedings, as is my fundamental right.

In 2011, Francis Hriadil was diagnosed with ongoing conditions:

- Severe Degenerative Disc Disease of All Discs of the Lumbar Spine with Severe Degenerative Levoscoliosis.
- Degenerative Joint Disease of the Right Hip.
- Lumbar Radiculopathy.
- Colitis.
- Palpitations (racing heart) with tachycardia, due to sinus tachycardia.

Parents Medical History:

Mother: History of Cardiomyopathy

Father: History of Chronic Obstructive Lung Disease

What records are required by the court to verify the above stated conditions will be supplied to Judge Watson for his direct personal review.

b. In Addition to the above, and the Documents that have already submitted, we submit the following Additional and Expanded Relevant Documents:

- Exhibit E-7: BioInitiative 2012 Report.

BioInitiative Report: A Rationale for Biologically-based Public Exposure Standards for Electromagnetic Radiation, December 31, 2012. BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors. This is a 1479 page document. I do not have the complete document in my possession, and it would be prohibitive to print it all out; but, all 1479 pages are available online for detailed review at any time. Many experts have summarized, reported, and referenced the Report's conclusions and recommendations, in other documents that have been supplied here. It is readily available in its entirety at [<http://www.bioinitiative.org>].

- Exhibit E-2: Biological and Health Effects of Microwave Radio Frequency Transmissions, A Review of the Research Literature, A Report to the Staff and Directors of the Eugene Water and Electric Board, June 4, 2013. This 87 page review is posted on the website of the Federal Communications Commission (FCC) at (<http://apps.fcc.gov/ecfs/comment/view?id=6017465430>), along with other related filings by Dr Dart, which are available for public review. It is publicly available at (<https://ecfsapi.fcc.gov/file/7520940903.pdf>).
- Electromagnetic Sensitivity and Electromagnetic Hypersensitivity: A Summary, 2013, Michael Bevington. I do not have this specific document in my possession. I am trying to get copies in time for the Hearing. Many experts have summarized, reported, and referenced its conclusions and recommendations in other documents that have been supplied here. It is available at (<http://www.es-uk.info>)
- National Prevention Council's National Prevention Strategy, US Surgeon General. This is a 125 page document. I do not have this specific document in my possession. It would not be practical to supply this document in its totality here. Nevertheless, it is publicly available online for complete review at (<https://www.surgeongeneral.gov/priorities/prevention/strategy/report.pdf>).
- Exhibit E-3: Analysis by Francis Hriadil of the Pulse Transmissions of the SK9AMI7 Smart Meter.
- Exhibit E-4: Comparison by Francis Hriadil of What the FCC Did and Did Not Do.
- Exhibit E-5: Comparison by Francis Hriadil of a Non-emitting Analog Meter and the Wireless Smart Meter.
- Exhibit E-6: Letter to the PA PUC Concerning the Adverse Health Effects Associated with Exposure to RF radiation, etc. from Smart Meters, from Dr. David O. Carpenter, M.D., Director of the Institute for Health and the Environment, University of Albany.
- Exhibit E-7: American Academy of Environmental Medicine (AAEM) Official Recommendations Regarding Electromagnetic and Radiofrequency Exposures.
[<https://www.aaemonline.org/pdf/AAEMEMFmedicalconditions.pdf>]
- Exhibit E-8: International Agency for Research on Cancer (IARC) of the World Health Organization (WHO) classifies Radiofrequency (RF) Electromagnetic Fields as a Group 2B to be a pollutant, such as lead, engine exhaust, and DDT.
[http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf]

- **Exhibit E-9:** American Academy of Pediatrics (AAP) official statement advocating more stringent standards for RF exposure to better protect the public.
[<https://www.scribd.com/document/118348085/AAP-Supports-Child-Cell-Phone-Protection>]
- **Exhibit E-10:** A Message to the Maryland General Assembly - The Health Argument for Replacing Wireless Smart Meters with a Safe Metering Technology in Maryland. Ronald M Powell, PHD.
[<https://www.scribd.com/document/289787721/The-Health-Argument-for-Replacing-Wireless-Smart-Meters-with-a-Safe-Metering-Technology-in-Maryland>]
- **Exhibit E-11:** Symptoms after Exposure to Smart Meter Radiation. Ronald M Powell, PHD.
[<https://www.scribd.com/doc/289777267/Symptoms-after-Exposure-to-Smart-Meter-Radiation>]
- **Exhibit E-12:** Ranking Electricity Meters for Risk to Health, Privacy, and Cyber Security. Ronald M Powell, PHD.
[<https://www.scribd.com/document/289782183/Ranking-Electricity-Meters-for-Risk-to-Health-Privacy-and-Cyber-Security>]
- **Exhibit E-13:** Symptoms Resulting from Exposure to Radiofrequency / Microwave Radiation from Smart Meters. Ronald M Powell, PHD.
[<https://www.scribd.com/doc/291507139/Symptoms-Resulting-from-Exposure-to-Radiofrequency-Microwave-Radiation-from-Smart-Meters>]
- **Exhibit E-14:** Annotated References on Wireless Devices and Health. Ronald M Powell, PHD.
[<https://www.scribd.com/document/350333234/Annotated-References-on-Wireless-Devices-and-Health>]
- **Exhibit E-15:** "Public Health Implications of Wireless Technologies" Pathophysiology Journal, January 2009, Cindy Sage, David Carpenter, MD. [[http://www.pathophysiologyjournal.com/article/S0928-4680\(09\)00017-0/fulltext](http://www.pathophysiologyjournal.com/article/S0928-4680(09)00017-0/fulltext)]
- **Exhibit E-16:** Smart Meters: Correcting the Gross Misinformation. Institute for Health and the Environment, University at Albany, Director, David Carpenter, MD.
[<https://ecfsapi.fcc.gov/file/7022118538.pdf>]
- **Exhibit E-17:** Expert Reports Refuting the CCST Report, "Health Impacts of Radiofrequency from Smart Meters". 13 Experts.
[https://sagereports.com/smart-meter-rf/?page_id=282]

- **Exhibit E-18:** Report of Partial Findings from the National Toxicology Program (NTP) Carcinogenesis Studies of Cell Phone Radiofrequency Radiation in Hsd: Sprague Dawley® SD rats (Whole Body Exposures)". National Institutes of Health (NIH).
[<https://www.biorxiv.org/content/biorxiv/early/2016/06/23/055699.full.pdf>]
- **Exhibit E-19:** American (ACS) Responds to New Study Linking Cell Phone Radiation to Cancer. Otis Brawley, MD, ACS Chief Medical Officer. [<https://acspressroom.wordpress.com/page/4/>]
- **Exhibit E-20:** Spin vs Fact: National Toxicology Program Report on Cancer Risk from RF radiation. Joel M Moskowitz, PHD, Director for Family and Community Health, School of Public Health, Univ of Calif. [<http://www.cqlpe.ca/pdf/SPINvsFACTS-Factsheet.pdf>]
- **Exhibit E-21:** Major Cell Phone Radiation Study Reignites Cancer Questions. Dina Fine Maron, Scientific American.
[<https://www.scientificamerican.com/article/major-cell-phone-radiation-study-reignites-cancer-questions/>]
- **Exhibit E-22:** Exposure to (Cell Phone) RF Radition Linked to Tumors. Official statements by Christopher Portier, retired Head of the NTP, and David Carpenter, MD.
[<https://mauihawaiitheworld.wordpress.com/2016/05/27/exposure-to-cell-phone-rf-radiation-linked-to-tumors/>]
- **Exhibit E-23:** Oxidative Mechanisms of Biological Activity of Low-Intensity Radiofrequency (RF) Radiation. Electromagnetic Biology and Medicine. Yakymenko, Tsybulin, Sidorik, Henshel, Kyrylenko, Kyrylenko. [<https://ecfsapi.fcc.gov/file/60001122232.pdf>]
- **Exhibit E-24:** What Do Experts Who Signed the International EMF Scientist Appeal Say About Electromagnetic Fields? 21 Experts.
[<http://www.saferemr.com/2017/10/quotes-from-21-experts-regarding.html>]
- **Exhibit E-25:** Direct Testimony of Dr Sam Milham, MD, MPH on Behalf of Warren Woodward and in Opposition to the Settlement Agreement. Harmful Effects of "Dirty Electricity", Samuel Milham, MD, MPH, Before the Arizona Corporation Commission, Docket # E-01345A-16-0036.
[<http://docket.images.azcc.gov/0000178631.pdf>]
- **Exhibit E-26:** Expert Report - Andrew A Marino. Harmful Effect of Smart Meter radiation exposure. Andrew A Marino. MD, JD. August 8, 2016, Before the Pennsylvania Public Utility Commission, Docket No. C-2015-2475726, Laura Sunstein Murphy vs PECO Energy Company.
[http://andrewamarino.com/PDFs/testimony-AAM_Report.pdf]

- **Exhibit E-27:** Smart Meter - What We Know, Measurement Challenges and Complexities. Peter Sierck, Environmental Testing and Technology (ET&T).
[<https://ecfsapi.fcc.gov/file/7022311412.pdf>]
- **Exhibit E-28:** Assessment of Radiofrequency Microwave Radiation Emissions from Smart Meters. Sage Associates.
- **Exhibit E-29:** Assessment of Radiofrequency Microwave Radiation Emissions from Smart Meters - Tables. Sage Associates.
- **Exhibit E-30:** FCC Grant of Equipment Authorization for the SK9AMI7 900 MHz LAN. [<https://fccid.io/SK9AMI7>]
FCC Grant of Equipment Authorization for the 802.15.4 2.4 GHz ZigBee Module. [<https://fccid.io/TYOJN5121M6>]

As new information becomes available, Complainants reserve the right to modify and/or add to these intended Exhibits as appropriate, and as the schedule allows.

5. To the extent not articulated in Your response to the preceding requests, state all facts that support Your claim that Duquesne Light's installation of a Smart Meter at the Property will pose a reliability, safety, or quality problem with your utility service, as alleged in paragraph 4 of Your Complaint.

ANSWER:

As in 1., our facts for this claim have already been presented, with Exhibits and Supporting Documents, in our prior filings. They include, but are not limited to:

- Complainant's Formal Complaint, filed and dated October 1, 2016
- Complainant's Response to Respondent's Preliminary Objections to Formal Complaint, filed and dated November 29, 2016
- Complainant's Response Addendum to Respondent's Corrected Preliminary Objections to Formal Complaint, filed and dated December 19, 2016
- Complainant's Response to Respondent's Answer and New Matter to Formal Complaint, filed and dated January 9, 2017
- Complainant's Response to Respondent's Answer in Opposition to Complainant's Motion for Summary Judgment, file and dated January 20, 2017
- Complainant's Correction to Pulse Transmission Table in Complainant's Response to Respondent's Answer and New Matter to Formal Complaint, filed and dated January 24, 2017
- Complainant's New Matter, filed and dated January 24, 2017
- Complainant's New Matter #2, filed and dated January 27, 2017
- Complainant's New Matter #3, filed and dated February 3, 2017
- Complainant's New Matter #4, filed and dated February 14, 2017

These are all incorporated here-in by reference as if fully restated.

To re-iterate, the facts include but are not limited to:

- the SK9AMI7 Smart Meter:
 - is composed of complex, immature, and unreliable technology, which has led to malfunctions, overbillings, and recalls.
 - is composed of flammable materials, electronic components, and circuit boards, which are subject to overheating, and which have led to increased risk to the homeowner, smoking, popping, fires, property damage, and personal injury.
 - is composed of fragile electrical components and immature technology, which degrade(s) relatively quickly over time due to environmental and other factors, and becomes quickly obsolete, requiring frequent replacement of the Smart Meter, which is expensive.
 - does not provide the homeowner of any warning of overheating, fire danger, or explosion.

- does not possess Underwriters Laboratories (UL) certification, which is the preferred safety certification in the US.
 - does not provide Circuit Breaker protection for the homeowner.
 - does not provide Surge Arrestors designed to withstand and protect the homeowner's internal electrical system, connected appliances, and property from the consequences of large voltage surges and other events originating on the utility-side electrical grid.
 - is susceptible to damage from "hot sockets".
 - uses a Switch-Mode Power Supply (AC/DC switching circuitry) to draw power from the homeowner's electrical line.
This introduces voltage spiking, harmonics, and additional loads and stresses in and on the homeowner's interior electrical wiring,
 - in its wireless mesh grid network, is not private and not secure.
It can be surreptitiously monitored, hacked, and reprogrammed.
 - is significantly more unreliable and unsafe than the standard simple, inexpensive, mature, robust, accurate, safe, reliable, secure, and private non-emitting Analog Meter.
- the Respondent (Duquesne Light) assumes no risk or responsibility for any and all property damage and degradation done to the customer's/homeowner's electrical wiring, electrical appliance, utility meter box, building structure, etc., or personal harm, etc., due to the emissions from its Smart Meter, voltage surges or other events originating on the utility-side electrical grid, or .
- thousands of fires have been documented in PA, CA, TX, FL, NV, IL, and across Canada in buildings after the installation of Smart Meters, including the SK9AMI7. Property has been damaged, and there have been injuries and fatalities. Causes have been attributed to power/voltage surges, overheating, and old building wiring (which is not inspected or assessed prior to installation).
- also, the SK9AMI7 Smart Meter, and its Mesh Network,:
- is hackable and not secure.
It is an unnecessary and unjustified portal into our residence and our lives. It is a reckless program that represents a credible threat of harm and a significant risk to our lives and well-being that we have no control over.
 - violates our constitutionally protected right to privacy.
It is an unnecessary and unjustified portal into our residence and our lives. It is an intrusion on our privacy and, as such, it violates our constitutionally protected rights and liberties.

6. To the extent they have not been previously requested or produced, produce all Documents that relate to Your response to the preceding request.

ANSWER:

In Addition to the above, and the Documents that have already submitted, we submit the following Additional and Expanded Relevant Documents:

- **Exhibit F-1:** Evaluation of the ITRON Open Way AMI Meter. William Bathgate, EE, ME
[<https://www.facebook.com/SmartElectricMeters/photos/a.1792502461071648.1073741830.1783917041930190/1792502634404964/?type=3&theater>]
- **Exhibit F-2:** UL - The Standard in Safety.
[https://www.urbansolarcorp.com/wp-content/uploads/2017/09/UL_The-Standard-in-Safety.pdf]
- **Exhibit F-3:** Wireless Smart Meters and Potential for Electrical Fires. Cindy Sage, Sage Associates, James Biergiel, EMF Electrical Consultant.
[<http://emfsafetynetwork.org/wp-content/uploads/2011/06/Smart-Meters-Risk-for-fire.pdf>]
- **Exhibit F-4:** Analog Meters Withstand "Hot Sockets" Better Than Smart Meters. Report, Smart Grid Awareness.
[<https://smartgridawareness.org/2014/10/16/analog-meters-withstand-hot-sockets-better-than-smart-meters/>]
- **Exhibit F-5:** Stockton Smart Meters Explode After Truck Causes Power Surge. News Report, CBS Sacramento.
[<http://sacramento.cbslocal.com/2015/03/30/stockton-smart-meters-explode-after-truck-causes-power-surge/>]
- **Exhibit F-6:** Exploding Smart Meter Heats up Queen's Park. News Report, Toronto Sun.
[<http://torontosun.com/2015/06/04/exploding-smart-meter-heats-up-queens-park/wcm/abe694cb-b7b0-45dc-ba0c-8b42d7a9c7b8>]
- **Exhibit F-7:** Wireless Utility Meter Safety Impacts Survey. E Halteman, PHD.
[<http://emfsafetynetwork.org/wp-content/uploads/2011/09/Wireless-Utility-Meter-Safety-Impacts-Survey-Results-Final.pdf>]
- **Exhibit F-8:** 'Smart' Meter Fire Situation Continues to Escalate (KSHB-TV, Kansas City). News Report. KSHB-TV.
[https://www.youtube.com/watch?v=yV_cHlxKoIE]
- **Exhibit F-9:** Jefferson County Power Outage Causes Thousands of Dollars in Damages. News Report. WJACTV [<http://wjactv.com/news/local/jefferson-county-power-outage-causes-thousands-of-dollars-in-damages>]
Tiny Town's Power Surge Fries Computers, Appliances, Siding. News Report. Associated Press. [<http://www.star-telegram.com/news/nation-world/national/article129121549.html>]
Served by FirstEnergy SK9AMI7 Smart Meters.
[<https://www.firstenergycorp.com/content/dam/customer/gethelp/files/PASmartMeter/speakers-bureau-smart-meters-PA-03-06-2017.pdf>]

- **Exhibit F-10:** Cybersecurity - Challenges in Securing the Modernized Electricity Grid. US Government Accountability Office (GAO). Testimony Before the Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representatives. GAO-12-507T. [<http://www.gao.gov/assets/600/592508.pdf>]
- **Exhibit F-11:** FBI: Smart Meter Hacks Likely to Spread. FBI Intelligence Bulletin. [<http://krebsonsecurity.com/2012/04/fbi-smart-meter-hacks-likely-to-spread/>]
- **Exhibit F-12:** The 10 Biggest Data Breaches Of 2016 (So Far). IT Trade News Report [<http://www.crn.com/slide-shows/security/300081491/the-10-biggest-data-breaches-of-2016-so-far.htm>]
- **Exhibit F-13:** Here Are All The Ways The Equifax Data Breach is Worse Than You Can Imagine. News Report. LA Times. [<http://www.latimes.com/business/hiltzik/la-fi-hiltzik-equifax-breach-20170908-story.html>]
- **Exhibit F-14:** KRACK Spells Big Trouble for Wireless Security. Industry News Report. Redmond Channel Partner (RCP) Online Magazine. [<https://rcpmag.com/Blogs/Scott-Bekker/2017/10/Security-KRACK-WPA2.aspx?p=1>]
- **Exhibit F-15:** Global Data Firm: "We Help Utilities Surveil and Profile Their Customers, and Monetize Home Surveillance Data". News Report. Josh del Sol.
- **Exhibit F-16:** ONZO Announces Major Enhancements to Customer Insights Data Analytics Solution. [<http://www.prnewswire.com/news-releases/onzo-announces-major-enhancements-to-customer-insights-data-analytics-solution-568136871.html>]

As new information becomes available, Complainants reserve the right to modify and/or add to these intended Exhibits as appropriate, and as the schedule allows.

7. State all facts that support Your claim that Duquesne Light's manner of installing smart meters is unsafe, as alleged throughout Your Formal Complaint.

ANSWER:

As in 1., our facts for this claim have already been presented, with Exhibits and Supporting Documents, in our prior filings. They include, but are not limited to:

- Complainant's Formal Complaint, filed and dated October 1, 2016
- Complainant's Response to Respondent's Preliminary Objections to Formal Complaint, filed and dated November 29, 2016
- Complainant's Response Addendum to Respondent's Corrected Preliminary Objections to Formal Complaint, filed and dated December 19, 2016
- Complainant's Response to Respondent's Answer and New Matter to Formal Complaint, filed and dated January 9, 2017
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- Complainant's Correction to Pulse Transmission Table in Complainant's Response to Respondent's Answer and New Matter to Formal Complaint, filed and dated January 24, 2017
- Complainant's New Matter, filed and dated January 24, 2017
- Complainant's New Matter #2, filed and dated January 27, 2017
- Complainant's New Matter #3, filed and dated February 3, 2017
- Complainant's New Matter #4, filed and dated February 14, 2017

These are all incorporated here-in by reference as if fully restated.

To re-iterate, the facts include but are not limited to:

- Smart Meter installations are not being carried out by certified Duquesne Light electricians.
Instead, Smart Meter installation is being subcontracted out to contractors who employ installer technicians with varying degrees of training and expertise, such as Wellington Power Corporation.
- The Smart Meter installations have been witnessed and observed by many, including myself. The meters are just simply and quickly swapped out in what is called a "hot install". The focus is on speed of deployment not safety for the homeowner.
- The homeowner's neutral connections are not considered or checked by a certified electrician for damage or corrosion prior to installation.
- The age and condition of the homeowner's electrical system, wiring, and meter box bases are not considered or checked by a certified electrician prior to installation to ensure that the the sockets and house wiring are compatible with the installation of a Smart Meter.
- Testing for "hot sockets" is not performed during the installation.
- The electric power to the residence is not turned off during the installation to protect the homeowner's electrical system and appliances from damage due to the "hot install" installation process.

- The Respondent (Duquesne Light) assumes no risk or responsibility for any and all property damage, or personal harm, etc. resulting from the manner in which their Smart Meter is installed.

8. Produce all Documents that relate to Your response to the preceding request.

ANSWER:

In Addition to the above, and the Documents that have already submitted, we submit the following Additional and Expanded Relevant Documents:

- Testimony that Duquesne Light Company gave before the PUC on August 14, 2009, concerning Duquesne Light's Smart Meter Procurement and Installation Plan, Docket No. M-2009-2123948 Exhibit C. This is a 110 page document that is already in Duquesne Light's possession. It is readily available online at [<http://www.puc.pa.gov/pdocs/1050874.pdf>]

As new information becomes available, Complainants reserve the right to modify and/or add to these intended Exhibits as appropriate, and as the schedule allows.

9. To the extent not previously requested or produced, produce all Documents that You intend to offer into evidence at any hearing in this matter.

