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E-File

August 31, 2018

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

Re: Petition of PPL Electric for Approval of its Smart Meter Technology Procurement and Installation Plan
Docket No. M-2014-2430781

Dear Ms. Chiavetta:

Enclosed for filing on behalf of PPL Electric Utilities Corporation ("PPL Electric") is PPL Electric's Annual Smart Meter Progress Report. This Report is being filed pursuant to the Implementation Order issued on June 24, 2009 at Docket No. M-2009-2092655.

Pursuant to 52 Pa. Code § 1.11, the enclosed document is to be deemed filed on August 31, 2018, which is the date it was filed electronically using the Commission's E-filing system.

If you have any questions regarding this Report, please call me at (610) 774-4254 or Philip S. Walnock, Project Manager-Advanced Metering for PPL Electric at (610) 774-3228.

Very truly yours,

Amy E. Hirakis

Amy E. Hirakis

Enclosures

cc: Ms. Lori Burger
Mr. Daniel Searfoorce
Certificate of Service

PPL Electric Utilities Corporation

2018 Annual Progress Report

Smart Meter Implementation Plan

(Results to July 31st, 2018)

Docket No. M-2014-2430781

August 31, 2018

Contents

Introduction

On September 3, 2015, the Pennsylvania Public Utility Commission (Commission) approved PPL Electric Utilities Corporation's (PPL Electric or Company) Smart Meter Implementation Plan (SMIP) at Docket No. M-2014-2430781. Pursuant to the Implementation Order entered by the Pennsylvania Public Utility Commission (Commission) on June 24, 2009, at Docket No. M-2009-2092655, PPL Electric submits this smart meter progress report for the second period, July 31, 2017 to July 31, 2018 (Current Reporting Period).

To date, the program is on target with planned functionality schedule; meter installs, and projected cost.

PPL Electric oversees a team of program vendors to assist with the planning and implementation of all aspects of the program. Black &Veatch's role on the Project is to provide PPL Electric with program management services and system integration services. Black & Veatch replaced IBM in August 2017.

The Company's technology supplier and meter vendor is Landis + Gyr. They are providing the radio frequency network, Automated Metering Infrastructure (AMI) head end, meter data management system (MDMS), meters and installation services. They are supported by Grid One and Riggs-Distler for network installation, meter installation and meter base repairs. Tesco Services performs quality auditing of work performed.

GE-Digital is providing Mix Director, the primary software system that the Company will use to monitor the AMI network during deployment and in future operations.

Watthour Engineering Company (WECO) is providing the new meter asset management (MAM) system and test boards that is used to test and track meters and network devices.

BLACK & VEATCH

Black & Veatch is providing project management and end-to-end systems integration services.

Landis+Gyr

Landis + Gyr (L+G) is our vendor for the AMI network devices, AMI meters, meter and network deployment, AMI Head End system and Meter Data Management System (MDMS).

GE Digital

GE Digital is providing **MIx Director**, the primary system that Advanced Metering Operations (AMO) will use to monitor the AMI network.

WECO
WATTHOUR ENGINEERING CO., INC.

WECO is providing the new **Meter Asset Management (MAM)** system and test boards that will be used to test and track meters and network devices.

Program Scope

PPL Electric's Smart Meter Implementation Plan (SMIP) is designed to meet the Act 129 requirements by first deploying the systems and infrastructure required to enable the new Automated Metering Infrastructure technology. This will be followed by the deployment of radio frequency (RF) meters replacing PPL Electric's existing 1.4 million power line carrier (PLC) meters over a four year period.