ANSWER:

- a. Supporting Documents, References, and Exhibits
already Officially Submitted with Our Filings, with verified links to sources:

I. COMPLAINANT'S PA PUC FORMAL COMPLAINT - (October 3, 2016)

Supporting documents supplied with this complaint:

01. 09/27/2016 - NOTICE OF NON-CONSENT TO TRESPASSING AND SURVEILLANCE, NOTICE OF LIABILITY Concerning Your Intent to Install a "Smart Digital Meter", which was mailed and emailed to Duquesne Light Customer Care to the attention of Campbell Hawkins, Vice President of Customer Care.
02. 09/29/2016 - Duquesne Light Customer Care. - ATTENTION: Campbell Hawkins VP of Customer Care, which was emailed.
03. 09/30/2016 - Duquesne Light Customer Care. - ATTENTION: Campbell Hawkins VP of Customer Care, which was emailed.
04. 09/27/2016 -10/01/2016 - My communications with various government agencies, from my city Mayor to Governor Wolf, can be supplied upon request.
05. **"Ranking Electricity Meters for Risk to Health, Privacy, and Cyber Security"**, by Ronald Powell, Ph'd.
[<https://www.scribd.com/document/289782183/Ranking-Electricity-Meters-for-Risk-to-Health-Privacy-and-Cyber-Security>]
06. **"A Message to the Maryland General Assembly - The Health Argument for Replacing Wireless Smart Meters with a Safe Metering Technology in Maryland"**, by Ronald Powell, Ph'd.
[<https://www.scribd.com/document/289787721/The-Health-Argument-for-Replacing-Wireless-Smart-Meters-with-a-Safe-Metering-Technology-in-Maryland>]
07. **How Dangerous and Expensive Became "Smart" An Exposé of the "Smart Grid"**, by Amy Worthington, of westonaprice.org, which carried out a detailed investigative report of the issue, and concluded with the recommendation to resist attempts at installation of these hazardous devices.
[<https://www.westonaprice.org/health-topics/environmental-toxins/smart-meters-not-so-smart/>]

References:

The amount of information detailing the numerous problems associated with Smart Meters is currently so vast that it would be impossible to list it all here. But, a few additional supporting references are listed below:

01. **Public Health Physician Warns of Smart Meter Dangers, Stresses Need for Analog Option**
[http://www.youtube.com/watch?v=n7L21XOC2wA&feature=player_embedded]
02. **Smart Meters Emit Constant Microwave Radiation: WUSA9 News**
[<https://www.youtube.com/watch?v=eGdAefQ8nbq>]
03. Sacramento Environmental Consultant Eric Windheim in this months' Health & Fitness Magazine, "**Living Inside an Electric Cage Without Knowing it**" by Dr. Doma [https://issuu.com/healthfitness.us/docs/h_fm_julyaugust_2016?e]
04. **Wireless Smart Meters and Potential for Electrical Fires**
[<http://eon3emfblog.net/wp-content/uploads/2010/09/Wireless-Smart-Meters-and-Potential-for-Electrical-Fires.pdf>]
05. **Smart Meters Increase the Risk of Fires!**
[<https://smartgridawareness.org/2014/08/03/smart-meters-increase-the-risk-of-fires/Smart>]
06. **Consumers Digest Investigative Report - "Why Smart Meters Might Be a Dumb Idea", by By William J. Kelly**
[<http://www.consumersdigest.com/special-reports/why-smart-meters-might-be-a-dumb-idea>]
07. **SMART METERS: No Federal Mandate**
[<http://ppjg.wordpress.com/2011/08/15/smart-meters-no-federal-mandate/>]
08. **Ontario Pulls Plug on 36,000 Rural 'Smart' Meters, January 20, 2016**
by Josh del Sol
[<http://www.collective-evolution.com/2016/01/20/ontario-pulls-plug-on-36000-rural-smart-meters-is-big-energy-imploding/>]

II. COMPLAINANT'S RESPONSE to RESPONDENT'S PRELIMINARY OBJECTIONS TO FORMAL COMPLAINT - (November 29, 2016)

Exhibits:

Exhibit 1 of 4: (2 pages) **David Carpenter M.D.**, Public Health Physician and Former Dean of the School of Public Health at the University at Albany, on the faulty report by the California Council on Science and Technology entitled, "Health Impacts of Radiofrequency from Smart Meters." Dr. Carpenter asserts and has testified that "there is conclusive evidence for adverse health effects in humans."
[http://sagereports.com/smart-meter-rf/docs/letters/Carpenter_final_CCST.pdf]

Exhibit 2 of 4: (11 pages) **Daniel Hirsch**, University of California, SC, Lecturer, Director of Program on Environmental and Nuclear Policy, on the same faulty report by the California Council on Science and Technology, which was based on estimates

from the Electric Power Research Institute (EPRI), an industry group. His analysis shows that the whole body exposure from a Smart Meter is actually orders of magnitude higher than that of a cellphone, rather than orders of magnitude lower as is routinely claimed.

[http://www.committeetobridgethegap.org/pdf/110212_RFrad_comments.pdf]

Exhibit 3 of 4: (14 pages) **Karl Maret, M.D.**, BS in EE, MS in BE, President of Dove Health Alliance, a non-profit foundation specializing in the area of Energy Medicine, also asserts that this same CCST report used by many as evidence to validate the safety of Smart Meters contains inaccuracies and minimizes the biological effects and health impacts of non-thermal radiofrequency radiation, such as those produced by wireless technologies including Smart Meters.

[http://sagereports.com/smart-meter-rf/docs/letters/Maret - CCST Commentary 1-31-2011_final.pdf]

Exhibit 4 of 4: (3 pages) **"American Academy of Environmental Medicine Recommendations Regarding Electromagnetic and Radiofrequency Exposure"**

[<https://www.aaemonline.org/pdf/AAEMEMFmedicalconditions.pdf>]

III. COMPLAINANT'S RESPONSE ADDENDUM to RESPONDENT'S CORRECTED PRELIMINARY OBJECTIONS TO FORMAL COMPLAINT - (December 19, 2016)

References: (Public PA PUC Public Court Records)

Norbert Sliwinski v Duquesne Light Company, C-2016-2559985,

[http://www.puc.state.pa.us/about_puc/consolidated_case_view.aspx?Docket=C-2016-2559985]

Thomas and Margery McCarey vs PECO Energy Company,

Docket No. C-2013-2354862

[http://www.puc.state.pa.us/about_puc/consolidated_case_view.aspx?Docket=C-2013-2354862]

Laura Sunstein Murphy v PECO Energy Company, Docket No. C-2015-2475726.

[http://www.puc.state.pa.us/about_puc/consolidated_case_view.aspx?Docket=C-2015-2475726]

Susan Kreider v. PECO Energy Company, Docket No. C-2015-2469655

[http://www.puc.state.pa.us/about_puc/consolidated_case_view.aspx?Docket=C-2015-2469655]

IV. COMPLAINANT'S RESPONSE to RESPONDENT'S ANSWER AND NEW MATTER TO FORMAL COMPLAINT - (January 9, 2017)

Exhibits:

Exhibit 1 of 7: (2 pages) July 28, 2016 CRN industry report, **"The 10 Biggest Data Breaches Of 2016 (So Far)"**.

[<http://www.crn.com/slide-shows/security/300081491/the-10-biggest-data-breaches-of-2016-so-far.htm>]

Exhibit 2 of 7: (5 pages) Testimony that Duquesne Light Company gave before the PUC on August 14, 2009, concerning **Duquesne Light's Smart Meter Procurement and Installation Plan**, Docket No. M-2009-2123948 Exhibit C.

[<http://www.puc.pa.gov/pcdocs/1050874.pdf>]

Exhibit 3 of 7: (4 pages) Testimony given before the British Columbia Utilities Commission in the Matter of the Utilities Commission Act R.S.B.C. 1996, Chapter 473 And Re: **FortisBC Energy Inc.** Application for a Certificate of Public Convenience and Necessity for the Advanced Metering Infrastructure Project; Kelowna, B.C.; March 11, 2013, **regarding the SK9AMI7 Smart Meter** in the same type of grid that Duquesne Light is currently deploying in the Pittsburgh area. Pages 1318, 1328, 1334.

[http://www.bcuc.com/Documents/Transcripts/2013/DOC_33930_03-11-2013_Oral-Hearing-Transcript-Volume7.pdf]

Exhibit 4 of 7: (4 pages) Itron White Paper - "**Wireless Transmissions: An examination of OpenWay Smart Meter Transmissions in a 24-Hour Duty Cycle**" for the Itron SK9AMI7 OpenWay Centron Smart Meter provides Duty Cycle, Time, and Transmission Burst data.

[<https://www.itron.com/na/-/media/itron/resource-center/openway-wireless-transmissions24-hour-duty-cycle.pdf?la=en-US>]

Exhibit 5 of 7: (2 pages) **FortisBC Inc.** also submitted Exhibit C4-4 FortisBC Inc. Advanced Metering Infrastructure CPCN on October 26, 2012. para. 55.0, Reference: Exhibit B-1, Appendix C-5, Status of Research on Radiofrequency Exposure and Health in Relation to Advanced Metering Infrastructure, (Sub-) Appendix A, Technical Memorandum, Advanced Metering Infrastructure Exposure Assessment, p.A-2 (pdf p.564 of 747) **regarding the Itron AMI7 meter (FCC ID SK9AMI7).**

[http://www.bcuc.com/Documents/Proceedings/2012/DOC_32248_C4-4_BCSEA-IR-No-1.pdf]

Exhibit 6 of 7: (6 pages) World Health Organization (WHO), October 20, 2011, the International Agency for Research into Cancer (IARC), new assessment "**Radio Frequency Electromagnetic Fields**" (the sort given off by mobile phones and Smart Meters) belong to the "**Group 2B**" class of agents, such as lead, engine exhaust, and chloroform, and as such, represent a potential "carcinogenic hazard".

[http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf]

Exhibit 7 of 7: (14 pages) Expert testimony received by the PA PUC from Dr. Andrew A Marino. "**Expert Report of Andrew A Marino**" dated August 8, 2016.

[<https://ehtrust.org/wp-content/uploads/testimony-Andrew-Marino.pdf>]

References:

01. "**Why the Latest Yahoo Hack Is So Much Worse Than You Think**"

"It's a nightmare for the company and for a billion of its users".

[<http://time.com/4604273/yahoo-hack-verizon/>]

02. **Former Director of the CIA, James Woolsey**, statements on the public record concerning the vulnerabilities of the Smart Meters and Smart Grid,

[<https://www.youtube.com/watch?v=rIFD1sUTGX8>]

03. **Written submittal filed with the Massachusetts PUC, Northeast Utilities**, stating there is no rational basis for ... mandated implementation of [smart meters]; there is no cost justification that can support the implementation of

[smart meters]; mandating [smart meters] creates an intractable obstacle to grid modernization; the cost remains unjustified by the benefits; etc.
[<https://skyvisionsolutions.files.wordpress.com/2014/02/northeast-utilities-ma-dpu-12-76-submittal.pdf>]

04. **Court Order by California PUC ALJ Judge Amy C. Yip-Kikugawa** to compel PG&E (a CA EDC) and ITRON (the Smart Meter manufacturer of the SK9AMI7 OpenWay Centron Smart Meter being deployed by Duquesne Light here in Western Pennsylvania) to provide the true data.
[<http://docs.cpuc.ca.gov/efile/RULINGS/145652.pdf>]
05. **Authorities Having Jurisdiction (AHJs)** assert that certification of electrical equipment is necessary and that Underwriters Laboratories is the preferred safety certification organization.
[https://www.urbansolarcorp.com/wp-content/uploads/2017/09/UL_The-Standard-in-Safety.pdf]
06. **Legislative Record, in Senate Journal** Pages 2626-2631, Oct. 8, 2008
[<http://www.legis.state.pa.us/WU01/LI/SJ/2008/0/Sj20081008.pdf#page=8>]
07. 66 Pa. C.S. § 2807(f) (2) of the Public Utility Code
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/66/66.HTM>]
08. Section 1501 of the Public Utility Code
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/PDF/66/66.PDF>]
09. 52 Pa. Code § 5.231.
[<https://www.pacode.com/secure/data/052/chapter5/chap5toc.html>]

V. COMPLAINANT'S RESPONSE to ANSWER IN OPPOSITION TO COMPLAINANT'S MOTION FOR SUMMARY JUDGMENT - (January 20, 2017)

Exhibits:

Exhibit 1 of 1: (17 pages) Testimony and Exhibits before the PA PUC in November of 2016 from Smart Meter Complainant **Catherine Frompovich**, in Catherine J Frompovich v PECO Energy Company, Docket No. C-2015-2474602
[<http://stopsmartmeterspa.blogspot.com/2016/11/smart-meter-case-testimony-before.html>]

References:

01. U.S. Bill of Rights
[<https://www.usconstitution.net/const.pdf>]
02. Pennsylvania Constitution Section 1
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/00/00.HTM>]
03. PA Section §1501 of the Public Utility Code
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/PDF/66/66.PDF>]

04. Act 129, C.S. § 2807(f) (2) as passed by the Legislature.
[<http://www.legis.state.pa.us/WU01/LI/LI/US/HTM/2008/0/0129..HTM>]

05. 52 Pa. Code § 5.102
[<https://www.pacode.com/secure/data/052/chapter5/s5.102.html>]

VI. COMPLAINANT'S CORRECTION to PULSE TRANSMISSION TABLE in
COMPLAINANT'S RESPONDENT'S ANSWER AND NEW MATTER TO FORMAL
COMPLAINT - (January 24, 2017)

VII. COMPLAINANT'S NOTICE TO PLEAD on NEW MATTER [#1] - (January 24, 2017)

Exhibits:

Exhibit 1 of 5: (2 pages) **Court Order by California PUC ALJ Judge Amy C. Yip-Kikugawa** to compel PG&E (a CA EDC) and ITRON (the Smart Meter manufacturer of the SK9AMI7 OpenWay Centron Smart Meter being deployed by Duquesne Light here in Western Pennsylvania) to provide the true data.
[<http://docs.cpuc.ca.gov/efile/RULINGS/145652.pdf>]

Exhibit 2 of 5: (3 pages) BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA - **PACIFIC GAS AND ELECTRIC COMPANY'S RESPONSE TO ADMINISTRATIVE LAW JUDGE'S OCTOBER 18, 2011 RULING DIRECTING IT TO FILE CLARIFYING RADIO FREQUENCY INFORMATION.**
[<http://docs.cpuc.ca.gov/efile/RESP/149398.pdf>]

Exhibit 3 of 5: (4 pages) Itron White Paper - **"Wireless Transmissions: An examination of OpenWay Smart Meter Transmissions in a 24-Hour Duty Cycle"** for the Itron SK9AMI7 OpenWay Centron Smart Meter provides Duty Cycle, Time, and Transmission Burst data.
[<https://www.itron.com/na/-/media/itron/resource-center/openway-wireless-transmissions24-hour-duty-cycle.pdf?la=en-US>]

Exhibit 4 of 5: (3 pages) Testimony given before the British Columbia Utilities Commission in the Matter of the Utilities Commission Act R.S.B.C. 1996, Chapter 473 And Re: **FortisBC** Energy Inc. Application for a Certificate of Public Convenience and Necessity for the Advanced Metering Infrastructure Project; Kelowna, B.C.; March 11, 2013. FortisBC Inc. CPCN for AMI Volume 7, March 11, 2013 Page: 1318.
[http://www.bcuc.com/Documents/Transcripts/2013/DOC_33930_03-11-2013_Oral-Hearing-Transcript-Volume7.pdf]

Exhibit 5 of 5: (2 pages) **FortisBC** Inc. also submitted Exhibit C4-4 FortisBC Inc. Advanced Metering Infrastructure CPCN on October 26, 2012, para. 55.0, Reference: Exhibit B-1, Appendix C-5, Status of Research on Radiofrequency Exposure and Health in Relation to Advanced Metering Infrastructure, (Sub-) Appendix A, Technical Memorandum, Advanced Metering Infrastructure Exposure Assessment, p.A-2 (pdf p.564 of 747) **regarding the Itron AMI7 meter (FCC ID SK9AMI7).**
[http://www.bcuc.com/Documents/Proceedings/2012/DOC_32248_C4-4_BCSEA-IR-No-1.pdf]

References:

01. § 1501 of the Public Utility Code
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/PDF/66/66.PDF>]

VIII. COMPLAINANT'S NOTICE TO PLEAD on NEW MATTER #2 - (January 27, 2017)

References:

01. Act 129, C.S. § 2807(f) (2) as passed by the Legislature.
[<http://www.legis.state.pa.us/WU01/LI/LI/US/HTM/2008/0/0129..HTM>]
02. Trans-Lex.org Law Search - Principle No. 1.2.1 - Standard of reasonableness
[https://www.trans-lex.org/902000/_/standard-of-reasonableness/]
03. Legislative Record, in Senate Journal Pages 2626-2631, Oct. 8, 2008
[<http://www.legis.state.pa.us/WU01/LI/SJ/2008/0/Sj20081008.pdf#page=8>]
04. Supreme Court ruling (Gutierrez de Martinez v. Lamagno 515 U.S. 417 (1995))
[<https://www.law.cornell.edu/supct/html/94-167.ZO.html>]
05. Bryan Garner, the legal writing scholar and editor of Black's Law Dictionary's, legal opinion.
[http://www.abajournal.com/magazine/article/shall_we_abandon_shall]
06. The Federal Register Document Drafting Handbook (Section 3) regulation.
[<https://www.archives.gov/federal-register/write/legal-docs/clear-writing.html>]
07. The Federal Plain Language Guidelines (page 25) referred to in the Federal Plain Writing Act of 2010.
[<http://www.plainlanguage.gov/howto/guidelines/bigdoc/fullbigdoc.pdf>]
08. Accepted legal standards - Federal Rules of Civil Procedure.
[https://www.faa.gov/about/initiatives/plain_language/articles/mandatory/]
09. PA PUC Smart Meter Implementation Order
[<http://www.puc.pa.gov/pcdocs/1046123.doc>]

IX. COMPLAINANT'S NOTICE TO PLEAD on NEW MATTER #3 - (February 3, 2017)

Exhibits:

Exhibit 1 of 5: (2 pages) **FCC Grants of Equipment Authorization for the SK9AMI7 Smart Meter and the 802.15.4 ZigBee Module.**

[<https://fccid.io/SK9AMI7>], [<https://fccid.io/TYOJN5121M6>]

Exhibit 2 of 5: (7 pages) **May 2016 report, National Toxicology Program (NTP), a federal interagency group under the National Institutes of Health (NIH). Findings from a \$25 million animal study of the cancer risk from Radiofrequency (RF) radiation.**

[<https://www.biorxiv.org/content/biorxiv/early/2016/06/23/055699.full.pdf>]

Exhibit 3 of 5: (1 page) **Electromagnetic Biology and Medicine journal, Volume 35, 2016 - Issue 2, "Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation."**

[<https://ecfsapi.fcc.gov/file/60001122232.pdf>]

Exhibit 4 of 5: (2 pages) January 20, 2017, power outage occurred in Brookville Borough in Jefferson County, reported in the Associated Press.
 [<http://wjactv.com/news/local/jefferson-county-power-outage-causes-thousands-of-dollars-in-damages>]
 [<http://www.thereporter.com/business/20170127/tiny-towns-power-surge-fries-computers-appliances-siding>]

Exhibit 5 of 5: (1 page) FirstEnergy Centron/Itron SK9AMI7 Digital Smart Meter deployment.
 [<https://www.firstenergycorp.com/content/dam/customer/get-help/files/PASmartMeter/speakers-bureau-smart-meters-PA-03-06-2017.pdf>]

References:

01. Federal Communications Commission (FCC) mandate.
 [<https://www.fcc.gov/about-fcc/what-we-do>]

02. Current existing or recommended international exposure limits:

Regulatory:	Italy, Poland, Hungary Bulgaria, China, Russia	10 $\mu\text{W}/\text{cm}^2$
Regulatory :	Switzerland	4.5 $\mu\text{W}/\text{cm}^2$
Recommendation:	Ecolog Institute	0.3 $\mu\text{W}/\text{cm}^2$
Recommendation:	Salzburg Resolution	0.1 $\mu\text{W}/\text{cm}^2$
Recommendation:	BioInitiative Report (2008)	< 0.1 $\mu\text{W}/\text{cm}^2$ outdoor < 0.01 $\mu\text{W}/\text{cm}^2$ indoor
Recommendation:	STOA, EU Parliament	0.01 $\mu\text{W}/\text{cm}^2$

[https://hbelc.org/pdf/Resources/SmartMeter_Sierck.pdf]

03. August 2009, Volume 16 issue of the International Pathophysiology Journal, **"Public Health Implications of Wireless Technologies"**.
 [[http://www.pathophysiologyjournal.com/article/S0928-4680\(09\)00017-0/fulltext](http://www.pathophysiologyjournal.com/article/S0928-4680(09)00017-0/fulltext)]

04. Damage to the fetal brain. [<https://www.ncbi.nlm.nih.gov/pubmed/22268709>]

05. Leaky cells. [<http://onlinelibrary.wiley.com/doi/10.1002/bem.2250100208/abstract>]

06. Adverse affect on heart rhythm.
 [<http://www.magdahavas.com/microwave-radiation-affects-the-heart-are-the-results-real-or-are-they-due-to-interference/>]

07. Damaged sperm.
 [http://www.huffingtonpost.com/2011/11/29/laptop-wifi-sperm-damage-electromagnetic-radiation_n_1118726.html]

08. Broken DNA. [<http://www.cnn.com/videos/>]

09. Damaged DNA.
[http://www.buergerwelle.de/assets/files/dna_damage_in_molt_4_t_cells.pdf]
10. Increased glucose in the brain.
[<http://jamanetwork.com/journals/jama/fullarticle/645813>]
11. Reduced immunity. [<https://www.ncbi.nlm.nih.gov/pubmed/10619445>]
12. Dulled memory. [<https://www.ncbi.nlm.nih.gov/pubmed/18044737>]
13. Stressed genes. [<https://www.ncbi.nlm.nih.gov/pubmed/11683499>]
14. Weakened bones.
[<http://www.modernmedicine.com/modern-medicine/news/modernmedicine/modern-medicine-news/cell-phone-proximity-hip-tied-bone-minerali>]
15. **"Duquesne Light Company Final Smart Meter Technology Procurement and Installation Plan"** Docket Nos. P-2012- M-2009-2123948
[<https://www.duquesnelight.com/docs/default-source/default-document-library/final-smart-meter-program-plan.pdf?sfvrsn=2>]
16. **"The BioInitiative 2012 Report"**
[<http://www.bioinitiative.org>]
17. **"Health Effects of RF - Research Review"**
(at the FCC [<https://www.fcc.gov/ecfs/filing/6017465430>])
[<https://ecfsapi.fcc.gov/file/7520940903.pdf>]
18. **"Electromagnetic Sensitivity and Electromagnetic Hypersensitivity: A Summary"**
[<http://www.es-uk.info>]
19. **American Academy of Pediatrics (AAP).**
[<https://www.scribd.com/document/118348085/AAP-Supports-Child-Cell-Phone-Protection>]
20. **American Cancer Society (ACS);** May 27, 2016, Otis W. Brawley, M.D., American Cancer Society Chief Medical Officer statement.
[<https://acspressroom.wordpress.com/2016/05/27/ntpcellphones/>]

X. COMPLAINANT'S NOTICE TO PLEAD on NEW MATTER #4 - (February 3, 2017)

References:

01. Section § 1 of the Constitution of the Commonwealth of Pennsylvania.
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/00/00.HTM>]
02. Section § 2 of the Constitution of the Commonwealth of Pennsylvania.
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/00/00.HTM>]

03. Section § 8 of the Constitution of the Commonwealth of Pennsylvania.
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/00/00.HTM>]
04. Section § 11 of the Constitution of the Commonwealth of Pennsylvania.
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/00/00.HTM>]
05. Section § 26 of the Constitution of the Commonwealth of Pennsylvania.
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/00/00.HTM>]
06. Section § 27 of the Constitution of the Commonwealth of Pennsylvania.
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/00/00.HTM>]
07. Section § 31 of the Constitution of the Commonwealth of Pennsylvania.
[<http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/00/00.HTM>]
08. 4TH AMENDMENT of the U.S. Constitution.
[<https://www.usconstitution.net/const.pdf>]
09. 5th AMENDMENT of the U.S. Constitution.
[<https://www.usconstitution.net/const.pdf>]
10. 10th AMENDMENT of the U.S. Constitution.
[<https://www.usconstitution.net/const.pdf>]
11. 14th AMENDMENT of the U.S. Constitution.
[<https://www.usconstitution.net/const.pdf>]

b. In Addition to the above, and the Documents that have already submitted, we submit the following Additional and Expanded Relevant Documents:

- **Exhibit G-1: Getting Smarter About the Smart Grid.**
[http://gettingsmarteraboutthesmartgrid.org/pdf/SmartGrid_Report_PDF-2012-11-26-Final.pdf]
- **Exhibit G-2: Initial Comments of Northeast Utilities Executive Summary, Commonwealth of Massachusetts Department of Public Utilities, D.P.U. 12-76-A**
[<https://skyvisionsolutions.files.wordpress.com/2014/02/northeast-utilities-ma-dpu-12-76-submittal.pdf>]
- **Exhibit G-3: Public Code (66 PA.C.S.) – Omnibus Amendments, Act of Oct. 15, 2008, P.L. 1592, No. 129.**
[<http://www.legis.state.pa.us/WU01/LI/LI/US/HTM/2008/0/0129.HTM>]
- **Exhibit G-4: Commonwealth of Pennsylvania, Legislative Journal, Monday, February 11, 2008, No. 13, House of Representatives.**
[<http://www.legis.state.pa.us/WU01/LI/HJ/2008/0/20080211.pdf#page=6>]

- **Exhibit G-5:** The General Assembly of Pennsylvania House Bill No. 2200 Session of 2008. No. 3218. No. 3233. No. 4429.
[\[http://www.legis.state.pa.us/cfdocs/legis/PN/Public/btCheck.cfm?txtType=HTM&sessYr=2007&sessInd=0&billBody=H&billTyp=B&billNbr=2200&pn=3218\]](http://www.legis.state.pa.us/cfdocs/legis/PN/Public/btCheck.cfm?txtType=HTM&sessYr=2007&sessInd=0&billBody=H&billTyp=B&billNbr=2200&pn=3218)
[\[http://www.legis.state.pa.us/cfdocs/legis/PN/Public/btCheck.cfm?txtType=HTM&sessYr=2007&sessInd=0&billBody=H&billTyp=B&billNbr=2200&pn=3233\]](http://www.legis.state.pa.us/cfdocs/legis/PN/Public/btCheck.cfm?txtType=HTM&sessYr=2007&sessInd=0&billBody=H&billTyp=B&billNbr=2200&pn=3233)
[\[http://www.legis.state.pa.us/cfdocs/legis/PN/Public/btCheck.cfm?txtType=HTM&sessYr=2007&sessInd=0&billBody=H&billTyp=B&billNbr=2200&pn=4429\]](http://www.legis.state.pa.us/cfdocs/legis/PN/Public/btCheck.cfm?txtType=HTM&sessYr=2007&sessInd=0&billBody=H&billTyp=B&billNbr=2200&pn=4429)
- **Exhibit G-6:** Commonwealth of Pennsylvania, Legislative Journal, Wednesday, October 8, 2008, No. 64. Senate.
[\[http://www.legis.state.pa.us/WU01/LI/SJ/2008/0/Sj20081008.pdf#page=13 \]](http://www.legis.state.pa.us/WU01/LI/SJ/2008/0/Sj20081008.pdf#page=13)
- **Exhibit G-7:** Trans-Lex.org Law Search - Principle No. I.2.1 - Standard of reasonableness
[\[https://www.trans-lex.org/902000/standard-of-reasonableness/ \]](https://www.trans-lex.org/902000/standard-of-reasonableness/)
- **Exhibit G-8:** Supreme Court ruling (Gutierrez de Martinez v. Lamagno 515 U.S. 417 (1995)). [\[https://www.law.cornell.edu/supct/html/94-167.ZO.html \]](https://www.law.cornell.edu/supct/html/94-167.ZO.html)
- **Exhibit G-9:** Accepted legal standards - Federal Rules of Civil Procedure.
[\[https://www.faa.gov/about/initiatives/plain_language/articles/mandatory/ \]](https://www.faa.gov/about/initiatives/plain_language/articles/mandatory/)
- **Exhibit G-10:** Pennsylvania PUC Smart Meter Q&A.
[\[http://www.puc.state.pa.us/General/consumer_ed/pdf/13_Smart%20Meters.pdf \]](http://www.puc.state.pa.us/General/consumer_ed/pdf/13_Smart%20Meters.pdf)

As new information becomes available, Complainants reserve the right to modify and/or add to these intended Exhibits as appropriate, and as the schedule allows.

10. State the full name, address, and telephone number of each person who You expect to call to testify at any hearing of this matter.

ANSWER:

The availability of any person that we might desire to have testify at our Hearing depends on the dates of the Hearing, which we have requested be rescheduled to March 2018, and people's schedules.

As soon as this can be determined with certainty, and a decision can be made, the Respondent will be informed of the planned appearance of any person that we desire to have testify, and their particular details.

11. State the full name, address, and telephone number of each person who You expect to call to testify as an expert witness at any hearing of this matter and, for each expert witness, state:

- a. The subject matter on which the expert is expected to testify;
- b. The substance of the facts and opinions to which the expert is expected to testify; and
- c. A summary of the grounds for each expert opinion.

ANSWER:

a., b., c. I have been in direct contact with a number of experts, particularly:

- David O Carpenter, MD
Director, Institute for Health and the Environment, University at Albany
Area of Expertise - Primarily, Health Effects and Risks

Note: Dr. Carpenter has written a letter to the PA PUC and ALJ Watson on our behalf, which is included in this Discovery response as Exhibit B-6.
- Ronald M Powell, PHD
Applied Physics, Harvard University
Retired, Executive Office of the President, the NSF, and the NIST
Area of Expertise - Primarily, Physics and Biomedical Research
- Andrew A Marino,
PHD., Biophysics, Syracuse University
JD, Law, Syracuse University
Area of Expertise - Primarily, Health Effects and Risks
- Samuel P Milham, MD, MPH
Retired, Section Head, Chronic Disease Epidemiologist
Washington State Department of Health
Area of Expertise - Primarily, Health Effects and Risks

The Hearing dates are unclear at this date. A request has been submitted to the PA PUC to reschedule the Hearing for March 2018. People's schedules need to be considered in light of the Hearing dates, therefore the availability of any expert witness cannot be stated at this time.

As soon as this can be determined with certainty, and a decision can be made, the Respondent will be informed of the planned appearance of any expert witness, and their specific details.

In any event, documents, expert testimony, and reports by these experts have already been and will be submitted as Exhibits.

12. Produce the report of any expert You intend to call to testify on Your behalf at trial.

ANSWER:

A number of reports and documents from these experts have already been submitted with our previous filings. Some additional documents from these experts have been supplied with this response to Respondent's First Discovery Request.

13. Produce the curriculum vitae of any expert that You intend to call to testify on your behalf at trial.

ANSWER:

The availability any one of these experts, or any potential other experts, is not known for a certainty at this time.

In any case, their backgrounds and/or curriculum vitae have been included here, as a proactive measure.

- **Exhibit CV-1: David O Carpenter, MD**

A Background / Curriculum Vitae, proactively, has been provided.

Dr. Carpenter has written a letter to the PA PUC and ALJ Watson on our behalf, which is included in this Discovery response as **Exhibit E-6**.

- **Exhibit CV-2: Ronald M Powell, PHD (retired)**

A Background / Curriculum Vitae, proactively, has been provided.

- **Exhibit CV-3: Andrew A Marino, MD, JD**

A Background / Curriculum Vitae, proactively, has been provided.

- **Exhibit CV-4: Samuel P Milham, MD, MPH (retired)**

Author of the book, "Dirty Electricity: Electrification and the Diseases of Civilization" [<https://www.amazon.com/Dirty-Electricity-Electrification-Diseases-Civilization/dp/193890818X>]

A Background / Curriculum Vitae, proactively, has been provided.

14. Describe Francis Hriadil's educational background, including, but not limited to, all institutions attended as well as all degrees and/or certifications obtained.

ANSWER:

- University of Pittsburgh, (Pittsburgh, PA)
 - School of Engineering
 - B. of Sc. Mechanical/Aerospace Engineering
 - (graduated Summa Cum Laude)
 - (accepted into Pi Tau Sigma - Honorary Mechanical Engineering Society)
 - (accepted into Sigma Tau - Engineering Honor Society)
 - (accepted into Tau Beta Pi - Engineering Honor Society)
 - (accepted into American Institute of Aeronautics and Astronautics)
 - Accepted into Graduate School
- Massachusetts Institute of Technology, M.I.T., (Cambridge, MA)
 - School of Engineering
 - Accepted into Graduate School; transferred to M.I.T
 - M.S. Aeronautics and Astronautics
 - (Thesis Supervisor - Dr. Richard Battin)
 - (graduated Summa Cum Laude)
 - (accepted into Sigma Xi - Scientific Research Society of North America)
 - Accepted into the Doctoral Program
 - Passed Generals
 - Began Thesis Research - (left the program for personal reasons)
- Quality, Productivity, and Competitive Position Course Graduate - Dr. W. Edwards Deming

15. Produce a copy of Francis Hriadil's current resume and/or curriculum vitae (CV).

ANSWER:

- University of Pittsburgh School of Engineering, (Pittsburgh, PA)
 - Graduate School Research Assistant
- Massachusetts Institute of Technology, (Cambridge, MA)
 - Graduate School Teaching Assistant
 - Research Assistant/Draper Fellow at the Charles Stark Draper Laboratories
- Northrop Corporation - Precision Products Division (PPD), Electronic Systems Group (Norwood, MA)
 - Classified and Unclassified Programs
 - Technical Staff, Systems Analyst - Tactical Systems Group,
Strategic Inertial Systems Group
 - Technical Resident/Office Manager - Hawthorne Operations
 - Member/Senior Member - Strategic Inertial Systems Group
 - Manager/Leader of Process Technology
- Innovative Cleaning Solutions, (Merrimack, NH)
 - Co-Founder, Co-owner
(Process Technology Design, Development, Consulting)
(Awarded Patent #5,402,806 - Cleaning Apparatus Having a Partitioned
Boil Sump, 1995)
(selected as an honored member of International Who's Who of
Entrepreneurs, 1998)
with professional subscriptions to Industrial Equipment News (IEN) trade
and industry Newsletters:
 - IEN Today
 - IEN Update
 - Industrial Management Today
 - Engineering News Today
- Internet Advantage, (Nashua, NH)
 - Owner
(Internet Consulting)
with professional subscriptions to many industry/trade journals including
but not limited to:
 - IT Security Bulletin
 - Information Week Today
 - CRN Technology News
 - Network Performance Bulletin
 - Redmond Report Newsletter
 - Oracle Magazine
 - Cloud Computing Bulletin

16. Has Francis Hriadil ever performed work or been employed in the scientific or medical fields?

ANSWER:

Francis Hriadil has had a long career performing work as a recognized engineering professional and inventor, on classified and unclassified programs, requiring expertise in engineering, analysis, advanced technology, mathematics, and physics.

17. If the answer to the preceding request was in the affirmative, state:

- a. The name of each employer that Francis Hriadil performed work for in the scientific or medical fields;
- b. Describe, in as much detail as possible, the specific duties that Francis Hriadil performed for each employer; and
- c. State the dates on which Francis Hriadil performed those duties.

ANSWER:

- 1976 - 1981: Massachusetts Institute of Technology, (Cambridge, MA)
 - Graduate School Teaching Assistant
 - Research Assistant/Draper Fellow at the Charles Stark Draper Laboratories
 - Advanced Guidance System Development and Analysis
- 1983 - 1994: Northrop Corporation - Precision Products Division (PPD), Electronic Systems Group (Norwood, MA)
 - Summary: The Analysis, Development, and Support of a Number of Classified and Unclassified Advanced Defense Technology Programs
 - Primarily worked on Classified Strategic Programs
- 1983 - 1987: Technical Staff, Systems Analyst
 - Tactical Systems Group
 - Advanced Tactical System Development and Analysis
 - Strategic Inertial Systems Group
 - Advanced Strategic System Analysis and Testing
 - Lead Engineer on the Division Re-certification Team
 - Vandenberg AFB On-site Testing Support

- 1988: Technical Resident/Office Manager - Hawthorne Operations
 - Division Technical Liaison, Advanced Strategic Systems Analysis and Testing
 - Established and Managed Hawthorne, CA Technical Liaison Office
- 1989 - 1993: Member/Senior Member - Strategic Inertial Systems Group
 - Advanced Systems Design, Development, Construction, Analysis, Testing, Integration, Training, Supervision
 - One of the leads in the development of new manufacturing line process technology. Co-inventor of a new, advanced, and innovative cleaning apparatus having a refrigerated vapor barrier and a partitioned boil sump.
- 1993 - 1994: Manager/Leader of Process Technology
 - Supervised Process Technology Group responsible for the Technical Support of the Division's Various Manufacturing Lines
 - Introduced New Methods and Processes to maintain and improve Manufacturing Yield
- 1994 - 2001: Innovative Cleaning Solutions, (Merrimack, NH; Nashua, NH)
 - Co-Founder, Co-owner
 - Process Technology Design, Development, Consulting
 - Design and Development of Advanced Industrial Technology focused on People, Product, and Environment
 - Awarded Patent #5,402,806 - Cleaning Apparatus Having a Partitioned Boil Sump, 1995
 - Selected as a member of International Who's Who of Entrepreneurs, 1998
- 2002 - Retirement: Internet Advantage, (Nashua, NH)

Owner, Internet Consulting

with professional subscriptions to many industry/trade journals including but not limited to:

 - IT Security Bulletin
 - Information Week Today
 - CRN Technology News
 - Network Performance Bulletin
 - Redmond Report Newsletter
 - Oracle Magazine
 - Cloud Computing Bulletin

18. Describe Michele Hriadil's educational background, including, but not limited to, all institutions attended as well as all degrees and/or certifications obtained.

ANSWER:

- University of Pittsburgh (Pittsburgh, PA)
 - School of Arts and Sciences
 - B. of Sc. Computer Science and Mathematics
(graduated Summa Cum Laude)

19. Produce a copy of Michele Hriadil's current resume and/or curriculum vitae (CV).

ANSWER:

- PPG, Inc., (Pittsburgh, PA)
 - Scientific Programmer/Analyst
 - Systems Analyst I
 - Systems Analyst II
- Dravo Automation Sciences, (Pittsburgh, PA)
 - Systems Analyst
- Hewlett Packard Enterprise Company, (Pittsburgh, PA)
(formerly Compaq Computer Corporation)
(formerly Digital Equipment Corporation)
 - Software Specialist III
 - Software Specialist IV
 - Technology Consultant I
 - Awards/Certifications:
 - MCSD Certification
 - Compaq Treasures Significant Contribution Award
 - Catch-a-Star Awards, Digital Equipment Corporation
 - Circle of Excellence Award, Digital Equipment Corporation II
- Contemporary Technologies, Inc, (Pittsburgh, PA)
 - Developer
- ColdCypress, (Bridgeville, PA)
 - Lead Developer
 - Systems Architect
- Pitt Ohio, (Pittsburgh, PA)
 - Application Developer

20. Has Michele Hriadil ever performed work or been employed in the scientific or medical fields.

ANSWER:

Michele Hriadil has had a long professional career, and is still employed, in the Computer Science and Information Technology field.

21. If the answer to the preceding request was in the affirmative, state:

- a. The name of each employer that Michele Hriadil performed work for in the scientific or medical fields;
- b. Describe, in as much detail as possible, the specific duties that Michele Hriadil performed for each employer; and
- c. State the dates on which Michele Hriadil performed those duties.

ANSWER:

- Professional Summary:

Extensive experience in the analysis, design, development, testing, implementation and support of custom software for complex distributed computer based systems. Technologies used include: ASP.NET, ASP, Ajax, Visual Basic, c#, SQL Server, Reporting Services, Crystal Reports, Javascript.

- Professional Experience:

- 1977 - 1985: PPG, Inc., (Pittsburgh, PA)
 - Scientific Programmer/Analyst, Systems Analyst I, Systems Analyst II
 - Administered and supported research computer systems.
 - Provided technical support to department staff for various applications.
 - Designed and developed applications, wrote documentation and conducted training.
 - Provided support to end users resolving hardware, system and application related problems.

- 1985 - 1987: Dravo Automation Sciences, (Pittsburgh, PA)
 - Systems Analyst
 - Designed and developed an application to automate the generation of an interface design document detailing network data transfers from a central data dictionary.
 - Developed and supported inter-process communication library routines used by project personnel.
 - Served as the backup for the system administrator.
- 1987 - 2001: Hewlett Packard Enterprise Company, (Pittsburgh, PA)
(formerly Compaq Computer Corporation)
(formerly Digital Equipment Corporation)
 - Software Specialist III, IV; Technology Consultant I
 - Led the development effort for a prototype system which collected psychiatric data from patients via web based forms and fed it into a data warehouse.
 - Led the technical implementation of a Y2K compliance effort for the computer systems of major steel manufacturer. Succeeded in upgrading all systems with little or no impact on production.
 - Designed, developed and tested several major components of a QA application which automated the comparison of test results with customer and industry specifications to insure compliance.
 - Developed a menu application to enable personnel to run the interactive functions of a managed care software package (IDX).
 - Designed and developed a major component of an inventory tracking application for advertising agency jobs. Directed the efforts of a subcontractor team responsible for coding relevant reports and provided technical support to the team.
- 2002 - 2003: Contemporary Technologies, Inc, (Pittsburgh, PA)
 - Developer
 - Developed utilities to track customer requirements through the development life cycle.
 - Developed detailed documentation on the purpose of each utility.
 - Assisted other developers with writing SQL scripts. .
- 2004 - 2009: ColdCypress, (Bridgeville, PA)
 - Lead Developer, Systems Architect
 - Developed/maintained a variety of custom ASP.NET web-based applications.
 - Created backend databases and developed stored procedures to support the web-based applications.
 - Developed reports in both Crystal Reports and SQL Reporting Services.

- 2011 - Present: Pitt Ohio, (Pittsburgh, PA)
 - Application Developer
 - Analyze, design, develop/enhance software applications to meet the needs of business Safety and Sales departments; includes database design, data integration, and reporting.
 - Primarily responsible for SAFETYBOX™, a web based fully inclusive system that combines information and functions from a variety of processes to form a best in class safety, compliance and risk management application. SAFETYBOX™ was selected for a CIO 100 award in 2013.
 - Also provide technical support to end users and business groups on-site, over the phone and through remote access.

This constitutes the documents that are available to the Complainants at this time.

Complainant's reserve the right to add to this information, and to these documents, as appropriate, as new information becomes available, and as the schedule allows.

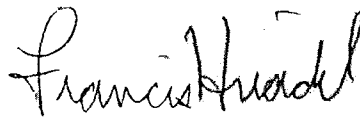
If audio/visual equipment will be available at the Hearing, which Complainants have not been able to verify at this time, Complainants will consider submitting a number of videos as Exhibits as well. But, that decision has not been made at this time.