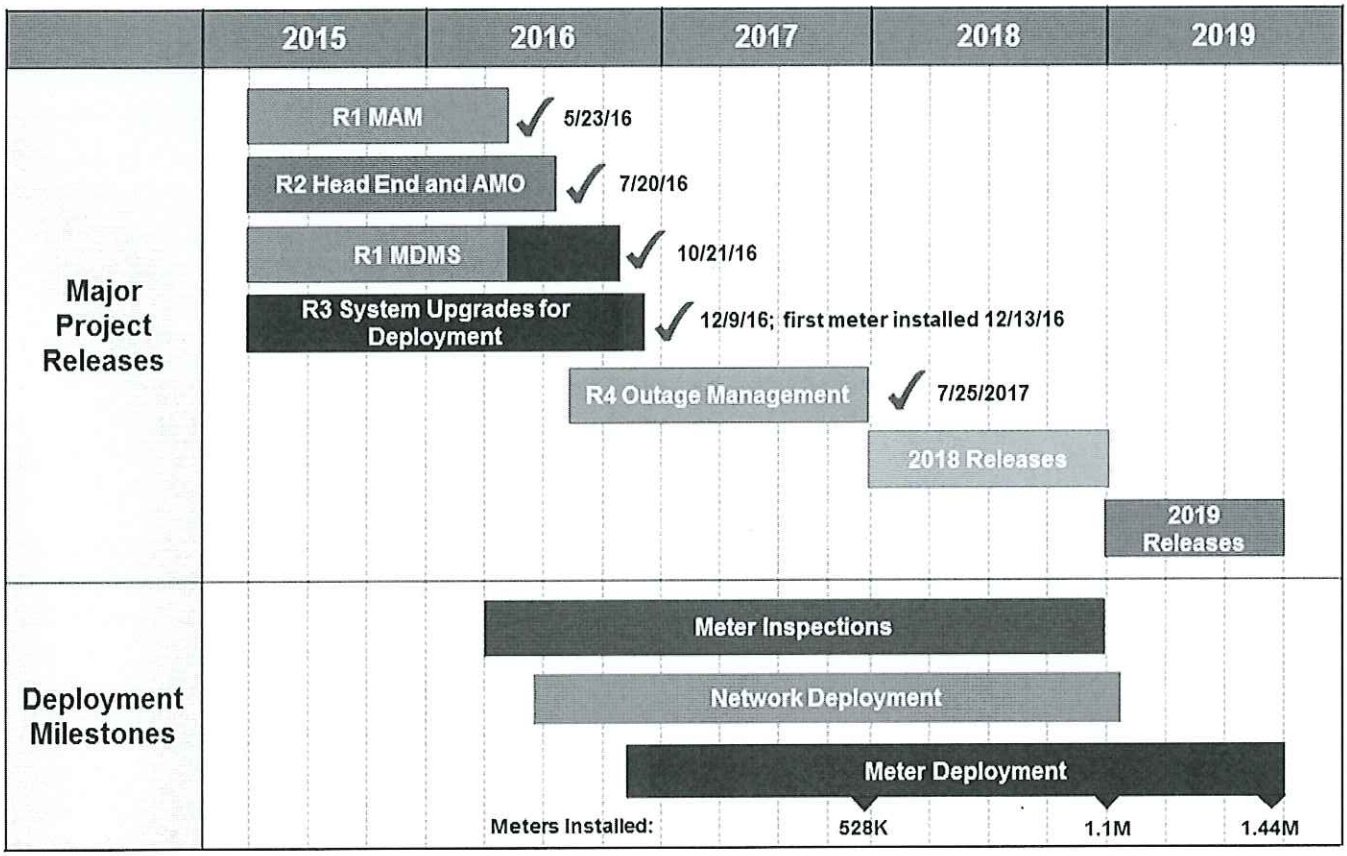
The following items will either be impacted or deployed as part of the program:

- Customer web portal – The portal was updated to display the customer's interval usage
- In home devices – Customer owned devices that connects via ZigBee to the meter and displays energy usage information, Home Area Network (HAN)
- Electric meters – Use two way communication to collect electricity usage and related information from customers and to deliver information to customers
- Local area network (LAN) collectors and routers – Devices used to relay and collect meter data from all meters in a local area and transmit to the head end through a wide area network
- Wide area network (WAN) fiber and cellular backhaul – Communications infrastructure responsible for transmitting the meter data to the head end
- AMI head end - Systems that receive the stream of meter data from the field making the data available for other systems
- Meter data management system (MDMS) – System that collects and stores meter data from the head end system and processes that data into information that can be used by other applications including network operations, customer information system, analytics and asset management
- Meter asset management tool – Tool used to store the meter and network components information and manages the life cycle of the asset
- Mix Director – Tool used to track and perform analysis and analytics on meter and network information, along with deployment and operations

Release Schedule

All of the systems and technology previously mentioned have been deployed or are being deployed. The information technology release schedule below covers the initial deployment of the systems followed by releases of additional capabilities. Releases 1 through 3, completed in 2016, were foundational to enable functionality for the deployment of the radio frequency (RF) meters. Subsequent releases enable advanced capabilities.

Below is an overview of the releases followed a description of the enabling capabilities.



2018 Releases	2019 Releases
Support for a subset of enhanced RF functionality and operational efficiencies **Delivered** ▪ Automation of Work Order Management for the RF Network and Meters ▪ Enhanced Operations Dashboard ▪ Service Delivery Point (SDP) to Electric Facilities Database (EFD) ▪ Home Area Network (HAN) Pilot ▪ Command Center Head End Upgrade **In Progress** ▪ MDMS Estimates for Billing ▪ Badge Scanning and Auxiliary Equipment Management	*Support for a subset of enhanced RF functionality and operational efficiencies* ▪ Time of Use (TOU) Rate Class ▪ Home Area Network Program ▪ Command Center Head End Upgrade ▪ MDMS upgrade ▪ Continued Operations Dashboard Enhancements

Deployment

The Company's deployment plan continues to be executed in accordance with the Smart Meter Plan. The full-scale deployment of RF meters began in December 2016 and continues at this time. The installation of meters continues to move forward with the goal of achieving full deployment in 2019.