VERIFICATION

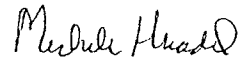
Per 52 Pa. Code S 1.36,

We, Francis Hriadil and Michele Hriadil, hereby state that the facts above set forth are true and correct (or are true and correct to the best of our knowledge, information and belief) and that we expect to be able to prove the same at a hearing held in this matter. We understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

Date: 10/26/2017

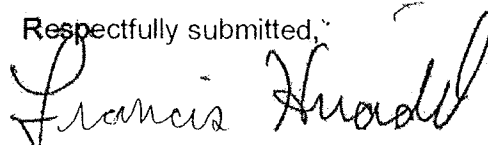


Francis Hriadil



Michele Hriadil

Respectfully submitted,



Francis Hriadil
(412) 779-3314
331 Shady Ridge Drive
Monroeville, PA 15146
October 26, 2017

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

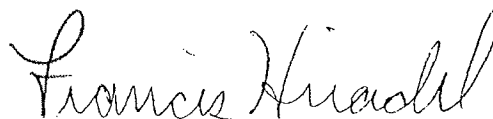
CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the Complainant's Response to Respondent's First Set of Discovery Requests Directed to Complainants, verified as per 52 PA. Code S 1.36, upon the participant listed below in accordance with the requirements of 52 PA. Code § 1.54 (relating to service by a participant):

Jeremy V Farrell, Esquire
Paul S Miller, Esquire
1500 One PPG Place
Pittsburgh, PA 15222
(412) 594-5619 (Fax)

Counsel for Respondent, Duquesne Light Company

Dated this 26th day of October, 2017



Michele and Francis Hriadil
331 Shady Ridge Drive
Monroeville, PA 15146

(412) 779-3314
hriadil@attglobal.net

Appendix Tab 10

331 Shady Ridge Drive
Monroeville, PA 15146

January 12, 2018

Via Paper Filing

Jeremy V. Farrell, Esquire
TUCKER ARENSBERG, P.C.
1500 One PPG Place
Pittsburgh, PA 15222

RE: **Michele Hriadil and Francis Hriadil v. Duquesne Light Company**
Docket No. C-2016-2571726

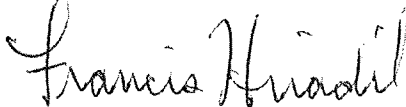
Dear Jeremy V. Farrell, Esquire, Counsel for Duquesne Light Company:

As Respondent's Counsel, enclosed please find Complainant's Additional Documents in Response to Respondent's Second Set of Discovery Requests Directed to Complainants, verified as per 52 Pa. Code S 1.36.

Complainant's Certificate of Service has been filed with the Commission's Secretary, per Judge Watson's October 3, 2017 Interim Order, in accordance with Commission regulations.

Please feel free to contact me if you have any questions.

Sincerely,



Francis Hriadil
Complainant
(412) 779-3314
hriadil@attglobal.net

Enclosure

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

**RESPONSE TO RESPONDENT'S
SECOND SET OF DISCOVERY
REQUESTS DIRECTED TO
COMPLAINANTS**

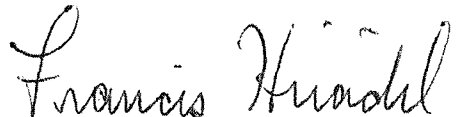
Filed by Michele and Francis Hriadil

hriadil@attglobal.net
(412) 779-3314
331 Shady Ridge Drive
Monroeville, PA 15146

**RESPONSE TO RESPONDENT'S
SECOND SET OF DISCOVERY REQUESTS DIRECTED TO COMPLAINANTS**

THIS IS COMPLAINANTS RESPONSE TO RESPONDENT'S SECOND SET OF DISCOVERY REQUESTS.

A CERTIFICATE OF SERVICE HAS BEEN FILED WITH THE COMMISSION'S SECRETARY, PER JUDGE WATSON'S OCTOBER 3, 2017 INTERIM ORDER.



Francis Hriadil
January 12, 2018

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

MICHELE HRIADIL and
FRANCIS HRIADIL,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

**RESPONSE TO RESPONDENT'S
SECOND SET OF DISCOVERY REQUESTS DIRECTED TO COMPLAINANTS**

TO THE RESPONDENT:

This submission comprises the Complainants response to the Respondent's Second Set of Discovery Requests Directed to Complainants.

It includes:

- this main document, which addresses the Respondent's specific Discovery questions,
- plus, documents, references, and sources, not previously provided, or not previously provided in full, that we intend to offer into evidence:
 - Discovery Request 2 - 2017 Family Plan Verizon Bills (6 months)
 - Discovery Request 3 - 6 Equipment Manuals
 - Discovery Request 15 - 1 Exhibit Document, F-49.
 - Discovery Request 16 - 1 Exhibit Document, F-50.
 - Discovery Request 31 - 6 Exhibit Documents, E-62 to E-68.
2 Curriculum Vitae Documents, CV-5 to CV-6.

Complainants have made a conscientious and concerted effort to respond to the Respondent's specific Discovery questions to the best of our ability at this time. If any new documents are acquired, or any new developments occur, the Respondent will be notified and updated in as timely of a manner as possible.

Complainants are submitting this response in accordance with 52 Pa. Code S 1.36.

DISCOVERY REQUESTS

1. Identify the type (with make and model) of all devices, appliances, and equipment used in Your home or by You in Your daily life that produce radio frequency or low frequency fields, including, but not limited to, cell phones, microwave ovens, wireless internet, and WI-FI routers.

ANSWER:

- Cell Phone - Verizon Samsung Note 3 SM-N900V (normally off unless in use)
(shielded with Faraday bag)
- Wi-Fi Router - Verizon FIOS Router MI424WR (normally off unless in use)
- Dell XPS 15 9560 laptop (normally off unless in use)
- Desktop Computer - Custom built w Netgear N300 USB WNA3100 (normally off unless in use)
- Brother Multi-Function Printer - MFC-J870DW (normally off unless in use)
- Microsoft Xbox 360 (normally off unless in use)

Note: (USB hardline cords are used to connect these devices whenever possible. WiFi is used only as needed.)

2. For each cell phone identified in response to the preceding request, produce the last six months of bills or other usage records for the phone with sufficient detail to show Your actual usage for that period.

ANSWER:

The following document is attached: (6 months)

2017 Family Plan Verizon Bills: Jun 11 - Jul 10, Jul 11 - Aug 10, Aug 11 - Sep 10,
Sep 11 - Oct 10, Oct 11 - Nov 10, Nov 11 - Dec 10

3. Produce all Documents, including, but not limited to, user manuals and instructional materials, relating to each device identified in response to Request No. 1.

ANSWER:

The following manuals are attached: **Manuals are provided on the included DVD.**

- Verizon Samsung Note 3 SM-N900V

- Verizon FIOS Router MI424WR
- Dell XPS 15 9560
- Desktop Computer Netgear N300 WNA3100
- Brother MFC-J870DW
- Xbox 360

4. Has Francis Hriadil ever installed, or participated in the installation of, an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter at a residential or commercial structure? If so, state:

- a. The number of times Francis Hriadil has installed such a meter;
- b. The address of each location where Francis Hriadil installed such a meter;
- c. The date of each instance when Francis Hriadil installed such a meter; and
- d. The name, address, and telephone number of any individual who witnessed Francis Hriadil install such a meter.

ANSWER:

No.

5. Produce all Documents that relate to Your response to the preceding request.

ANSWER:

None.

6. Has Michele Hriadil ever installed, or participated in the installation of, an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter at a residential or commercial structure? If so, state:

- a. The number of times Michele Hriadil has installed such a meter;
- b. The address of each location where Michele Hriadil installed such a meter;
- c. The date of each instance when Michele Hriadil installed such a meter; and
- d. The name, address, and telephone number of any individual who witnessed Michele Hriadil install such a meter.

ANSWER:

No.

7. Produce all Documents that relate to Your response to the preceding request.

ANSWER:

None.

8. Has Francis Hriadil ever witnessed the installation of an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter at a residential or commercial structure? If so, state:

- a. The number of times Francis Hriadil witnessed an installation of such meter;
- b. The address of each location where Francis Hriadil witnessed the installation of such a meter; and
- c. The date of each instance when Francis Hriadil witnessed the installation of such a meter.

ANSWER:

Yes. On 10/9/2016, Francis Hriadil observed the Wellington Energy Meter Exchanger installing Duquesne Light's SK9AMI7 meters in our neighborhood, and on our neighboring condominium units, near 331 Shady Ridge Drive.

9. Produce all Documents that relate to Your response to the preceding request.

ANSWER:

None.

10. Has Michele Hriadil ever witnessed the installation of an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter at a residential or commercial structure? If so, state:

- a. The number of times Michele Hriadil witnessed an installation of such meter;
- b. The address of each location where Michele Hriadil witnessed the installation of such a meter; and
- c. The date of each instance when Michele Hriadil witnessed the installation of such a meter.

ANSWER:

No.

11. Produce all Document that relate to Your response to the preceding request.

ANSWER:

None.

12. Has Francis Hriadil ever personally inspected an Itron SK9AMI7 HW 3.1

OpenWay CENTRON Singlephase Smart Meter? If so:

- a. State each date on which Francis Hriadil inspected such a meter;
- b. State the address of the location where each such meter was inspected;
- and
- c. Describe in detail how each inspection was performed.

ANSWER:

Yes. Francis Hriadil carried out a visual inspection of the newly installed Smart Meter on our neighbor's residence to see if a UL Mark was present, and to see if any safety warning label(s) were attached. Francis Hriadil did not at any time touch the meter.

13. Produce all Documents that relate to Your response to the preceding request.

ANSWER:

None.

14. Do You claim that there has been a fire(s) caused by an Itron SK9AMI7 HW 3.1

OpenWay CENTRON Singlephase Smart Meter installed by Duquesne Light or its contractors?

If so, for each such fire, state:

- a. The date of the fire;
- b. The address of the location where the fire happened; and
- c. All facts that support Your contention or belief that the fire was caused by an

Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter installed by Duquesne

Light or its contractors.

ANSWER:

All that Complainants can state at this time is that no Smart Meter installed in their neighborhood, has as yet been involved in a fire that they are aware of.

Beyond that, Complainants do not have observability throughout Respondent's service area. Complainants have served Set #1 of Discovery Requests to Respondent to disclose any such incidents and/or occurrences which Respondent has refused to answer.

In Complainants response to Respondent's Discovery Request #1, Complainants supplied numerous documented reports of Smart Meter involved fires, etc. involved outside of its service area that involved the same SK9AMI7 Smart Meter being deployed by the Respondent, as well as other model types, both here in Pennsylvania and elsewhere. Refer to those submissions.

15. Produce all Documents that relate to Your response to the preceding request.

ANSWER:

Documents were provided in Complainants Discovery Response #1 (served October 26, 2017) and Response #2 (served December 4, 2017) to Respondent's First Set of Discovery requests. Those documents, as well as all documents that have already been served on the Respondent by the Complainants since Complainants filed their Formal Complaint, are incorporated here-in by reference as if fully restated.

Complainants submit the following additional document:

- **Exhibit F-49: FortisBC's Notice for Smart Meters, Dangerous Installation and Real Liability**, Curtis Bennett, Chief Science Officer, Adjunct Professor for Accredited Medical Education. Thermal Radiation Consultant, Report to the City of Kelowna Mayor and Council, Jan 2015, (FortisBC deploys the same SK9AMI7 Smart Meter as the Respondent)
[<http://thermoguy.com/wp-content/uploads/City-of-Kelowna-on-FortisBC-Smart-Meter-Installation-and-Fires.pdf>]

16. Do You claim there has been a privacy, data, or security breach to Duquesne Light's customers caused by an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter? If so, for each such breach, state:

- a. The date of each breach;
- b. The nature of information breached; and
- c. All facts that support Your contention or belief that the breach was caused by an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter.

ANSWER:

Complainants have no observability into the inner workings or incidents at the Respondent. Complainants claim that Respondent's security integrity is no better than the best security systems being implemented by government, business, and industry, that have already encountered serious breaches, many of which have been widely-reported in the press and trade industry publications. And as such, Respondent cannot guarantee Complainants privacy and security. Many experts have warned of the vulnerabilities.

What worsens the situation is that the Respondent's Smart Meter and Mesh Network, by its very structure has hundreds of thousands of potentially hackable entry points. The Smart Meter itself, including the Respondent's SK9AMI7 OpenWay Smart Meter, has been highlighted as one of the weakest links in the Smart Network, and there are hundreds of thousands of them that have been deployed by the Respondent.

Complainants have served Set #1 of Discovery Requests to Respondent to disclose any such incidents and/or occurrences.

17. Produce all Documents that relate to Your response to the preceding request.

ANSWER:

Documents were provided in Complainants Discovery Response #1 (served October 26, 2017) and Response #2 (served December 4, 2017) to Respondent's First Set of Discovery requests. Those documents, as well as all documents that have already been served on the

Respondent by the Complainants since Complainants filed their Formal Complaint, are incorporated here-in by reference as if fully restated.

Complainants submit the following additional document: :

- Exhibit F-50: MSP's Guide to 3 Game-Changing Problems in Security, Redmond Channel Partner, RCPmag.com, Scott Bekker Investigative Report November/December 2017, [<https://rcpmag.com/whitepapers/2017/11/solariwnds-msps-guide-to-3-game-changing-problems.aspx?tc=page0>]

18. Outside of the Documents and pleadings already produced in connection with Your Formal Complaint, produce any Document prepared in whole or in part by Francis Hriadil that relates to the subject of radio frequency or low frequency radiation.

ANSWER:

None that are not work-product.

19. Outside of the Documents and pleadings produced in connection with this Formal Complaint, produce any Document prepared in whole or in part by Michele Hriadil that relates to the subject of radio frequency or low frequency radiation.

ANSWER:

None.

20. Did Francis Hriadil ever perform any job responsibilities or engage in a course of study specifically relating to radio frequency or low frequency radiation? If so, describe each job responsibility and/or course of study in detail.

ANSWER:

No.

21. Produce all Documents that relate to Your response to the preceding request.

ANSWER:

None.

22. Did Michele Hriadil ever perform any job responsibilities or engage in a course of study specifically relating to radio frequency or low frequency radiation? If so, describe each job responsibility and/or course of study in detail.

ANSWER:

No.

23. Produce all Documents that relate to Your response to the preceding request.

ANSWER:

None.

24. Is Francis Hriadil a certified electrician? If so, state the date of certification.

ANSWER:

No. But, Francis Hriadil has extensive technical expertise and background in the design development, manufacture, programming, installation, and support of highly technical equipment incorporating and integrating, electronic, mechanical, refrigeration, ultrasonic, and fluid/solvent control technology, etc. He has been recognized for his systems analysis expertise, his ability to understand, analyze, and integrate diverse technology, and has been granted a patent on a sophisticated and innovative process technology device incorporating such diverse technologies.

25. Is Michele Hriadil a certified electrician? If so, state the date of certification.

ANSWER:

No. Michele Hriadil's area of expertise has been provided in Complainants Discovery Response #1 (served October 26, 2017).

26. For Michele Hriadil, identify all medical conditions that make her vulnerable to, or that would be aggravated by, proximity to an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter.

ANSWER:

This was answered in Complainants response to Respondent's First Set of Discovery requests.

To reiterate, all people, by the fact that they are human beings, are vulnerable to the pulsed emissions being produced by wireless Smart Meters, such as the Respondent's Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter, irrespective of the presence of any medical/health conditions. No human being is completely immune to its effects, which accumulate over time. A healthy person today can become unhealthy in the future as a result.

Certain groups or classes of people are at especially high risk of harm from exposure to those emissions, namely, pregnant women and their unborn children, very young children, teenagers, men of reproductive age, seniors, and anyone with a chronic health condition.

People from all of these groups, with any number of various medical/health conditions, have visited and will continue to visit the Hriadil's property and residence and will be subject to the emissions.

All people, and Michele Hriadil is one of the people of Pennsylvania, are living human beings. Michele Hriadil is a woman, and is elderly. She is generally in good health at this time, and wishes to remain so.

27. Produce all Documents, including but not limited to hospital and/or medical records and studies, demonstrating that Michele Hriadil suffers from the medical condition(s) identified in Your response to Request No. 26.

ANSWER:

None provided at this time, because Complainants and Respondent are discussing a non-disclosure confidentiality agreement.

Furthermore, no medical condition(s) are being claimed by Michele Hriadil in Request No 26.

28. Produce all Documents, including but not limited to hospital and/or medical records and studies, demonstrating the relationship between the medical condition(s) identified in Your response to Request No. 26 and Michele Hriadil's proximity to an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter.

ANSWER:

Documents were provided in Complainants Discovery Response #1 (served October 26, 2017) and Response #2 (served December 4, 2017) to Respondent's First Set of Discovery requests. Those documents, as well as all documents that have already been served on the Respondent by the Complainants since Complainants filed their Formal Complaint, are incorporated here-in by reference as if fully restated.

Furthermore, no medical condition(s) are being claimed by Michele Hriadil in Request No 26.

29. For Francis Hriadil, identify all medical condition(s) that make him vulnerable to, or that would be aggravated by, proximity to an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter.

ANSWER:

This was answered in Complainants response to Respondent's First Set of Discovery requests.

To reiterate, all people, by the fact that they are human beings, are vulnerable to the pulsed emissions being produced by wireless Smart Meters, such as the Respondent's Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter, irrespective of the presence of any medical/health conditions. No human being is completely immune to its effects, which accumulate over time. A healthy person today can become unhealthy in the future as a result.

Certain groups or classes of people are at especially high risk of harm from exposure to those emissions, namely, pregnant women and their unborn children, very young children, teenagers, men of reproductive age, seniors, and anyone with a chronic health condition.

People from all of these groups, with any number of various medical/health conditions, have visited and will continue to visit the Hriadil's property and residence and will be subject to the emissions.

All people, and Francis Hriadil is one of the people of Pennsylvania, are living human beings. Francis Hriadil is a man, and is elderly. His specific chronic medical conditions have been provided in Complainants response to Respondent's First Set of Discovery requests.

30. Produce all Documents, including but not limited to hospital and/or medical records and studies, demonstrating that Francis Hriadil suffers from the medical condition(s) identified in Your response to Request No. 29.

ANSWER:

Not provided at this time, because Complainants and Respondent are discussing a non-disclosure confidentiality agreement.

31. Produce all Documents, including but not limited to hospital and/or medical records and studies, demonstrating the relationship between the medical condition(s) identified in Your response to Request No. 29 and Francis Hriadil's proximity an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter.

ANSWER:

Documents were provided in Complainants Discovery Response #1 (served October 26, 2017) and Response #2 (served December 4, 2017) to Respondent's First Set of Discovery requests. Those documents, as well as all documents that have already been served on the Respondent by the Complainants since Complainants filed their Formal Complaint, are incorporated here-in by reference as if fully restated.

Complainants submit the following additional documents:

- **Exhibit E-62:** Functional brain MRI in patients complaining of electrohypersensitivity after long term exposure to electromagnetic fields. Gunnar Heuser* and Sylvia A. Heuser Rev Environ Health 2017; 32(3): 291–299 Volume 32 (September 2017) of De Gruyter's Reviews on Environmental Health
[<https://www.degruyter.com/downloadpdf/j/reveh.2017.32.issue-3/reveh-2017-0014/reveh-2017-0014.pdf>]
- **Exhibit E-63:** Health Effects of Microwave Radio Exposures - Acute Symptoms from RF Exposure: "EHS", Paul Dart MD FCA, Sep 3, 2013, Notice of Inquiry, filed with the FCC, ET Docket No. 13-84,
[<https://www.fcc.gov/ecfs/filing/6017465430>]
[<https://ecfsapi.fcc.gov/file/7520940904.pdf>]
- **Exhibit E-64:** Martin Pall, PhD Letter to CA Legislators re. SB.649 on the Harmful Effects of Electromagnetic Fields on Health, August 07, 2017,
[<https://ehtrust.org/wp-content/uploads/Pall-Letter-to-CalLegis-FINAL-8-7-17.pdf>]
- **Exhibit E-65:** Reduce EMF Exposure and The Harmful Effects of Electromagnetic Fields on Health: A Special Interview with Dr. Martin Pall, Joseph Mercola DO, January 08, 2018, Investigative Health/Medical Report,
[<https://articles.mercola.com/sites/articles/archive/2018/01/08/reduce-emf-exposure.aspx>]
- **Exhibit E-66:** HEALTH_10 - 58 min - video - 2017_08 E-65 HEALTH_10 - video - 2017_08_20 - 58 min - Dr Mercola Interviews Martin Pall on EMFs,
[<https://www.youtube.com/watch?v=ZAqmT9KJBC8>]
Video document is provided on the included DVD.

Curriculum Vitae of Document Authors:

- **Exhibit CV-5:** Joseph M Mercola, DO
A Background / Curriculum Vitae has been provided.
- **Exhibit CV-6:** Martin L Pall, PhD
A Background / Curriculum Vitae has been provided.

32. Describe in detail how proximity to an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter would adversely affect the "chronic musculoskeletal and digestive conditions" that Francis Hriadil allegedly suffers from, as set forth in Your Response to Respondent's First Set of Discovery Requests Directed to Complainants.

ANSWER:

Medical/health experts have reported the adverse effect of exposure to RF emissions on musculoskeletal and digestive conditions, as well as many other conditions.

33. To the extent not previously requested, produce all Documents, including but not limited to hospital and/or medical records and studies, demonstrating the relationship between any "chronic musculoskeletal and digestive conditions" that Francis Hriadil may suffer from and his proximity to an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter.

ANSWER:

Documents were provided in Complainants Discovery Response #1 (served October 26, 2017) and Response #2 (served December 4, 2017) to Respondent's First Set of Discovery requests. Those documents, as well as all documents that have already been served on the Respondent by the Complainants since Complainants filed their Formal Complaint, are incorporated here-in by reference as if fully restated.

34. Describe in detail how proximity to an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter could lead to an increase in "tinnitus" for Francis Hriadil, as alleged in Your Response to Respondent's First Set of Discovery Requests Directed to Complainants.

ANSWER:

Medical/health experts have reported the adverse effect of exposure to RF emissions on tinnitus, leading to onset of the condition, or the worsening of the condition if it already exists.

35. To the extent not previously requested, produce all Documents, including but not limited to hospital and/or medical records and studies, demonstrating the relationship between Francis Hriadil's alleged tinnitus and his proximity to an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter.

ANSWER:

Documents were provided in Complainants Discovery Response #1 (served October 26, 2017) and Response #2 (served December 4, 2017) to Respondent's First Set of Discovery requests. Those documents, as well as all documents that have already been served on the Respondent by the Complainants since Complainants filed their Formal Complaint, are incorporated here-in by reference as if fully restated.

36. To the extent not previously requested, produce all Documents, including but limited to hospital and/or medical records and studies, that relate to Your claim that Duquesne Light's installation of an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter at the Property will negatively affect Michele Hriadil's health or condition(s), as alleged throughout Your Formal Complaint.

ANSWER:

See response to Discovery Request No. 37.

37. To the extent not previously requested, produce all Documents, including but not limited to hospital and/or medical records, that relate to Your claim that Duquesne Light's installation of an Itron SK9AMI7 HW 3.1 OpenWay CENTRON Singlephase Smart Meter at the Property will negatively affect Francis Hriadil's health or medical condition(s), as alleged throughout Your Formal Complaint.

ANSWER:

Documents were provided in Complainants Discovery Response #1 (served October 26, 2017) and Response #2 (served December 4, 2017) to Respondent's First Set of Discovery requests. Those documents, as well as all documents that have already been served on the Respondent by the Complainants since Complainants filed their Formal Complaint, are incorporated here-in by reference as if fully restated.

Complainants submit the following additional documents:

- **Exhibit E-67:** 2018 ICD-10-CM/PCS Medical Diagnosis Coding Reference – International Classification of Diseases - Exposure to Radiofrequency, [<http://www.icd10data.com/ICD10CM/Codes/V00-Y99/W85-W99/W90-W90.0>]
- **Exhibit E-68:** Outdated FCC "Safety" Standards, Enviromental Health Trust Report, [<https://ehtrust.org/policy/fcc-safety-standards/>]

This constitutes the documents that are available to the Complainants at this time.

Complainant's reserve the right to add to this information, and to these documents, as appropriate, as new information becomes available, and as the schedule allows.

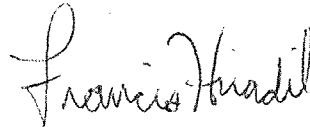
VERIFICATION

Per 52 Pa. Code S 1.36,

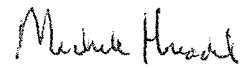
We, Francis Hriadil and Michele Hriadil, hereby state that the facts above set forth are true and correct (or are true and correct to the best of our knowledge, information and belief) and that we expect to be able to prove the same at a hearing held in this matter. We understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities).

Date: 1/12/2018

1/12/2018

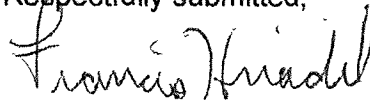


Francis Hriadil



Michele Hriadil

Respectfully submitted,



Francis Hriadil
(412) 779-3314
331 Shady Ridge Drive
Monroeville, PA 15146
January 12, 2018

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Michele Hriadil and
Francis Hriadil,

Complainant,

vs.

DUQUESNE LIGHT COMPANY,

Respondent.

No: C-2016-2571726

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a true copy of the Complainant's Response to Respondent's Second Set of Discovery Requests Directed to Complainants, verified as per 52 PA.Code S 1.36, upon the participant listed below in accordance with the requirements of 52 PA. Code § 1.54 (relating to service by a participant):

Jeremy V Farrell, Esquire
Paul S Miller, Esquire
1500 One PPG Place
Pittsburgh, PA 15222
(412) 594-5619 (Fax)

Counsel for Respondent, Duquesne Light Company

Dated this 12th day of January, 2018



Michele and Francis Hriadil
331 Shady Ridge Drive
Monroeville, PA 15146

(412) 779-3314
hriadil@attglobal.net

Appendix Tab 11

E-6



Institute for Health and the Environment



WHO Collaborating Center
in Environmental Health

22 October 2017

Pennsylvania Public Utilities Commission
400 North Street
Harrisburg, Pennsylvania 17120

Judge Jeffrey Watson
PA PUC Pittsburgh Administrative Law Judge Office
310 Fifth Ave, Suite 220
Piatt Place
Pittsburgh, PA 1222

Re: Case C-2016-2571726

Dear Sirs/Madams:

This is concerning potential adverse health effects associated with exposure to radiofrequency (RF) radiation, specifically that from electronic utility meters. I am a public health physician and former Dean of the School of Public Health at the University at Albany. I have been involved in review and analysis of studies on electromagnetic fields, including radiofrequency fields, for many years. I served as the Executive Secretary to the New York State Powerlines Project in the 1980s, and have published several reviews on the subject. In addition I was invited to present to the recent President's Cancer Panel on the subject of powerline and radiofrequency fields and cancer, and the publication that came from that Panel is attached. I have edited two books on effects of EMFs, including RF radiation. I served as the co-editor of the Bioinitiative Report (www.bioinitiative.org), a comprehensive review of the literature on this subject. The public health chapter from this report was subsequently published in a peer reviewed journal, which is attached. This is a subject which I know well, and one on which I take a public health approach that has as a fundamental principle the need to protect against risk of disease even when one does not have all the information that would be desirable.

There is clear and strong evidence that intensive use of cell phones increases the risk of brain cancer, tumors of the auditory nerve and cancer of the parotid gland, the salivary gland in the cheek by the ear. The evidence for this conclusion is detailed in many publications in the peer-reviewed scientific literature. Most recently the National Toxicology Program reported that chronic exposure of rats to cell phone radiation resulted in the development of the same kinds of brain cancer and auditory nerve tumors (although in this case in the heart not the ear) that are seen in human using cell phones excessively. Electronic meters use similar radiofrequency radiation, in some cases exposing the whole body to levels of radiofrequency radiation similar to cell phones. The difference between a cell phone and an electronic meter environment is that while the cell phone is used only intermittently a smart meter environment is continuous. There is also strong evidence that leukemia rates are increased among people living near to powerful AM radio transmission towers. Because WiFi, radio transmission towers and electronic meters all generate similar RF radiation, my conclusion is that if the whole body is exposed, leukemia is

the major cancer of concern, while if only the head is exposed as in using a cell phone, one sees increased risk of local cancers, such as brain cancer. There are a variety of other health effects reported as a result of exposure to RF radiation, but in my judgment the increased risk of cancer is both the best documented and the disease of greatest concern.

There have been few careful studies specifically of the health effects of electronic meters to my knowledge, in great part because they haven't been around very long. But they utilize the same type of RF radiation that is used in cell phones. It should be noted that the World Health Organization has declared radiofrequency radiation to be a possible human carcinogen. While it is true that the nature of exposure to RF from electronic meters is not significantly different from that coming from other wireless devices, what is important is cumulative, aggregate exposure. My position is that we should practice "prudent avoidance", which is to say reduce unnecessary exposure to the degree possible until the magnitude of risk is fully understood.

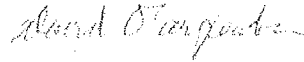
My specific concerns about electronic meters are as follows:

1. The benefit of the electronic meters is entirely to the utilities, and is economic in nature. If they install these meters they can fire those individuals who at present are employed to go around reading meters. Thus this is a job-killing proposal, and will increase unemployment which is already too high.
2. When an electronic meter is installed residents have no choice in the matter or ability to avoid exposure. But every individual has the option to use or not use other personal wireless devices. There is a major difference between an exposure which an individual chooses to accept and one that is forced on individuals who can do nothing about it.
3. Most electronic meters transmit signals to the utility for relatively short periods of time, but generate radiofrequency pulses at frequent intervals all day and night. Thus the device continuously generates RF radiation that will expose anyone nearby 24/7.
4. The evidence for adverse effects of radiofrequency radiation is currently strong and grows stronger with each new study. Analog meters with shielded cable do not increase exposure.
5. The installation of these meters also pose security and privacy concerns as they will allow the utility to monitor individual appliance usage and can be hacked.

As a public health physician with specific expertise in the human effects of radiofrequency radiation, I urge you to require Duquesne Light Company to install analog meters where residents request them. At the very least individuals concerned about their health and the health of their families should be allowed to choose an analog meter. Analog meters have withstood the test of time for safety and are not a source of RF radiation. Installation of electronic meters will adversely affect the health of Pennsylvania residents and will ultimately invite legal action arising from the development of diseases known to be associated with exposure to RF radiation.

Thank you for the opportunity to comment on this important public health concern, and on the general issue of electronic meters. The use of electronic utility meters is unwise from both a public health point of view, which is where my expertise lies, but and also from a purely short and long-term economic point of view.

Yours sincerely,

A handwritten signature in cursive script, appearing to read "David O. Carpenter".

David O. Carpenter, M.D.

Director

Institute for Health and the Environment
University at Albany

Appendix Tab 13

**PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA 17105-3265**

Public Meeting held March 2, 2017

Commissioners Present:

Gladys M. Brown, Chairman, Statement
Andrew G. Place, Vice Chairman
John F. Coleman, Jr.
Robert F. Powelson, Statement
David W. Sweet, Statement

Petition of Duquesne Light Company
for Approval to Modify its Smart Meter
Procurement and Installation Plan

P-2015-2497267

OPINION AND ORDER

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BY THE COMMISSION:

I. Matter Before the Commission

Before the Pennsylvania Public Utility Commission (Commission) for consideration and disposition are the Exceptions of Duquesne Light Company (Duquesne or the Company) and the Office of Consumer Advocate (OCA) filed on November 28, 2016, to the Initial Decision of Administrative Law Judge (ALJ) Katrina L. Dunderdale issued on November 8, 2016, relative to the above-captioned proceeding. On December 8, 2016, Replies to Exceptions were submitted by Duquesne and the OCA. For the reasons stated below, we shall deny the Exceptions and adopt the ALJ's Initial Decision.

II. Background

On October 15, 2008, House Bill 2200 was signed into law as Act 129 with an effective date of November 14, 2008. Among other requirements, Act 129 specifically directed that within nine months of its effective date, electric distribution companies (EDCs) were to file, with the Commission for approval, a smart meter technology procurement and installation plan (SMP). 66 Pa. C.S. § 2807(f)(1). On June 24, 2009, the Commission issued its Smart Meter Procurement and Implementation Order at Docket No. M-2009-2092655 (*Implementation Order*), which established the standards that EDCs must meet for providing smart meter technology to customers and also provided guidance for meeting those standards.

On August 14, 2009, Duquesne filed its Initial Smart Meter Procurement and Installation Plan (Initial SMP) with the Commission. The Commission entered an Order on May 11, 2010, approving Duquesne's Initial SMP, with certain modifications. Thereafter, on June 29, 2012, Duquesne filed its Petition for Approval of its Final Smart Meter Plan. As a result, by Order entered on May 6, 2013, the Commission granted Duquesne's Petition to implement its Final SMP with certain modifications, at Docket No. M-2009-2123948, as required by Act 129. That Order directed Duquesne to make a compliance filing providing data supporting whether or not the inclusion of communication of outages and restoration and voltage monitoring capabilities were cost effective. Duquesne submitted its Compliance Filing on August 2, 2013, and the Commission approved the Compliance Filing by Order entered January 9, 2014.¹

¹ Duquesne St. No. 2 at 3.

III. History of the Proceeding

Duquesne filed the instant Petition on August 4, 2015, seeking approval to modify its SMP. The Petition seeks to implement changes to its approved SMP for the purpose of enhancing outage communication and voltage monitoring capabilities, and to recover the costs associated with those changes through the Smart Meter Charge (SMC).

On August 24, 2015, Answers to the Petition were submitted by the OCA and Citizen Power, Inc. (Citizen Power). On September 4, 2015, the Office of Small Business Advocate (OSBA) filed a Notice of Intervention. Thereafter, on October 14, 2015, the ALJ issued a Prehearing Order and issued a Hearing Notice scheduling the matter for evidentiary hearings on February 17, 2016, through February 19, 2016.

On January 21, 2016, Duquesne filed a Motion for Protective Order. On January 22, 2016, the ALJ issued the requested Protective Order due to the presence of proprietary and/or confidential information.

On February 18, 2016, the ALJ conducted an initial evidentiary hearing, wherein the Parties agreed to waive cross-examination of the written testimonies served previously. During this hearing, the ALJ admitted the written testimonies of Duquesne and OCA into the record.

On March 17, 2016, Main Briefs (M.B.) were filed by Duquesne, the OCA and Citizen Power. Reply Briefs (R.B.) were filed by Duquesne, the OCA and Citizen Power on April 7, 2016. The record was closed on April 11, 2016, upon the issuance of the Interim Order Closing the Record.

Subsequently, on May 4, 2016, the ALJ issued a Post-Hearing Order which reopened the record and scheduled a call-in telephonic post-hearing conference for

May 17, 2016, at which time the Parties were ordered to be prepared to discuss and agree to a revised litigation schedule. The ALJ stated that more cost information was needed to further evaluate Duquesne's smart meter costs and directed Duquesne to answer the following four questions:

- 1) How much of the reasonable and prudent costs of the installation of the [Outage Management System (OMS)] and [Advanced Distribution Management System (ADMS)] relate to the voltage monitoring and outage communications capabilities and how much are related to providing the multitude of other functionalities?
- 2) How much of those costs should be recovered through the [Smart Meter Charge (SMC)]?
- 3) Does Duquesne Light need to have a full-blown OMS and ADMS to provide the voltage monitoring and outage communication capabilities, or could those be provided through other means, or a more scaled-back process?
- 4) Without opining on the overall benefits of the systems, should rate payers be required to pay the costs of the OMS and ADMS on a full and current basis through the SMC, or are the non-smart meter functionality portions of those costs more appropriately recovered through base rates over a number of years? The other EDCs required to implement smart meters already had sophisticated OMS that were paid through base rates. Should Duquesne Light rate payers now be required to pay for such an upgrade outside of the normal base rate process just to add two additional functionalities to their smart meters?

The ALJ also directed the Company and the OCA to discuss whether information marked as "Confidential" was properly characterized in certain written testimonies. At the request of the Parties, the date of the post-hearing conference was moved to May 24, 2016.

On May 24, 2016, the ALJ conducted a post-hearing conference wherein the Parties considered the issues raised in the May 4, 2016 Order, agreed to suspend the litigation schedule, and established a further litigation schedule. Lastly, the Parties discussed whether information in previously-admitted written statements was properly characterized as “Confidential.”

Subsequently, on May 25, 2016, the ALJ issued the Second Post-Hearing Order which suspended the litigation schedule, directed Duquesne to respond to the four enumerated inquiries, provided all Parties with an opportunity to serve supplemental direct and/or supplemental rebuttal written testimony, and directed the Parties to appear at a further evidentiary hearing on June 30, 2016.

On June 30, 2016, the ALJ conducted the Further Hearing at which all Parties were present. Duquesne and the OCA presented additional written testimony which was admitted into the record. During this hearing, Duquesne requested the opportunity to submit a brief and, possibly, a reply brief. The other Parties agreed and a briefing schedule was agreed to by the Parties. Thereafter, on July 1, 2016, the ALJ issued the Third Post-Hearing Order which established a briefing schedule and ordered that each Party filing a Main Brief and/or Reply Brief was presumed to have rescinded any Main Brief/Reply Brief previously filed in this proceeding. On July 20, 2016, Main Briefs were filed by Duquesne, the OCA and Citizen Power. On July 27, 2016, Reply Briefs were filed by these same Parties.

On August 15, 2016, the ALJ issued the Fourth Interim Order which closed the record. On November 8, 2016, the Commission issued the ALJ’s Initial Decision that granted Duquesne’s Petition, in part, and denied it, in part.

On November 21, 2016, Citizen Power filed a Petition to Withdraw from this proceeding pursuant to the Rules of Practice and Procedure at 52 Pa. Code § 5.94.

Citizen Power explained that it has temporarily suspended their legal advocacy operations effective October 31, 2016, due to funding shortages. Citizen Power further explained that the OCA actively participated in this proceeding and had addressed the issues on which Citizen Power was concerned. As such, Citizen Power requested that the Commission grant its Petition to Withdraw.

Exceptions to the Initial Decision were filed by Duquesne and the OCA on November 28, 2016. Replies to Exceptions were received on December 8, 2016, from Duquesne and the OCA.

IV. Discussion

We note that any issue that we do not specifically address has been duly considered and will be denied without further discussion. It is well settled that the Commission is not required to consider, expressly or at length, each contention or argument raised by the parties. *Consolidated Rail Corporation v. Pa. PUC*, 625 A.2d 741 (Pa. Cmwlth. 1993); *see also, generally, University of Pennsylvania v. Pa. PUC*, 485 A.2d 1217 (Pa. Cmwlth. 1984).

A. Legal Standards

As the proponent of a rule or order, the Company has the burden of proof in this proceeding in accordance with Section 332(a) of the Public Utility Code (Code), 66 Pa. C.S. § 332(a). Courts have held that “[a] litigant’s burden of proof before administrative tribunals as well as before most civil proceedings is satisfied by establishing a preponderance of evidence which is substantial and legally credible.” *Samuel J. Lansberry, Inc. v. Pa. PUC*, 578 A.2d 600 (Pa. Cmwlth. 1990), *alloc. denied*, 529 Pa. 654, 602 A.2d 863 (1992). That is, the Company’s evidence must be more convincing, by even the smallest amount, than that presented by the other Parties. *Se-Ling Hosiery, Inc. v. Margulies*, 364 Pa. 45, 70 A.2d 854 (1950). Additionally, this Commission’s decision must be supported by substantial evidence in the record. More is required than a mere trace of evidence or a suspicion of the existence of a fact sought to be established. *Norfolk & Western Ry. Co. v. Pa. PUC*, 489 Pa. 109, 413 A.2d 1037 (1980).

B. Duquesne’s Petition

In its Petition to modify its SMP, Duquesne proposed to install an ADMS to achieve enhanced communication, outage restoration and voltage monitoring

capabilities, and to recover Bill Ready costs through the Company's SMC. The Company stated that it had conducted a study of the costs and benefits of implementing enhanced outage communications and voltage monitoring capabilities and that based on the results of the study, it is proposing the implementation in its Petition. Duquesne explained that it had issued a Request for Proposal (RFP) to conduct a comprehensive study of these costs and benefits and chose DNV GL as the vendor to complete the requested study. Petition at 1-11.

Duquesne explained that the proposed 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. According to Duquesne, implementation of ADMS will be 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. Duquesne asserted that the system is also expected to reduce manual outage analysis, response times and customer outage duration. Further, Duquesne maintained that ADMS provides enhanced load balancing, fault location isolation, service restoration, interactive Volt/VAR optimization and voltage regulation and conservation. Petition at 11.

Next, Duquesne explained that it must implement certain foundational systems to achieve the proposed functionality. First, the Company stated that it must develop an electrical model which 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. Additionally, Duquesne claimed that it must replace its current Outage Analysis System

(OAS)² with an Outage Management System (OMS). Duquesne explained that 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. Petition at 12. Finally, Duquesne proposed to accelerate its smart deployment schedule by one year so that its residential meters will be fully deployed by the end of 2018 and commercial and industrial meters by the end of 2019.

Duquesne projected that these changes will increase the overall cost of its original SMP from \$203 million to \$319 million. The Company stated that \$54 million of this projected increase will be for the completion of smart meters and supporting technology, and \$7 million is needed to implement Bill Ready billing. The \$55 million balance of the increase represents the projected cost of the ADMS project. Petition at 16-17.

C. Positions of the Parties

Duquesne requests that its modified SMP be approved because (1) the customers' savings were reliably quantified when Duquesne provided detailed distribution system data to DNV GL, and DNV GL used this Company-specific information to calculate customer savings on a circuit by circuit basis;³ (2) the estimate of customer savings calculated by DNV GL is supported by a second model – the Interruption Cost Estimate (ICE) calculator – and based upon these two independent models, implementing the ADMS will provide substantial customer savings that have been reliably quantified; (3) the savings should not be ignored simply because the DNV GL model uses a proprietary calculation and it would have been unfair to force DNV GL to release the details of the proprietary model because it would give their competitors the

² The OAS 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.

³ Duquesne St. No. 2-R at 6.

ability to duplicate the model; (4) Duquesne provided considerable detail to the OCA regarding what factors DNV GL considered in estimating customer benefits in order to address their concerns about the proprietary DNV GL model;⁴ and (5) Duquesne supported its level of estimated savings through the publicly available ICE calculator and provided all of the data inputs that were used for the ICE calculator as an exhibit to its testimony.⁵

The OCA asserted that Duquesne failed to meet its burden of proving the ADMS project as proposed is cost-effective. The OCA pointed out that the Commission, in its *Implementation Order*, reserved the right to waive the requirement for any of the nine additional smart meter capabilities it imposed if that capability was shown to be cost-ineffective. The OCA maintained that in this proceeding, the ADMS project (proposed as a means of meeting two of the nine additional capabilities) has been shown to be demonstrably cost-ineffective and the Commission should reject the project. According to the OCA, unless Duquesne can return with a cost-effective alternative proposal for implementing the outage communication and voltage monitoring capabilities, the Commission should waive these requirements for Duquesne under the Smart Meter requirements. However, the OCA recommended that should the Commission not reject the ADMS project, the recovery of the project's costs should be sought through a base rate case and not Duquesne's SMC. Also, the OCA submitted that the costs of Bill Ready functionality are properly recovered from Electric Generation Suppliers (EGSs) who are the overwhelming beneficiaries of this capability.