Meter deployment is broken into three distinct phases:

- Meter inspections, or pre-sweeps, are performed to identify issues or barriers to be resolved prior to physical meter deployment. An example is the identification of meter bases that need repair or replacement for a successful meter exchange.
- Network deployment is the build-out of the AMI network infrastructure of collectors and routers to transmit data and information from the meter to the AMI head-end system.
- Meter deployment is the physical replacement of the Company's existing PLC meters to new RF meters.

Meter deployment occurs on a regional basis through PPL Electric's six major operating regions. Meter exchanges began in the Harrisburg region in December 2016, the Lancaster region in July 2017, and the Lehigh region in November 2017. The Northeast region started in May 2018; with both the Central and Susquehanna regions slated to start meter exchanges in October 2018 and February 2019, respectively.

Meter Inspections

PPL Electric precedes physical meter deployment with a meter inspection phase. This work started in October 2015 and occurs approximately six to eight months prior to meter installations.

These inspections identify any Rules for Electric Meter Service Installation (REMSI) violations; REMSIs are the Company's standards for meter installations. As stated earlier, PPL Electric is also able to anticipate meter base repairs that will be required in the course of meter deployment. As of July 31, the Company has completed 1,273,168 meter inspections. Harrisburg, Lancaster, Lehigh, Northeast and Central regions meter inspections are complete, with Susquehanna region inspections approximately 21.8% complete and targeted to be completed by the end of this year.

Network Deployment

Deployment of the radio frequency network precedes meter installation by approximately five months. The network is fully built out in the Harrisburg, Lancaster, Lehigh, Northeast regions and will be completed in the Central region August 2018. The Susquehanna region network deployment is targeted for completion in early 2019. Thus, the Company's network deployment is in line with its scheduled plan.

The deployment plan includes a total of 173 collectors, which will form the backbone of the radio frequency network. These collectors are the "take out points" for all network data and they communicate back to the AMI Head End via cellular communications or optical fiber.

The collectors will be supported by approximately 4,600 routers. Routers are radio frequency devices that intercede between meters and other routers to ensure a fully formed radio mesh network allowing for a variety of communication paths from meter to collector. Below is a chart showing the network deployment planned for the remaining areas of PPL Electric's service territory. After the initial deployment of the network components, additional work remains to optimize the network and provide support for maximum effectiveness.

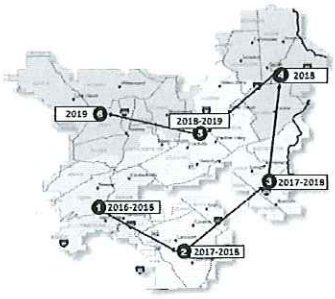
Area	Start	End	Actual Complete
Frackville – Marion Heights	Jun-18	Aug-18	
Bloomsburg	Jul-18	Oct-18	
Williamsport	Sep-18	Nov-18	
Lock Haven - Sunbury	Nov-18	Jan-19	

Meter Deployment

As of July 31, 2018, 909,453 meter exchanges have been completed. Meters in the Harrisburg and Lancaster regions have been exchanged and mass deployment in those regions is complete. The Lehigh region, which started meter deployment November 2017, will complete mass deployment by September 2018. Central region meter deployment is expected to start in October 2018.

The deployment plan targets the installation of 1,100,000 meters by the end of 2018. The current meter installation pace is approximately 41,000 RF meters installed per month.

(as of 8/4/2018)



#	Region	Start	End	Status
1	Harrisburg	Dec 2016	May 2018	99.7% Complete
2	Lancaster	Jul 2017	June 2018	99.5% Complete
3	Lehigh	Nov 2017	Sep 2018	98.8% Complete
4	Northeast	May 2018	Jan 2019	35.3% Complete
5	Central	Oct 2018	Jul 2019	Not Started
6	Susquehanna	Feb 2019	Sep 2019	Not Started

- 'End' represents mass deployment planned completion month

Meter Base Repairs

PPL Electric is repairing meter bases in instances where the meter base conditions may not be conducive to safe meter exchanges. Approximately 8,940 meter base repairs have been completed between July 31, 2017 and July 31, 2018. Repairs are being conducted at a rate of about 1% of the premises where meters have been installed. With a deployment rate of about 41,000 meters per month, the Company expects to see an additional 410 repairs per month. The Company noted in its Smart Meter Plan it anticipated a 1.5% repair rate, which is slightly higher than what is currently occurring.