Citizen Power agreed with the OCA that Duquesne failed to demonstrate that its ADMS project is cost-effective. Citizen Power urges the Commission to reject that aspect of the Petition. In the alternative, Citizen Power recommended that if the

⁴ Duquesne Exhibit JK 1-R.

⁵ Duquesne Exhibit JK 2-R.

Commission does determine that the ADMS is cost-effective, Duquesne should be required to recover the associated costs through base rates.

D. ADMS Project Approval Issue

1. Positions of the Parties

Duquesne asserted that the Commission directed EDCs to adopt enhanced abilities to communicate outages and restorations, and to monitor voltage as part of the Smart Meter program. According to Duquesne, in its *Implementation Order*, the Commission required EDCs to evaluate the cost effectiveness of these capabilities. Duquesne noted that the Commission thought these capabilities would further facilitate the consumer's ability to control their electric use and costs, but reserved the authority to waive these requirements if they were not cost effective. Duquesne M.B. at 9-11, 18-19 (citing *Implementation Order* at 17, 31).

Duquesne opined that the OMS will create substantial benefits for customers and for the Company. Duquesne asserted that the OMS is expected to produce savings of approximately \$300,000 per year due to reduced phone calls at the Company's call center and increased effectiveness during and after storm events. Also, Duquesne submitted that based upon the DNV GL societal benefits, the OMS is estimated to create customer savings of approximately \$6 million per year due to a reduction in outage time. Duquesne stated that there are also numerous other safety and other non-quantifiable benefits associated with implementing the OMS. Duquesne M.B. at 12.

Duquesne noted that the ICE calculator, which is a publicly available model that was developed for the U.S. Department of Energy to calculate societal or customer cost savings of reduced outage time, determined that the range of annual customer savings in 2013 was \$4 million but would increase to approximately \$6 million by 2039.

However, Duquesne recommends using the DNV GL study because the customer benefits are calculated based upon more specific information about the Company's distribution system. Duquesne M.B. at 15.

Next, Duquesne submitted that the DMS component of the ADMS enhances the Company's voltage monitoring functions and will provide significant benefits. Duquesne estimated that 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 is fully implemented and utilized. Duquesne explained that the capacity demand reduction will be passed on to customers through reduced power costs. Duquesne also submitted that 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. Duquesne M.B. at 12.

Duquesne estimated that the OMS is expected to cost approximately \$42 to \$51 million, and it is expected that benefits will exceed costs in approximately seven to nine years. Additionally, Duquesne estimated that the DMS is expected to cost approximately \$3.8 to \$4.4 million, and it is expected that benefits will exceed costs in less than two years. Therefore, the total projected cost of the ADMS project is estimated by the Company to be between \$46 to \$56 million. Duquesne asserts that the ADMS system is cost effective and should be approved. Duquesne M.B. at 22.

The OCA recounted that the Commission's *Implementation Order* at 30 directed that an EDC's smart meter technology should support nine functions in addition to those mandated by Act 129. The OCA stated that due to its concern that some smart meter technological functions or capabilities might not be cost-effective, the Commission directed that each SMP filing include cost data that quantifies the costs to meet the minimum requirements set forth in Act 129, as well as the individual incremental costs of each added function, less any operating and capital cost savings. The OCA noted that the

Commission further stated that if an EDC or other party demonstrates that a Commission-imposed smart meter function is shown not to be cost-effective, the Commission would retain the option of waiving that particular requirement for the affected EDC. OCA M.B. at 8 (citing *Implementation Order* at 31).

Accordingly, it is the OCA's view that the ADMS project is not cost-effective and should not move forward as a smart meter project. The OCA asserted that as a cost-ineffective project, the Commission should waive the requirement for these functionalities for Duquesne. The OCA stated that in evaluating the costs and benefits of the ADMS project, the Company combined the estimated costs of the OMS (\$42.2 - \$51.6 million) with those of the DMS (\$3.8 - \$4.4 million) to reach a total of \$46 - \$56 million. The OCA pointed out that Duquesne also stated that the Company would incur ongoing operating costs of \$5 to \$6 million during the implementation phase of the project. Next, the OCA explained that over the projected twenty-year life of the ADMS system, Duquesne expected the benefits to total \$46.3 million (\$300,000 x 20 years of OMS benefits plus \$2.285 million x 20 years of DMS benefits). According to the OCA, the amount of expected benefits exceeds the lower end of the total cost estimate by only \$300,000, and only if the \$5 to \$6 million of ongoing operating costs associated with the implementation phase are not considered. OCA M.B. at 9-10.

The OCA identified three issues with regard to Duquesne's cost/benefit analysis: (1) whether the benefits (other than societal) would actually exceed the ADMS' costs prior to the end of the project life; (2) how certain ongoing Operating and Maintenance (O&M) costs were not included but should have been included in Duquesne's analysis; and (3) the \$6 million in alleged annual societal benefits are too uncertain to be utilized as part of the cost-benefit analysis. OCA M.B. at 11.

Regarding the first issue, the OCA questioned whether the ADMS project would be completed at the low end of its projected cost range which would allow projected benefits to exceed the projected costs. The OCA pointed to a statement in Duquesne witness Karcher's Direct Testimony noting that the estimate for OMS was given in a range due to uncertainty about the cost at the current stage of development and that greater accuracy will not be achieved until the project is competitively bid. OCA M.B. at 11.

Secondly, the OCA is concerned because Duquesne did not include the ongoing project O&M costs as part of the cost-benefit analysis. Instead, the OCA claimed that Duquesne compared implementation costs only, not ongoing costs, to benefits. The OCA argued that the *Implementation Order* required Duquesne to include deployment and operating costs including "a breakdown of all incremental and any associated potential operational and maintenance cost savings for each functionality and configuration. The cost-benefit analysis should reflect the incremental ongoing O&M costs that will be incurred during the period in which benefits are derived; otherwise, the cost-benefit analysis is not accounting for the required incremental costs to achieve those benefits and does not follow the requirements of the *Implementation Order*." OCA M.B. at 11-12 (quoting OCA St. No. 1 at 12) (internal quotations omitted).

The OCA asserted that the cost for the ADMS project rises from Duquesne's initial estimate of \$46 million to \$56 million up to nearly \$125 million over the project's life, when the ongoing O&M costs are included in the analysis. Comparing this estimated cost to the projected non-societal benefits of \$46.3 million, the OCA asserted that the cost of the project substantially outstrips the objective benefits Duquesne has identified. The OCA further noted that according to its analysis, even if the \$6 million of societal benefits are utilized in the evaluation, benefits will not exceed costs until the year 2034. OCA M.B. at 13.

Concerning the third issue, the OCA questioned whether the societal benefits should be relied upon at all to justify the ADMS project costs based on the theory that societal benefits should not be used in a cost-benefit analysis if those benefits cannot be quantified reliably. The OCA opined that determinations of cost-effectiveness should be based on quantifiable operational improvements as the savings produced by these improvements offset costs that are included within rates. The OCA asserted that the \$2.285 million in annual savings related to the OMS and the \$300,000 in annual savings related to the DMS reflect reductions in costs that will flow to the customer either directly or indirectly through the rates they pay the Company. However, the OCA claimed that the same cannot be said for the societal benefits estimated by the Company as these savings exist outside of the ratemaking function. The OCA averred that as non-system benefits, these cost savings should not be included as part of the cost-effectiveness evaluation utilized by the Commission. OCA M.B. at 13-14.

Citizen Power argued that an analysis of the benefits and costs provided by Duquesne does not demonstrate that the ADMS Project is cost effective. First, Citizen Power stated that the Commission did not specify what type of cost/benefit analysis should be performed and that there are many instances where the Commission does not take societal benefits into account when looking at the cost-effectiveness of a proposal. Also, Citizen Power opined that even taking societal benefits into account, the cost effectiveness is unclear as the combined cost of the ADMS project and the ADMS Run Operations could be as high as \$62 million, while the quantifiable benefits, many of which are far into the future, are only estimated at \$46.3 million. According to Citizen Power, it is uncertain whether a conservative estimate of \$4 million per year in societal benefits exceeds the estimated ongoing costs of \$2.8 million per year of operating and maintaining ADMS by a large enough margin to justify the cost. Citizen Power M.B. at 7-8.

2. ALJ's Decision

The ALJ concluded that the ADMS project was not cost effective. The ALJ stated that the OCA was correct that when determining cost effectiveness and making a cost-benefit analysis that extends over a period of many years, Duquesne should have included ongoing project O&M costs, in addition to the costs to upgrade current equipment, upgrade the new equipment, and deal with routine obsolescence. According to the ALJ, when all costs are added up, it becomes obvious that the functionalities are not cost effective. The ALJ stated that the cost to create the electric model, implement the ADMS, including the OMS and DMS, and cover incremental O&M costs through 2039 will total over \$78 million, not \$56 million as averred by Duquesne. Thus, the ALJ concluded that these costs exceed the benefits to be enjoyed by the Company and the consumers over the useful life of the functionality. I.D. at 43.

Additionally, the ALJ found persuasive the OCA's argument that the estimated soft benefits should not be included within the cost benefit analysis because including soft benefits is not an industry-wide standard. The ALJ stated that without the soft benefits included, the proposed costs would not accrue a benefit until after the hardware and software life expectancies have expired. The ALJ further asserted that even if the soft benefits were included in the cost benefit analysis, the estimate of soft benefits provided by DNV GL was too tenuous and obscure because Duquesne failed to explain why it could not reveal the factors and materials used by DNV GL in the creation of its estimate. The ALJ noted that Duquesne could have provided this information under the terms of the Protective Order that had been issued earlier but it chose not to divulge the supporting confidential information. Thus, the ALJ concluded that "without knowing what DNV GL looked at, considered and weighed, its final estimation is without foundation or weight." I.D. at 43.

The ALJ noted that contrary to Duquesne's contentions, the Commission's *Implementation Order* only required EDCs to analyze the cost effectiveness of OMS and DMS functionalities, but did not require that they implement these functionalities. In addition, the ALJ pointed out that the *Implementation Order* does not require that cost recovery for the OMS and DMS functionalities be incorporated into the SMC, but rather, the EDC may choose to incorporate it into the SMC. I.D. at 41.

The ALJ reiterated that by including both the hard and soft benefits in the cost benefit analysis, Duquesne's plan to implement the ADMS will not become cost effective until at least 2034. However, the ALJ stated that when excluding the soft benefits, the ADMS will never become cost effective prior to its obsolescence, as evidenced by the fact that by 2039 the cumulative benefits will be \$46 million while the cumulative costs will total \$125 million, not including the O&M costs. I.D. at 42 (citing OCA Exhibit SLS-3).

With regard to Duquesne's use of ICE, the ALJ noted that while ICE is an industry-acceptable standard, its calculation of \$4 million carries limited weight because it is based on old data and data collected outside of the Mid-Atlantic region. However, the ALJ was of the opinion that using the estimate from the ICE calculator is better than no estimate. Therefore, she concluded that if soft benefits are considered in the cost-benefit analysis, the lower ICE calculator should be used. I.D. at 42-44.

In conclusion, the ALJ determined that soft benefits should not be included when making the cost-benefit analysis for the changes to the smart meter charge. She noted that those soft benefits, as they occur, will not be lost as a benefit for the customers. According to the ALJ, those benefits eventually will be captured and incorporated into the customers' bills as a lower charge in the next base rate case, just as other EDCs in Pennsylvania have done. The ALJ opined that Duquesne can quantify and validate the

savings in the context of a rate base proceeding “instead of estimating them based on tenuous calculations shrouded in mystery and uncertainty.” I.D. at 44.

3. Exceptions and Replies

In its Exceptions, Duquesne asserts that the ALJ erred in concluding that the proposed ADMS project was not cost-effective. Duquesne maintains that its proposed ADMS project will provide substantial and significant tangible benefits for customers. First, Duquesne submits that the OMS will allow the Company to fully utilize the newly installed smart meters for outage restoration and communication. Duquesne states that the Company will be aware of outages and locations of outages sooner with the OMS and will be able to dispatch outage restoration crews earlier and prioritize crews to larger outages, which will reduce outage time. Duquesne estimates that the average duration of outages will decrease by five minutes with the OMS, which produces significant savings for customers. Duquesne avers that no Party in this proceeding disputed this Company estimate. Duquesne Exc. at 4-7.

Next, Duquesne explains that it presented the results of two independent studies as evidence of estimated customer savings. According to Duquesne, its consultant, DNV GL, performed a comprehensive study of the Company’s distribution system to estimate savings that will be achieved by a reduction in average outage time of five minutes. Duquesne asserts that the study evaluated Company specific data and estimated cost savings to customers of approximately \$6 million per year from reduced outage time. Duquesne states that it also presented results from a separate model, the ICE calculator, which was developed for the U.S. Department of Energy to estimate cost savings for customers due to reduced outage time. Duquesne explains that the ICE calculator is designed to estimate interruption costs and benefits associated with reliability improvements in the U.S. Duquesne states that the range of annual customer savings estimated by the ICE calculator is approximately \$4 million in 2023 increasing to

approximately \$6 million in the year 2039. However, Duquesne recommends using the DNV GL study because the customer benefits are calculated based upon more specific information about the Company's distribution system. Duquesne opines that it is clear based upon these two independent models that there will be substantial customer savings from implementing the OMS component of ADMS. Duquesne Exc. at 7-8.

In response to the ALJ's recommendation that the DNV GL results cannot be relied on because its formulas are proprietary, Duquesne states that this does not mean that the savings should be ignored. Duquesne opines that if DNV GL were to release the details of the model, their competitors would be able to duplicate the model. As such, Duquesne avers that DNV GL was not willing to release its formulas. Duquesne explains that to address these concerns it provided considerable detail to the Parties regarding what factors DNV GL considered in estimating benefits and further supported its level of estimated savings through the publicly available ICE calculator. Duquesne claims that the ICE model results conclusively demonstrate the reasonableness of the DNV GL results. Duquesne Exc. at 8-9.

In response to the ALJ's criticism of the ICE model, that it was outdated and did not rely on Duquesne specific data, the Company avers that this is no basis to reject this model. Duquesne posits that it presented the ICE model as support for the DNV GL estimates and maintains that the results from both models provide substantial evidence that customers will experience significant savings from implementing the OMS. Duquesne submits that it is undisputed that customers will experience benefits with reduced outage time and that neither the OCA nor any other Party in this proceeding presented any independent analysis of benefits customers will experience from the ADMS. Duquesne maintains that the DNV GL results combined with the ICE model results provide substantial evidence that customers will experience savings of approximately \$6 million per year. Also, Duquesne states that it presented evidence that it will achieve an additional estimated savings of \$300,000 per year due to increased

efficiencies during and after storm events and due to reduced call volume at its call center. Duquesne Exc. at 9-10.

Furthermore, Duquesne submits that it also provided a list of non-quantifiable benefits from the OMS which could result in savings, but were not included in the cost-benefit analysis. Duquesne states that no Party in this proceeding disputed that the OMS would provide these benefits, but the ALJ failed to consider them. Duquesne disagrees with the ALJ's conclusion that it failed to demonstrate that these non-quantifiable benefits are significant. Duquesne opines that the significance of the non-quantifiable benefits is self-evident and does not require further explanation. The Company explains that it did not attempt to quantify these benefits because they are difficult to accurately quantify. However, Duquesne opines that it is appropriate for the Commission to consider these many benefits in determining whether to approve the OMS project. Duquesne Exc. at 10-13 (citing Duquesne Exh. JK 3-R).

Next, Duquesne avers that the DMS component of the proposed ADMS project will also provide significant benefits for customers. First, Duquesne states that the Volt/VAR functionality of the DMS is expected to achieve an electric system benefit of \$2 million per year in capacity demand reduction, which will result in reduced power costs for customers. Second, Duquesne points out that the transformer loading functionality of the DMS is expected to reduce costs by approximately \$285,000 per year due to Asset Management and overtime savings. In addition, Duquesne asserts that the DMS will enhance fault location, which will reduce the time needed to find damage to the distribution system when the trouble location is otherwise unknown. Duquesne Exc. at 13.

Duquesne also contends that the ALJ erred in excluding consideration of soft or customer benefits as estimated by both the DNV GL study and the ICE Model from the cost-benefit analysis. Duquesne explains that soft benefits are benefits

experienced by customers that are not part of utility rates, *i.e.*, customer savings for increased production time or food spoilage from reduced outages. Duquesne points out that the ALJ recognized that if these soft benefits are included in the cost-benefit analysis, the proposed ADMS project would be cost effective. Duquesne asserts that there is no dispute in this proceeding that customers will experience benefits from the ADMS project due to reduced outage time. Duquesne maintains that the ALJ's conclusion that it is not industry standard to include customer benefits in evaluating the cost-effectiveness of a smart meter program is unsubstantiated and is based upon statements made by the OCA with respect to energy efficiency and conservation (EE&C) programs, not with implementing smart meter programs. Duquesne claims that it is appropriate to exclude customer benefits from evaluating the cost-effectiveness of EE&C programs because the statute limits the evaluation to costs associated with supplying energy.⁶ According to Duquesne, there is no such statutory prohibition for considering customer benefits for smart meter functionalities. Duquesne Exc. at 13-14.

Finally, Duquesne claims that the Commission's *Implementation Order* takes a broad view of smart meter functionalities and requires EDCs to include these functionalities in their smart meter plans. Duquesne notes that the Commission reserved the authority "to waive" the additional smart meter functionalities if they were not cost-effective. Duquesne further notes that the Commission, on page 31 of the *Implementation Order*, also stated that it had the option to waive a requirement if it is not cost-effective. Based upon this language from the *Implementation Order*, Duquesne opines that the Commission desires that EDCs implement all of the smart meter functionalities identified therein. Therefore, Duquesne posits that the Commission should take a broader view of cost savings in discerning whether smart meter functionalities are cost-effective as opposed to the factors that the Commission considers

⁶ Duquesne Exc. at 14 (citing *Energy Efficiency and Conservation Program Implementation Order*, Docket No. M-2008-2069887 (Order entered January 16, 2009) (*EE&C Order*) at 15-16).

when approving an EE&C program. Duquesne cites to the *Joint Petition of Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company and West Penn Power Company for Approval of Their Smart Meter Deployment Plan*, Docket No. M-2013-2341990, *et al.* (Order entered June 25, 2014) at 16, where the Commission considered the potential for additional operating savings in approving the FirstEnergy Companies' accelerated smart meter deployment plan. Duquesne Exc. at 15-16.

In its Replies to Exceptions, the OCA states that the ALJ correctly determined that the proposed ADMS project was not cost-effective. The OCA states that the cost of the ADMS will range from \$46 to \$56 million, plus ongoing O&M costs of \$5 to \$6 million during the implementation phase of the project, through the year 2020. The OCA provides that the Company estimated that the ADMS will produce \$46.3 million in what the OCA terms "hard" benefits, that is, projected cost savings directly tied to Duquesne's electrical system. In addition, the OCA asserts that the Company estimated that the OMS will yield \$6 million of annual "societal" benefits to customers as a result of an expected reduction of five minutes in the average duration of power outages. The OCA also points out that the Company identified other non-quantifiable benefits it expects will result from implementing the ADMS. OCA R. Exc. at 3-4 (citing Duquesne St. No. 2 at 7, 15-16).

The OCA opines that if focusing on just the hard benefits and comparing them with the cost of the project (the \$46 to \$56 million, plus the \$5 to \$6 million in implementation phase operating costs), it is apparent that costs will exceed benefits. Furthermore, the OCA maintains that Duquesne did not include in its cost-benefit analysis the ongoing incremental O&M costs that it will incur throughout the life of the ADMS project beyond the implementation phase through 2039. According to the OCA, these costs range from \$3.203 million in 2021 to \$4.582 million in 2039. The OCA provides that the total O&M costs for the life of the project equals \$78.455 million. The OCA cited the following rationale for including these costs in the cost-benefit analysis:

The *Implementation Order* [at 30] requires that “the deployment and operating costs to be presented shall include a breakdown of all incremental and any associated potential operational and maintenance cost savings for each functionality and configuration.” The cost-benefit analysis should reflect the incremental ongoing O&M costs that will be incurred during the period in which benefits are derived; otherwise, the cost-benefit analysis is not accounting for the required incremental costs to achieve those benefits and does not follow the requirements of the *Implementation Order*. The Company is projecting that the ADMS will generate enough benefits to surpass costs by the conclusion of 2039; however, this comparison excludes costs that will be incurred through 2039, but are beyond the implementation period.

OCA R. Exc. at 4-5 (quoting OCA St. No. 1 at 12).

The OCA explains that when one adds the \$46 to \$56 million identified by Duquesne as the installed cost of ADMS to the \$78.455 million in incremental O&M costs, the total costs of the project of between \$124.5 and \$134.5 million dwarfs the projected hard benefits of \$46.3 million. The OCA maintains that if the ADMS can be found to be cost beneficial at all, it can only be done through inclusion of the claimed \$6 million of annual “societal” benefits in the analysis and ignoring the incremental O&M costs. The OCA argues that these societal benefits should not be considered in the cost-benefit analysis and does not believe that they could be reliably quantified. Moreover, the OCA opines that these benefits do not offset costs that are included in customers’ rates and they are not benefits realized by all customers. OCA R. Exc. at 5-6.