Progress on the End-to-End Solution

PPL Electric has delivered strong meter reading performance with its legacy PLC based AMI system. Meter read performance of the new RF based system is also performing at a very high level, exceeding the industry standard read rate of 99.5%.

System	Meter Read Performance (Year To Date)
RF	99.94%

Customer Interaction

Consistent with the approved communication plan, all customers are notified of pending meter replacements in several separate contact attempts. Each customer receives a letter six weeks and three weeks prior to the meter exchange. Customers also receive an automated phone call the day before their planned meter exchange. On the day of the installation, the installer knocks on the customer's door prior to the meter exchange. A door hanger is left at the premise at the conclusion of the visit.

PPL Electric has additional online resources for customers who want more information about the program:

- www.pplelectric.com/newmeters
- Meter inspection information: https://www.pplelectric.com/at-your-service/investing-in-your-service/new-electric-meters/meter-verification.aspx

PPL Electric also has a tri-fold brochure that is available through our employees and contractors when a customer requests mailed information.

To date, PPL Electric has received 2021 customer inquiries regarding the program out of 909,453 installations, or 0.22% of the installations. Some topics of these inquiries include:

- Questions regarding field work to be performed or completed
- Questions about scheduling an appointment for a meter exchange
- Statements regarding not wanting a new meter due to health and/or privacy concerns

Remote Connect / Remote Disconnect

Remotely connecting or disconnecting service (RCRD) went live on April 1, 2017. The matrix below outlines transaction success rate by process and overall.

RCRD Performance

		2017	2018 (July YTD)	Project To Date
Cut-Ins	Total Cut-Ins Attempts	8833	9501	18334
	Total # of Successful Cut-Ins	8618	9436	18054
	% Successful Cut-Ins	**97.6%**	**99.3%**	**98.5%**
Cut-Outs	Total Cut-Outs Attempts	11222	12777	23999
	Total # of Successful Cut-Outs	11013	12468	23481
	% Successful Cut-Outs	**98.1%**	**97.6%**	**97.8%**
Move-In	Total Move-In Attempts	10475	14403	24878
	Total # of Successful Move-Ins	10370	14332	24702
	% Successful Move-Ins	**99.0%**	**99.5%**	**99.3%**
Move-Out	Total Move-Out Attempts	8312	12278	20590
	Total # of Successful Move-Outs	7990	12012	20002
	% Successful Move-Outs	**96.1%**	**97.8%**	**97.1%**
Total	**Total Transactions**	**38842**	48959	**87801**
	Total Successful Transactions	**37991**	48248	**86239**
	% Successful Total Transactions	**97.8%**	**98.5%**	**98.2%**

Financial Analysis / Cost Recovery

The financial analysis below shows actual costs per year and split between capital and operational and maintenance costs. This view shows the actual costs since project inception along with projections for future costs.

Actual Spend	**Capital**	**Expense**	**Total**
12/31/2015	$ 24,907,261	$ 2,535,621	$ 27,442,882
12/31/2016	$ 70,874,632	$ 2,426,326	$ 73,300,958
12/31/2017	$ 133,868,867	$ 8,149,909	$ 142,018,776
7/31/2018	$ 73,409,492	$ 5,188,356	$ 78,597,848
Total Project to Date	$ 303,060,252	$ 18,300,212	$ 321,360,464
Projected Spend			
8/1/18-12/31/18	$ 44,840,829	$ 3,777,428	$ 48,618,257
12/31/2019	$ 72,136,172	$ 7,979,289	$ 80,115,461
12/31/2020	$ 16,199,692	$ 1,191,850	$ 17,391,542
Total Projected	$ 133,176,693	$ 12,948,567	$ 146,125,260
Total Actual + Projected	$ 436,236,945	$ 31,248,779	$ 467,485,724

Look Ahead

With meter installations reaching approximately 62% of the Company's customers, PPL Electric has progressed to a steady state portion of the project. The Company anticipates that approximately 1.1 million RF meters to be installed and new releases completed by the end of 2018. PPL Electric is on target for primary RF meter installations to be completed by September 2019 with clean-up activities ending in December 2019.

Conclusion

In summary, PPL Electric is following its approved SMIP without the need for any material modifications. The number of RF meters installed to date, along with the scope, schedule and cost of the program, is in direct alignment with its plan.

CERTIFICATE OF SERVICE

(Docket No. M-2009-2123945 and M-2014-2430781)

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

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Date: August 31, 2018

Amy E. Hirakis