Next, the OCA asserts that in order for benefits to be included in a cost-benefit analysis, they should be based on quantifiable operational improvements that offset costs that are incorporated in the rates customers pay. The OCA points out that this is true of the hard benefits that Duquesne cites for both the OMS and DMS as the

\$2.285 million in annual savings related to the OMS and the \$300,000 in annual savings related to the DMS reflect reductions in costs that will flow to the customer either directly or indirectly through rates. However, the OCA avers that this is not true for the societal benefits the Company cites as these savings exist outside of the ratemaking function. According to the OCA, costs related to lost production time, food spoilage, hotel stays are not things that all customers pay for in their rates. As non-system benefits, the OCA states that these cost savings should not be included as part of the cost-effectiveness evaluation conducted by Duquesne or by the Commission. OCA R. Exc. at 6-7.

Next, the OCA submits that the estimated societal benefits of the DNV GL and ICE models presented by the Company are ultimately too speculative to warrant inclusion in a rigorous cost-benefit analysis of the ADMS project. The OCA points out that even Duquesne's own study recognized that the \$6 million of societal benefits as being "soft" and difficult to quantify. Also, the OCA reiterates that the \$6 million of societal benefits was the result of DNV GL's use of proprietary formulas to calculate the benefit figure. The OCA noted that the Commission has traditionally not recognized claims of societal benefits in other contexts, such as the analysis of the cost-effectiveness of EE&C Programs. OCA R. Exc. at 9 (citing *EE&C Order*). According to the OCA, without inclusion of these benefits in the evaluation, ADMS cannot possibly be found to be cost-effective. Therefore, the OCA states that in the absence of a cost-effective proposal, the Commission should exercise its authority to waive the "additional" capabilities of outage and restoration communication and voltage monitoring for Duquesne. OCA R. Exc. at 7-9.

Finally, in response to the assertions made in Duquesne's Exceptions that the OCA failed to meet its burden of presenting contrary evidence by not offering an independent analysis of societal benefits, the OCA submits that it is under no such burden in this proceeding. The OCA asserts that as the proponent of a Commission order in this

case, the burden of proof rests and remains on the Company to show that the ADMS is cost-effective. OCA R. Exc. at 9-10 (citing 66 Pa. C.S. § 332(a)). The OCA states that the only burden on it is to come forward with evidence to rebut the assertion that “societal benefits” are hard benefits worthy of inclusion in a cost-benefit analysis. The OCA posits that it is under no obligation to produce its own independent analysis of potential societal benefits. The OCA submits that it has met its burden of going forward with the evidence. OCA R. Exc. at 9-10.

4. Disposition

Upon our review of the evidence of record, we shall adopt ALJ Dunderdale’s well-reasoned conclusion that the Duquesne-proposed ADMS project is not cost effective as submitted in this proceeding. We conclude that Duquesne has failed to meet its burden of proving that this project is in the public interest at this time. In reaching this determination, we are in agreement with the position of the ALJ that the projected soft benefits identified by Duquesne are speculative and should not be included within the cost-benefit analysis of the ADMS project. Furthermore, we are also in agreement with the ALJ that the ongoing, projected O&M costs as identified by the OCA should have been included within any cost-benefit analysis of this project.

It is important to note that in our *Implementation Order*, the Commission did not require EDCs to implement the functionalities which Duquesne’s OMS and DMS are designed to accomplish, only to analyze their cost effectiveness. We specifically stated in our *Implementation Order* that while we believed that the smart meter capabilities we delineated will further facilitate the consumer’s ability to control their electric use and costs, we were aware that the costs of some of the added capabilities may exceed any benefit they may provide. As such, we reserved the authority to waive the requirement for any of the Commission imposed requirements to the extent that an EDC or another party demonstrates that a particular requirement is not cost effective.

Therefore, based upon the record within this proceeding and our conclusion that Duquesne failed to demonstrate that its proposed ADMS project is cost effective, at this time we shall waive the additional Commission-imposed capabilities of outage and restoration communication and voltage monitoring for Duquesne. However, Duquesne is not precluded from future development of these smart meter related capabilities, and seeking cost recovery in a base rate case, after demonstrating that such investments are prudent, as more fully discussed below.

Accordingly, we shall deny the Exceptions filed by Duquesne on this issue and adopt the ALJ's determination that the ADMS project proposed by Duquesne is not cost effective.

E. ADMS Cost Recovery

1. Positions of the Parties

Duquesne argued that the Commission should permit it to recover ADMS costs through its SMC because this project will enable the Company to meet the smart meter technology requirements set forth in the Commission's *Implementation Order* of communicating outages and restorations and monitoring voltage. Duquesne asserted that Act 129 gives the Company the discretion to determine how to recover these smart meter costs and explained that it has elected to recover smart meter costs on a full and current basis through its SMC, which is a reconcilable automatic adjustment clause under Section 1307 of the Code, a practice the Commission expressly authorized. Duquesne stated that it does not have this new technology at the moment and asserted that it should be permitted to implement this technology as other EDCs in Pennsylvania already have it. According to Duquesne, the Commission, in its *Implementation Order* at 9, noted that each EDC had different capabilities and implementation challenges. As such, Duquesne

argued that it should not be penalized for having to install a new ADMS system to meet the *Implementation Order* requirements. Duquesne M.B. at 22-24.

The OCA first noted that Duquesne does not require Commission approval to upgrade its outage management system just as it did not require prior Commission approval to upgrade its Customer Care and Billing System. According to the OCA, these types of systems are part of a utility's normal business operations and upgrading or replacing them is something that occurs in the regular course of doing business, particularly in the face of technological advancements. That said, however, the OCA further asserted that Duquesne would need to meet the statutory requirements for recovery through the SMC, a special recovery mechanism established as part of Act 129, if the Company seeks to recover the costs of the upgrade through that charge. The OCA opined that Duquesne has not met this burden. OCA M.B. at 17-18.

Next, the OCA claimed that the record evidence revealed that some portion, perhaps a large portion, of ADMS costs are unrelated to the costs of establishing the voltage monitoring and outage communication capabilities recommended by the Commission in its *Implementation Order*. The OCA further asserted that the ADMS is a cost-ineffective means of achieving these additional functionalities.⁷ According to the OCA, these ADMS costs are costs incurred in the normal course of business to provide safe, adequate and reliable service. OCA M.B. at 21 (citing Tr. at 144-148).

The OCA argued that Duquesne is attempting to bootstrap normal operating investment and expenses incurred in the ordinary course of business and recovered through base rates into smart meter costs recoverable through a special mechanism that accelerates recovery and limits opportunity to explore issues of reasonableness and

⁷ OCA argues that Duquesne did not provide a breakdown of ADMS costs that are smart meter-related and those that are not. As indicated in response to the first ALJ question in the Post-Hearing Order, the Company asserted all of the costs of ADMS are smart-meter related. Duquesne St. No. 2C at 5; Tr. at 91-92.

prudence. According to the OCA, it is mere fortuity that the SMC is available at the time Duquesne proposed to make these needed upgrades to its systems. OCA M.B. at 21.

Next, the OCA cited to Section 2807(f)(7) of the Code which addresses the recovery of costs of providing smart meter technology. The OCA noted that the definition of “smart meter technology” is provided within Section 2807(g) which states, in part:

. . . 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.

66 Pa. C.S. § 2807(g).

The OCA explained that under this definition, only the costs of distribution system upgrades that enable metering and network communication technology can be recovered through the SMC. The OCA opined that the ADMS is not needed to enable the smart meters as they are capable of working with the existing OAS. Rather, the OCA maintained that this upgrade is a cost of doing business, that is, a cost an EDC must incur to provide safe, reliable and adequate service. OCA M.B. at 22.

The OCA argued the ADMS should not be recovered through the SMC and that if Duquesne goes forward with this project, it should instead seek recovery in a base rate proceeding, because the Company already receives revenues in base rates to pay for outage and distribution management. According to the OCA, any costs associated with the upgrades to these systems should remain in base rates because this is the standard practice for recovering these types of costs. The OCA explained that through base rates, operating efficiencies and associated cost reductions that accrue as a result of the

investment in the ADMS will eventually flow back to customers. The OCA pointed out that, at this time, soft benefits cannot be quantified nor is the longevity of the soft benefits quantifiable at this time. However, the OCA posited that recovering the costs of the ADMS project as part of the base rates will allow for the forecasted soft benefits to be captured through base rates, over the same time period that the costs of the project are being collected through base rates. OCA M.B. at 22-23.

Citizen Power questioned the cost recovery of the proposed ADMS Project through the SMC, which allocates common costs on a per meter basis as opposed to recovering ADMS costs in base rates. Citizen Power claimed that there exists a requirement that “all measures associated with an EDC’s smart metering plan shall be financed by the customer class that receives the benefit of such measures.” Citizen Power M.B. at 9 (quoting *Implementation Order* at 32). Citizen Power submitted that if a customer class receives a negligible amount of benefits from a measure, it should not be required to contribute toward the financing of such measure. Citizen Power opined that the benefits from the reduced call volume and storm efficiency accrue directly to Duquesne and therefore the associated costs are not recoverable. Citizen Power asserted that in this case, using base rates would be much more appropriate from the standpoint that rates should be prudent and reasonable. According to Citizen Power, Duquesne’s proposed method of cost recovery would allocate approximately ninety percent of the costs to the residential class. However, Citizen Power claimed that based on the estimated value of reliability improvement derived from the ICE calculator, less than two percent of the societal benefits would accrue to the residential class. Citizen Power opined that this extreme divergence between costs and benefits points to the propriety of allocating ADMS costs to base rates. Citizen Power M.B. at 9-10 (citing OCA St. 1-S at 4; and Duquesne Exh. JK 2-R at 2).

2. ALJ's Decision

In her Initial Decision, the ALJ found that Citizen Power's argument was persuasive given the unquantifiable nature of estimating societal or soft benefits. The ALJ found that these soft benefits cannot be used to calculate the cost effectiveness, especially since ninety percent of the costs for OMS and DMS will be borne by residential customers who will only see two percent of the benefits from these new functionalities. The ALJ pointed out that Duquesne admitted it cannot quantify these benefits now. According to the ALJ, soft benefits can be quantified better after the fact and therefore can be better recovered through a base rate proceeding when the reliability and relative costs per customer class are routinely investigated and managed. I.D. at 53.

The ALJ stated that her decision on this issue would be different if the costs of implementing these two functionalities (through the implementation of the ADMS and after creating the electric model) were not so high. However, the ALJ asserted that the Commission's mandate was clear when it ordered Duquesne to determine if the smart meter functionalities were cost effective. The ALJ stated that if cost effective, the Commission wanted Duquesne to add the functionalities and seek cost recovery through the SMC. Unfortunately, the ALJ concluded that the proposed implementation is not cost effective. While the availability of these functionalities could be very useful, the ALJ averred that their implementation, and therefore cost recovery, cannot be made through the SMC due to a failure of the Company to show cost effectiveness. Additionally, the ALJ maintained that the other large EDCs in Pennsylvania have implemented similar versions of the OMS and DMS but sought recovery through their respective base rates. I.D. at 53.

3. Exceptions and Replies

In its Exceptions, Duquesne states that the Commission's *Implementation Order* clearly defined enhanced outage communication, outage restoration and voltage monitoring capabilities as desired smart meter capabilities. Duquesne Exc. at 16 (citing *Implementation Order* at 16). In addition, Duquesne states that the Commission's Order at *Petition of Duquesne Light Company for Approval of Its Final Smart Meter Procurement and Installation Plan*, Docket No. M-2009-2123948 (Order entered May 6, 2013) (*2013 Smart Meter Order*) at 15, required the Company to evaluate whether including enhanced outage communication, outage restoration and voltage monitoring in the Company's Smart Meter Plan was cost effective. Duquesne maintains that it is proposing to implement the ADMS project to enhance its outage communication, outage restoration and voltage monitoring capabilities pursuant to the *Implementation Order* and the Company's *2013 Smart Meter Order*. According to Duquesne, the ALJ's conclusion that the Company should recover ADMS costs in base rates and not through the SMC is contrary to Commission precedent and to Act 129 of 2008. Duquesne Exc. at 16-17.

Next, Duquesne explains that Act 129 provided EDCs the discretion to recover smart meter technology costs through base rates or on a full and current basis through a reconcilable automatic adjustment clause under Section 1307. Duquesne asserts that it has elected to recover such costs on a full and current basis through its SMC, which is a reconcilable automatic adjustment clause under Section 1307. Duquesne further asserts that the Commission has expressly authorized it and all other EDCs in Pennsylvania to recover their smart meter costs through reconcilable automatic adjustment clauses under Section 1307. Duquesne Exc. at 17-18 (citing *Petition of Duquesne Light Company for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123948 (Order entered May 11, 2010) at 14; *Petition of PECO Energy Company for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123944 (Order entered May 6,

2010) at 17-18; *Joint Petition of Metropolitan Edison Company, Pennsylvania Electric Company and Pennsylvania Power Company for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123950 (Order entered June 9, 2010) at 27-28; *Petition of PPL Electric Utilities Corporation for Approval of Smart Meter Technology Procurement and Installation Plan*, Docket No. M-2009-2123945 (Order entered June 24, 2010) at 10-11).

Next, Duquesne states that the ALJ's justification for denying ADMS cost recovery through the SMC on the basis that other EDCs have recovered ADMS costs through base rates is not a valid basis. While Duquesne notes that the OCA claims it is "standard practice" for recovering ADMS costs in base rates, the OCA presented no detail about the level of ADMS costs incurred by other EDCs and to what extent that EDCs recovered ADMS costs in base rates or in their respective smart meter charges. Furthermore, Duquesne notes that the OCA admitted that other EDCs in Pennsylvania have recovered "costs associated with supplemental outage and voltage management upgrades through the SMC." Duquesne Exc. at 19 (quoting OCA St. No. 1-R at 4). Duquesne avers that it must upgrade its outage restoration, outage communication and voltage monitoring capabilities to comply with the Commission's smart meter requirements and as such, should be permitted to recover these system upgrade costs in its SMC. Duquesne Exc. at 19-20.

Duquesne explains that all EDCs in Pennsylvania had implemented different levels of meter functionality at the time that Act 129 was enacted. Duquesne notes that it has an automated meter reading system that was read remotely, that PPL had an automated meter reading system that was able to read meters hourly over the electric lines and that the FirstEnergy EDCs read meters via a meter reading workforce. According to Duquesne, all of these various systems had to be replaced by smart meter technology and the Commission had recognized that each EDC had unique circumstances in its *Implementation Order*. Duquesne maintains that it had implemented an OAS

system before Act 129 was enacted to meet its service requirements for outage restoration and communication. Duquesne opines that its proposal to implement the ADMS project is a direct response to Act 129 and the *Implementation Order* requirements and the Company should be permitted to recover ADMS costs in its SMC. Duquesne Exc. at 20.

Next, Duquesne asserts that the ADMS project is not a normal cost of doing business for the Company as alleged by the OCA. Duquesne explains that its current OAS which it has used for many years to provide service to customers meets the Company's normal and reasonable service requirements under the Code. Installing the ADMS system is a direct response to the Commission's smart meter orders. Also, Duquesne points out that the OCA raised a similar argument in West Penn's smart meter proceeding, arguing that West Penn should not be permitted to recover CIS costs in its SMC because CIS costs are normal operating costs.⁸ However, Duquesne states that the Commission denied this argument finding that the CIS costs are a recoverable cost of compliance with smart meter implementation and are recoverable through West Penn's smart meter surcharge. According to Duquesne, its proposed ADMS project is a smart meter project to comply with the smart meter mandates of Act 129. Duquesne Exc. at 20-22.

In its Replies to Exceptions, the OCA states that the ALJ correctly determined that if Duquesne proceeds with implementation of the ADMS, recovery of the costs of the project should be sought in a base rate proceeding and not obtained through the smart meter charge. First, the OCA submits that ADMS costs do not meet the definition of smart meter technology as provided in Act 129. The OCA states that this Act defines "smart meter technology" under 66 Pa. C.S. § 2807(g). The OCA asserts that ADMS costs are not "smart meter technology" costs under this definition as both the

⁸ Duquesne Exc. at 20-21 (citing *Joint Petition of Metropolitan Edison Company, Pennsylvania Electric Company, Pennsylvania Power Company and West Penn Power Company for Approval of Their Smart Meter Deployment Plan*, Docket Nos. M-2013-2341990, *et al.*, (Order entered March 6, 2014) at 33-34).

OMS and DMS systems utilize the bidirectional communication and data production capabilities of the smart meter technology to better manage Duquesne's distribution system, but they are not necessary to enable the technology. According to the OCA, only the costs of distribution system upgrades that enable metering and network communication technology can be recovered through the SMC. The OCA avers that Duquesne's testimony at the Further Evidentiary Hearing established that the ADMS is not needed to enable the smart meters as they are capable of working with Duquesne's existing outage monitoring system, the OAS. OCA R. Exc. at 10-12 (citing Tr. at 98).

The OCA posits that installation of the OMS and DMS are not exclusively driven by the provisions of the *Implementation Order*, but that they represent upgrades to systems that should occur in the regular course of doing business as a public utility. The OCA points out that a Duquesne witness testified that the OAS is approximately twenty years old and would need to be upgraded at some point. OCA R. Exc. at 13 (citing Tr. at 98). The OCA avers that another Duquesne witness agreed that part of the cost of upgrading to the OMS from OAS and adding DMS is just the cost of doing business as an EDC and part is in addition to that. *Id.* (citing Tr. at 145-146, 148). The OCA maintains that this same witness revealed that Duquesne's impetus for installing the ADMS is being driven not just by the Commission's *Implementation Order*, but by the need simply to upgrade key systems as part of the cost of doing business as a public utility. As such, the OCA submits that the costs of implementing the ADMS are really costs that would be incurred by Duquesne in the ordinary course of business and recovery of these costs should be sought through a base rate proceeding where all issues can be thoroughly examined. OCA R. Exc. at 13-14.

The OCA submits that Duquesne is essentially proposing to bootstrap normal operating investment and expenses incurred in the ordinary course of business and typically recovered through base rates into smart meter costs recoverable through the SMC which allows for accelerated recovery and limits opportunity to explore issues of

reasonableness and prudence. According to the OCA, it is mere fortuity that the SMC is available at the time Duquesne proposes to make needed upgrades to its systems. OCA R. Exc. at 14.

Finally, the OCA posits that because the cost-effectiveness of ADMS can only be established by relying on the difficult to quantify and speculative societal benefits and because these benefits represent such a significant portion of the claimed overall benefits of the project and cannot be reflected as a savings offset in the surcharge, seeking recovery through base rates is appropriate as it would allow for the potential recovery of only those costs found to be reasonable and prudent. OCA further contends that it would better coincide with the period over which the benefits materialize, to the extent that they do, and would ensure that cost recovery from the rate classes and the benefits of the system are properly aligned. The OCA explains that based on the results of Duquesne's application of the ICE calculator there was an imbalance between the cost recovery of ADMS and the expected benefits by rate class because at the conclusion of the ADMS project life, more than half of the benefits would be from "societal" benefits. Also, the OCA explains that according to Duquesne's ICE calculator results, only 1.5 percent of the societal benefits will accrue to the residential class. However, the OCA points out that recovery through the SMC would impose ninety percent of ADMS costs on the residential class. Therefore, the OCA strongly supports the reasoning of the ALJ that points to this disparity as a reason to support base rate recovery for ADMS costs. The OCA opines that questions of cost allocation among rate classes are best and most comprehensively addressed in the context of a base rate case. The OCA submits that front-loading the costs of the ADMS through the SMC in the face of the uncertainty of the benefits from the project, would not meet the just and reasonable standard of ratemaking. OCA R. Exc. at 15.

4. Disposition

Upon our review of the evidence of record, the Exceptions and Replies, thereto, and based upon our prior determination that Duquesne's proposed ADMS project is not cost effective, we shall adopt the determination of the ALJ that the costs of this ADMS project are not recoverable through Duquesne's SMC. We are in agreement with the ALJ's conclusion that the soft benefits estimated by the Company can be quantified better after the fact and therefore can be better recovered through a base rate proceeding when the reliability and relative costs per customer class are routinely investigated and managed. However, based upon the evidence provided in this proceeding, the proposed implementation was not proven to be cost effective and recovery through the SMC would not be reasonable or in the public interest.

Accordingly, we shall deny the Exceptions filed by Duquesne on this issue and adopt the ALJ's decision that denies cost recovery of the proposed ADMS project through Duquesne's existing SMC.

F. Recovery of Bill Ready Costs

1. Positions of the Parties

Duquesne proposed to recover the costs for implementing Bill Ready functionality through its SMC. Duquesne explained that Bill Ready is the billing process whereby an EDC provides the EGS with usage data, receives back the total calculated EGS charges, and places those EGS charges on the joint EDC/EGS bill to the customer. According to Duquesne, Rate Ready is the billing practice whereby the EDC receives the EGS rate and the EDC calculates the EGS charges to be included on the joint EDC/EGS bill to customers. Duquesne contended that the Commission directed EDCs to include the Bill Ready functionality as part of their smart meter plans because of the

Commission's belief that Bill Ready capabilities facilitate time-of-use (TOU) and real-time (RT) pricing. Duquesne M.B. at 28-29 (citing *Smart Meter Procurement and Installation Final Order*, Docket No. M-2009-2092655 (Order entered December 6, 2012) (*Final Implementation Order*) at 10). Duquesne maintained that implementing the Bill Ready functionality is part of its SMP, and the Company should be permitted to recover costs for implementing the Bill Ready functionality through its SMC. Duquesne M.B. at 28-29.

The OCA recommended that the costs to implement Bill Ready billing be recovered from the EGSs and not from Duquesne's customers. The OCA asserted that this position is based on the recognition that EGSs are the principal beneficiaries of this functionality. Citing to OCA St. No. 1 at 18, the OCA explained that presently, Duquesne offers only Rate Ready billing. According to the OCA, being able to provide Bill Ready billing facilitates the ability of EGSs operating in Duquesne's territory to offer a greater range of products to their customers. The OCA opined that a substantial portion of Duquesne's customer base will derive no benefit from the Bill Ready functionality. Furthermore, the OCA argued that Duquesne ignores all of its non-shopping customers when it seeks recovery of these costs from all of its customers, whether shopping in the supply market or not. The OCA also maintained that not all customers who do shop will avail themselves of the special rates offered by the EGSs, because many customers now prefer to remain on fixed rates that do not vary by time of use. According to the OCA, fundamental fairness in ratemaking requires that these costs should be borne by the entities that are the predominant beneficiaries of this capability and that in this proceeding, those predominant beneficiaries are the EGSs. OCA M.B. at 23-24.

2. ALJ's Decision

The ALJ concluded that it is appropriate and reasonable to recover these Bill Ready costs through the SMC as she found that Duquesne is correct that it was not

required to do a cost-benefit analysis. In addition, the ALJ averred that although Bill Ready benefits EGSs, not EDCs, there is some benefit to customers. She explained that with Bill Ready, some suppliers will be able to offer competitive rates that may save customers money. Also, she stated that the Bill Ready functionality will enable the suppliers to implement TOU and other similar rates. According to the ALJ, to the extent Duquesne has customers who are willing to risk having variable rates, this functionality may encourage customers to shop and to reduce consumption. I.D. at 56.

Next, the ALJ explained that Bill Ready is a billing function that is not a smart meter function, *per se*, and in that regard is not related to providing smart meters or smart meter technology to customers. However, she noted that Bill Ready is a functionality that uses smart meter capability and was cited by the Commission in the *Final Implementation Order*. The ALJ stated that the Commission indicated that the costs of the Bill Ready functionality are related to customers who have smart meters, and she found that Duquesne is correct to include this functionality in its modified SMP, especially since no mechanism currently exists for the Company to bill the suppliers. I.D. at 56.

3. Exceptions and Replies

In its Exceptions, the OCA states that the \$7 million cost of implementing Bill Ready billing should not be imposed on customers as Duquesne proposed, but rather should be borne by EGSs, who are the principal beneficiaries of an EDC's implementation of the Bill Ready billing functionality. The OCA explains that Bill Ready billing enables EGSs to take interval data from customers' smart meters and calculate the generation and transmission charges for special pricing programs that they may offer and then forward those charges to the EDC for inclusion on the EDC bill rendered to the customer. The OCA explains that presently Duquesne offers only Rate Ready billing under which EGSs provide their rates to the EDC and the EDC calculates

customer bills using the EGS supplied rate. According to the OCA, it is clear that being able to provide Bill Ready billing will facilitate the ability of EGSs operating in Duquesne's territory to offer a greater range of products to attract more customers. As such, the OCA asserts that EGSs are clearly the principal beneficiaries of this functionality and should bear the costs of its implementation and continuation. OCA Exc. at 1-2.

Next, the OCA points out that the ALJ recognized that Bill Ready is a billing function that is not a smart meter function, *per se*, and in that regard is not related to providing smart meters or smart meter technology to customers. The OCA states that while the Commission required EDCs to include provisions for Bill Ready billing in their SMPs, it does not necessarily follow that the costs of Bill Ready billing should or must be a smart meter cost, recoverable through the SMC. The OCA also points out that the ALJ noted that "[Bill Ready billing] allows EGSs to take advantage of the TOU and RT Pricing programs. Almost the entire benefit of having Bill Ready functionality is a benefit only the EGSs will enjoy although the cost of the function will be borne entirely by customers." OCA Exc. at 3 (quoting I.D. at 56). The OCA asserts that despite making these points, the ALJ finds that the cost of the Bill Ready functionality should be carried entirely by customers through the SMC based on two grounds: (1) that although Bill Ready billing benefits EGSs, not EDCs, there is some benefit to customers; and (2) there is not currently a mechanism by which Duquesne could bill the EGSs. The OCA takes exception on both grounds. OCA Exc. at 3.

Next, the OCA states that while it may be the case that a segment of Duquesne's customers would benefit from the new EGS rates, it is also true that about thirty to forty percent of Duquesne's residential and commercial customers shop for

generation supply.⁹ The OCA points out that not all customers who shop will necessarily avail themselves of the special rates offered by EGSs as a result of Bill Ready billing and may prefer to remain on fixed rates that don't vary by time of use. As such, the OCA claims that it is most likely that a substantial portion of Duquesne's customer base will derive no benefit from the Bill Ready functionality. OCA Exc. at 3-4.

In response to whether there exists a mechanism for billing EGSs for the costs of Bill Ready billing, the OCA states that it is true that none of the charges imposed by Duquesne on EGSs pursuant to its Electric Generation Supplier Coordination Tariff currently provides for such recovery. However, the OCA opines that if the Commission determined that recovering Bill Ready costs from EGSs was more appropriate than seeking it from customers, it could direct the Company either to develop a new charge for that purpose or to modify an existing charge. According to the OCA, one possibility might be to incorporate the costs of Bill Ready billing into the Technical Support and Assistance Charge that is currently imposed by Duquesne on EGSs under its Supplier Tariff. OCA Exc. at 4 (citing Duquesne Light Company Electric Generation Supplier Coordination Tariff at 42).

Finally, the OCA states that Duquesne is coming late to implementing Bill Ready functionality as all the other major EDCs had this capability in place at the time the Commission issued its *Final Implementation Order* in December of 2012. In fact, the OCA avers that some of the EDCs appear to have had Bill Ready billing in place prior to the passage of Act 129 and the imposition of smart meter mandates on the EDCs. According to the OCA, for these EDCs, the costs of Bill Ready billing are recovered through existing rates. The OCA asserts that it is not aware of any other EDC that recovers such costs through their SMC and that Duquesne's insistence to do so is unique

⁹ The OCA references PA OCA Electric Shopping Statistics, October 1, 2016 indicating that 31.6% of Duquesne's residential customers and 42.2% of its commercial customers were shopping as of that date. OCA Exc. at 3.

among the EDCs. Therefore, the OCA submits that Bill Ready costs are not smart meter costs that should be recovered through the SMC. OCA Exc. at 4.

In reply, Duquesne first states that the ALJ's conclusion on this issue is consistent with the *Final Implementation Order* in which the Commission directed EDCs to include Bill Ready functionalities as part of their SMPs. Duquesne notes that the Commission stated within that Order it would be best to promote uniformity and direct that all EDCs subject to the smart meter provisions propose Bill Ready and Dual Billing functionalities as part of their smart meter plans. Duquesne R. Exc. at 1-2 (citing *Final Implementation Order* at 10). Duquesne asserts that the OCA's argument is not logical as the Commission would not have ordered EDCs to include Bill Ready as part of their smart meter plans if it did not anticipate that EDCs could recover these costs, like all other costs associated with smart meter plans, through the SMC. Duquesne asserts that it included Bill Ready functionality as part of its smart meter plan, and therefore is permitted to recover all smart meter plan costs, including Bill Ready costs, through its SMC. Duquesne R. Exc. at 1-2.

Next, Duquesne states that the OCA's position is inconsistent with the Commission's categorization of Bill Ready and smart meter capability as the Commission adopted a broad view of smart meter functionalities in its *Implementation Order*. Duquesne further states that the Commission recognized in its *Final Implementation Order* that Bill Ready facilitates TOU and RT Pricing. Duquesne asserts that because Bill Ready costs are necessary for effectively implementing TOU and RT capabilities, Bill Ready costs should be recovered through the SMC. According to Duquesne, the OCA does not offer any basis to differentiate Bill Ready from other smart meter functionalities for purposes of recovery through the SMC. Duquesne R. Exc. at 3-4.

Next, Duquesne states that Bill Ready capability has the potential to benefit all customers contrary to the OCA's assertions. Duquesne notes that Bill Ready will allow suppliers to offer competitive rates that may save customers money as it facilitates TOU rates which may encourage customers to shop and to reduce consumption. Duquesne opines that these customer benefits provide further support for recovering Bill Ready costs through the SMC. Duquesne further states that the OCA's argument that customers receive no benefit from Bill Ready is without merit because Bill Ready provides customers with the choice to avail themselves of TOU rate offerings at any time. Duquesne opines that whether customers actually decide to shop or elect TOU rates is irrelevant because facilitating shopping provides alternatives to customers. Duquesne asserts that by directing EDCs to include Bill Ready functionalities in their smart meter plans, the Commission clearly viewed the customer benefits of Bill Ready as justifying the associated cost. Duquesne R. Exc. at 4-5.

Duquesne further maintains that there is no reasonable mechanism in place to recover Bill Ready costs from EGSs. Duquesne explains that there are several obstacles to recovering these costs from EGSs as this would be a complex process. Duquesne asserts that EGSs enter and exit the market creating uncertainty for recovery and that some EGSs may not want Bill Ready functionality for product offerings, and therefore, would not be willing to pay for Bill Ready costs. Duquesne avers that for the first time in its Exceptions, the OCA introduces a proposal for recovering Bill Ready costs by incorporating them into the Technical Support and Assistance Charge in the Company's Supplier Tariff. Duquesne requests that the OCA's cursory suggestion must be rejected because it is untimely and not part of the record in this proceeding. According to Duquesne, the OCA did not introduce a single recommendation as to how the Company could recover Bill Ready costs from EGSs and its attempt to introduce one at this late stage of the proceeding is inappropriate. Duquesne maintains that by waiting until the exception stage, the OCA has deprived it of adequate time to evaluate and respond to its proposal. Duquesne R. Exc. at 5-6.

Finally, Duquesne states that the OCA's arguments regarding other EDCs' Bill Ready functionality are unsubstantiated and irrelevant. Duquesne asserts that the OCA's assertions regarding cost recovery by other EDCs should not be considered because they are not part of the record in this proceeding. Duquesne opines that the OCA cannot rely on facts that are not part of the record or attempt to introduce new evidence in support of its position at this stage of the proceeding. Also, Duquesne posits that the OCA failed to mention that, while other EDCs had Bill Ready functionality in place, not all EDCs had Rate Ready in place before Act 129's smart meter deployment requirement. Duquesne cites to PPL Electric Utilities Corporation (PPL), for example, as a utility that did not have Rate Ready in place before it implemented a smart meter plan. Duquesne asserts that following the *Implementation Order*, the Commission directed PPL to implement Rate Ready in addition to Bill Ready. Duquesne R. Exc. at 7 (citing *PPL Electric Utilities Corporation Retail Markets*, Docket No. M-2009-2104271 (Order entered August 11, 2009)) at 19-21. Thus, Duquesne contends that while other EDCs may have been recovering Bill Ready costs through existing rates, not all EDCs were recovering Rate Ready costs through existing rates. According to Duquesne, the fact that it implemented Rate Ready while others had in place Bill Ready provides no support for the OCA's argument that Bill Ready costs should not be recovered through the SMC. Duquesne R. Exc. at 6-7.

4. Disposition

Based upon our review of the evidence of record, we shall adopt the determination of the ALJ that Duquesne's cost to implement Bill Ready billing are properly recoverable through the Company's SMC. We are in agreement with the conclusions of the ALJ that Duquesne was not required to perform a cost-benefit analysis to implement Bill Ready billing and that all customers could potentially benefit from its implementation as suppliers will be able to offer more competitive rates and will enable

them to implement TOU and other RT rates. As such we conclude that it is appropriate and reasonable for Duquesne to recover these costs through its existing SMC mechanism. While we are sensitive to the concerns expressed by the OCA that the EGSs will benefit from the implementation of Bill Ready billing, we are in agreement with Duquesne that there is no reasonable mechanism currently in place to recover these costs from EGSs. Also, we agree with Duquesne that the OCA's suggestion in its Exceptions to introduce a possible mechanism at that late stage of the proceeding is inappropriate and should be rejected.

Accordingly, we shall deny the Exceptions filed by the OCA on this issue and adopt the decision of the ALJ.

G. Incremental Advanced Metering Infrastructure (AMI) Project Costs

1. Positions of the Parties

Concerning the costs of the AMI project, Duquesne contended that the AMI project is complex because of the system functionality, testing and operational requirements. Duquesne asserted that it is important to recognize that it is very difficult to accurately forecast costs for such a significant project, especially when the project must be implemented over a number of years. According to Duquesne, the systems that are being implemented are new, complex IT systems that often require more work than anticipated to achieve the necessary functionality. Duquesne opined that the AMI project is required by statute, and the Company should be permitted to recover all of its prudently incurred costs. Duquesne M.B. at 29-30 (citing Duquesne St. No. 3-R at 3-4).

With respect to the \$54 million increase in AMI-related costs that are unrelated to ADMS, the OCA took the position that with the exception of the \$7 million cost for the Bill Ready functionality, the increase should be approved and permitted to be

recovered through the SMC.¹⁰ According to the OCA, these costs will enable Duquesne to complete implementation of the original portion of its smart meter technology program. OCA M.B. at 24-25.

2. ALJ's Decision

The ALJ concluded that Duquesne's proposed costs to cover the accelerated deployment of its smart meters are appropriate and reasonable and should be permitted to be recovered through the Company's SMC. Furthermore, she found that the accelerated deployment of smart meters is a cost neutral event because the increased deployment costs will be offset by the reduced meter installation and management costs.¹¹ Therefore, the ALJ concluded that the \$54 million in additional costs for the AMI program should be approved. According to the ALJ, Duquesne needs to complete the implementation of the program, and accelerated deployment is consistent with the Commission's stated purposes for the SMP Program in Pennsylvania. I.D. at 58.

3. Disposition

No Party excepts to the ALJ's determination in regard to the incremental AMI costs. Finding the ALJ's decision to be reasonable, appropriate and in accordance with the record evidence, we shall adopt her position on this issue.

¹⁰ OCA St. No. 1 at 16.

¹¹ Duquesne St. No. 1 at 4, 5.

H. Allocation of ADMS Costs

1. Positions of the Parties

In response to the questions posed by the ALJ in her Post-Hearing Order, Duquesne claimed that the Company must install the entire OMS and ADMS project, as proposed, to receive the full voltage monitoring and outage communication capabilities. Duquesne stated that while the ADMS provides benefits to customers that go above and beyond the outage communication and voltage monitoring capabilities, these additional benefits do not require additional costs. Duquesne averred that it could purchase additional systems for the ADMS that would enhance functionality, but has not done so and is not requesting to recover costs for these systems through the SMC. Duquesne M.B. at 30.

Next, Duquesne cited to the *Implementation Order* at 16 wherein the Commission noted that smart meter technology can support more than the capability requirements set forth in Act 129. Duquesne asserted that while the Commission recognized that smart meter technology would provide many benefits to EDCs and to customers, the Commission did not state that costs to implement smart meter technology should be separated between costs for smart meter technology and costs for ancillary functionalities or benefits. Duquesne maintained that in developing its ADMS project, the Company only included components that relate to outage communication, restoration and voltage monitoring. According to Duquesne, any attempt to segregate the specific functionalities provided by the ADMS between smart meter functionalities and non-smart meter functionalities is inconsistent with the *Implementation Order*. Duquesne opined that it would be nearly impossible to attempt to segregate ADMS functionalities in this manner. Duquesne M.B. at 30-31.

The OCA took the position that there appeared to be an imbalance between the cost recovery of ADMS and the expected benefits by rate class. The OCA pointed out that according to the Company's ICE calculator results, only 1.5 percent of the societal benefits will be derived by the residential class, but based upon Duquesne's proposed method of cost recovery, the residential class will be allocated approximately ninety percent of the ADMS costs. The OCA asserted that the existence of this disparity supports its position that recovery of these costs should be sought in a base rate proceeding, where the costs and benefits can be thoroughly examined and issues of cost allocation fully addressed. However, the OCA opined that if the Commission authorizes Duquesne to recover ADMS costs through the SMC, cost allocation under the SMC may need to be addressed to better match costs with benefits. OCA M.B. at 25-26.

2. ALJ's Decision

The ALJ stated that Duquesne acknowledged at the Further Hearing that less than 100% of the cost of the installation of the ADMS is related to smart meter costs. The ALJ asserted that despite being directed to present evidence that breaks out these costs as a percentage, the Company failed to do so or show how much of the cost of the ADMS, which includes the costs of the OMS and DMS, is actually related to smart meter costs. According to the ALJ, she essentially provided Duquesne a "second bite at the apple" when scheduling the Further Hearing and by specifically directing the Company to present detailed cost evidence. However, she explained that Duquesne's response to the Post-Hearing Order was to present the same information as presented at the Initial Hearing. In fact, the ALJ claimed that the only new detailed information divulged at the Further Hearing resulted primarily from the questions she asked. I.D. at 59.

The ALJ posited that Duquesne's responsibility in this proceeding was to provide convincing evidence that its request for a massive increase in smart meter costs,

which subsequently would be borne by all ratepayers, was a justified request. According to the ALJ, Duquesne failed to do so. *Id.*

However, the ALJ explained that her decision to deny assessing the costs of the ADMS through the SMC is not a denial of the ADMS project. She noted that the functionalities provided by the ADMS, OMS and DMS, as outlined by Duquesne, will provide tools and capabilities that will permit the EDC to improve its reliability, provide more competitive opportunities for customers to save money, will likely decrease consumption and will save money for both Duquesne and its customers. The ALJ asserted, however, that seeking ADMS cost recovery through the SMC is the incorrect way for Duquesne to proceed. I.D. at 59-60.

The ALJ concluded that as modeled by the other EDCs, Duquesne should implement the ADMS through base rates. She maintained that in base rates, the costs attributable to the various rate classes can be investigated, evaluated and appropriately allocated. Additionally, she opined that through base rates, the benefits can be quantified and validated using publically available and discernible calculation methods. I.D. at 60.

3. Exceptions and Replies

In its Exceptions, Duquesne states that the ALJ erred in concluding that the Company improperly failed to split the ADMS project between smart meter and non-smart meter functionalities. Duquesne claims that all of the reasonable costs of implementing the OMS are related to outage communications and all of the reasonable costs of implementing the DMS are related to voltage monitoring. Duquesne also states that the Company must install the entire ADMS project, as proposed, to achieve the full voltage monitoring and outage communication and restoration capabilities. Duquesne avers that while the ADMS provides benefits to customers that go above and beyond the outage communication, outage restoration and voltage monitoring capabilities, these

additional benefits do not require additional costs. Furthermore, Duquesne explains that it could purchase additional system enhancements for the ADMS that would enhance functionality beyond the required smart meter requirements, but has not done so and is not requesting to recover such costs for these systems through the SMC. According to Duquesne, the Company limited its ADMS project to costs that are necessary to implement the required smart meter functionality. Therefore, Duquesne posits that there is no basis to segregate the specific functionalities provided by the ADMS between smart meter and non-smart meter functionalities and avers that the ALJ's conclusion should not be accepted. Duquesne Exc. at 22-23.

4. Disposition

Upon our consideration of the evidence of record, we agree with the ALJ's conclusion but note that this issue is essentially moot as we have previously concluded that Duquesne's proposed ADMS project has not been shown to be cost effective in this proceeding. However, it is important to reiterate the ALJ's statement in her Initial Decision that our determination in this proceeding that the ADMS project has not been proven to be cost effective to permit recovery through the SMC should not be interpreted as a blanket denial of Duquesne's potential implementation of the ADMS project. We believe there are potential benefits from these capabilities for the customers of Duquesne and we would encourage the Company to consider going forward with this project and seek recovery through a base rate proceeding where the costs and allocations of those costs are more properly evaluated.

Accordingly, we shall deny the Exceptions filed by Duquesne on this issue and adopt the ALJ's determination.

V. Conclusion

We have reviewed the record as developed in this proceeding, including the ALJ's Initial Decision and the Exceptions and Replies to Exceptions filed thereto. Based on this review, we shall adopt the ALJ's Initial Decision in its entirety and shall deny the Exceptions filed by Duquesne and the OCA in response to the Initial Decision;

THEREFORE,

VI. Ordering Paragraphs

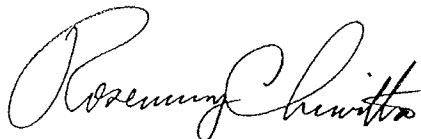
IT IS ORDERED:

1. That the Exceptions filed by Duquesne Light Company on November 28, 2016, to the Initial Decision of Administrative Law Judge Katrina L. Dunderdale issued on November 8, 2016, are denied, consistent with this Opinion and Order.
2. That the Exceptions filed by the Office of Consumer Advocate on November 28, 2016, to the Initial Decision of Administrative Law Judge Katrina L. Dunderdale issued on November 8, 2016, are denied, consistent with this Opinion and Order.
3. That the Initial Decision of Administrative Law Judge Katrina L. Dunderdale, issued on November 8, 2016, is adopted.
4. That the Petition for Approval to Modify the Smart Meter Procurement and Installation Plan filed on August 4, 2015 is denied, in part, in that Duquesne Light Company is not authorized to implement the Automated Distribution Management System because it is not cost effective as proposed.
5. That the Petition for Approval to Modify the Smart Meter Procurement and Installation Plan filed on August 4, 2015, is granted, in part, in that Duquesne Light Company is authorized to incur costs and implement the Bill Ready functionality and the accelerated deployment of Smart Meters.

6. That the Petition to Withdraw filed by Citizen Power, Inc. on November 21, 2016, is granted.

7. That the proceeding docketed at P-2015-2497267 be marked closed.

BY THE COMMISSION,

A handwritten signature in cursive script, reading "Rosemary Chiavetta".

Rosemary Chiavetta
Secretary

(SEAL)

ORDER ADOPTED: March 2, 2017

ORDER ENTERED: April 7, 2017