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File #: 153362

March 2, 2015

VIA ELECTRONIC FILING

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

Re: PPL Electric Utilities Corporation
Annual Asset Optimization Plan
Docket No. M-2015-

Dear Secretary Chiavetta:

Enclosed for filing on behalf of PPL Electric Utilities Corporation ("PPL Electric") is the Annual Asset Optimization Plan for the above-referenced proceeding.

On February 27, 2015, PPL Electric filed its Annual Asset Optimization Plan. However, a "Proprietary and Confidential" notation was inadvertently added to pages 11 through 46. These pages are not confidential and said notation has been removed.

Copies will be provided as indicated on the Certificate of Service.

Respectfully submitted,

Christopher T. Wright

CTW/jl
Enclosures

cc: Certificate of Service

CERTIFICATE OF SERVICE

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

Via E-Mail and First Class Mail

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Date: March 2, 2015

Christopher T. Wright

PPL Electric Utilities Corporation

Annual Asset Optimization Plan

March 2015

PPL Electric Utilities Corporation

Table of Contents

Introduction

PPL Electric Utilities Corporation ("PPL Electric or the Company") files this Annual Asset Optimization Plan ("AAO Plan") in compliance with 66 Pa.C.S. § 1356. Section 1356 requires a utility with an approved distribution system improvement charge ("DSIC") and long-term infrastructure improvement plan ("LTIIP") to file an AAO Plan. Consistent with the requirements of Section 1356, PPL Electric's AAO Plan will provide:

> (1) A description that specifies all eligible property repaired, improved and replaced in the immediately preceding 12-month period pursuant to the utility's long-term infrastructure improvement plan and prior year's asset optimization plan; and
>
> (2) A detailed description of all the facilities to be improved in the upcoming 12-month period.

The AAO Plan is part of PPL Electric's overall strategy to proactively repair and replace its aging distribution infrastructure in order to ensure that its system continues to be safe, reliable, and able to meet the needs and expectations of its customers. PPL Electric's plans reflect the Company's ongoing commitment to accelerate its investment, while managing finite resources and ensuring that its portfolio of activities are cost effective. As a result, PPL Electric's plans for the upcoming 12-month period have been developed incorporating the lessons learned from the Company's experience with an effective LTIIP and DSIC.

PROCEDURAL HISTORY

On February 14, 2012, Governor Corbett signed into law Act 11 of 2012 ("Act 11"), which amends Chapters 3, 13 and 33 of the Public Utility Code. Act 11 authorizes electric distribution companies ("EDCs"), natural gas distribution companies ("NGDCs"), water utilities, wastewater utilities and city natural gas distribution operations to establish a DSIC. The DSIC allows utilities to recover reasonable and prudent costs incurred to repair, improve or replace certain eligible property that is part of the utility's distribution system. Eligible property for EDCs is defined in Section 1351 of the statute. See 66 Pa.C.S. § 1351. As a precondition to the initial implementation of a DSIC, each utility must file and obtain approval of a LTIIP that is consistent with the provisions of Section 1352 of the statute. See 66 Pa.C.S. § 1352(a). Act 11 also requires a yearly compliance filing known as an Annual Asset Optimization Plan. See 66 Pa.C.S. § 1356.

On August 2, 2012, the Commission issued its Final Implementation Order establishing procedures and guidelines necessary to implement Act 11. The Final Implementation Order adopted the requirements established in Act 11, provided additional standards that each utility must meet in developing an LTIIP and DSIC, and gave guidance to utilities for meeting the Commission's standards.

On March 14, 2013, the Commission entered a Proposed Rulemaking Order at Docket No. L-2012-2317274 in *Review of Long-Term Infrastructure Improvement Plan*. In its Order, the Commission provided proposed regulations regarding the LTIIP, including information on modification of a utility's LTIIP, and the annual review process for the AAO Plan. On May 23, 2014, after review of comments from interested stakeholders, the Commission issued a Final Rulemaking Order which set forth the elements an LTIIP must contain and outlines the procedure and process for filing and review of LTIIPs and AAOPs. The Final Rulemaking Order was published in the *Pennsylvania Bulletin* on December 20, 2014 (44 Pa.B. 7856) and the final regulations became effective upon that publication.

PPL Electric has been a long-time supporter of implementing a DSIC for EDCs, and has actively participated in the Commission's process to develop the procedures and policies surrounding the Commission's implementation of Act 11. PPL Electric was a participant in the Commission's working groups, and filed comments to both of the Commission's Tentative Implementation Orders.

BACKGROUND

PPL Electric is a public utility and an EDC as defined in Sections 102 and 2803 of the Pennsylvania Public Utility Code, 66 Pa. C.S. §§ 102, 2803. PPL Electric furnishes electric distribution, transmission, and default service electric supply services to approximately 1.4 million customers throughout its certificated service territory, which includes all or portions of twenty-nine counties and encompasses approximately 10,000 square miles in eastern and central Pennsylvania.

PPL Electric filed an LTIIP, on September 18, 2012 at Docket No. P-2012-2325034. In preparing its LTIIP, PPL Electric followed the guidelines established in the Commission's August 2, 2012 Final Implementation Order. The Company's LTIIP was approved as filed on January 10, 2013. On January 15, 2013, PPL Electric filed a petition seeking approval of a DSIC. By Order entered May 23, 2013, the Commission approved PPL Electric's DSIC, subject to refund pending final resolution of certain issues raised by parties to the DSIC proceeding.

Within the LTIIP, PPL Electric categorized its distribution system infrastructure planned for replacements into 32 asset groups and provided a description of the DSIC eligible projects. Details on each of the asset groups included factors used to identify the need for the project, average age of the asset, scope of the project including the number of units to be replaced or improved over the next five years, the approximate location by geographic region for the projects and the yearly expenditures for five years, 2013 to 2017, for each asset class. The Commission determined that the information provided by PPL Electric for the 32 asset groups met the requirements of Act 11.

EXECUTIVE SUMMARY

In developing its AAOP, PPL Electric has included all of the 32 asset groups originally included in its Commission-approved LTIIP. The AAOP provides projected and actual replacement numbers for 2014, and original and revised projections for 2015. PPL Electric maintained the project description provided in the LTIIP, but has added comments to describe the progress of the programs and to explain any deviations from the original projections. While some programs have been modified, due to changing circumstances, PPL Electric does not propose to eliminate any of its programs at this time.

As the table below shows, in 2014 PPL Electric has slightly underran the original amount it projected to spend on DSIC eligible projects. The Company anticipates that it will be slightly over the original LTIIP projections in 2015.

The Distribution Asset Planning process employed by PPL Electric has been focused on maintaining reliability at the level that existed prior to passage of the Electricity Generation Customer Choice and Competition Act ("Customer Choice Act"). Since the 1994-1998 benchmark period, which defines PPL Electric's reliability performance targets, PPL Electric's service reliability has experienced annual swings, positive and negative, resulting largely from varying weather conditions. Increased and accelerated levels of funding for distribution reliability programs will help to ensure more consistent performance below the PUC benchmark. Historical benchmark performance is illustrated below.

PPL Electric Utilities Corporation

	2010	2011	2012	2013	2014
SAIFI (Benchmark = 0.98; rolling 12-month Std. = 1.18)	1.087	1.071	1.076	0.082	0.92
CAIDI (Benchmark = 145; Rolling 12-month Std. = 174)	135	151	152	108	180
SAIDI (Benchmark = 142; Rolling 12-month Std. = 205)	147	162	164	89	165
MAIFI	4.96	5.033	4.11	3.54	3.26
Average Number of Customers Served	1,388,192	1,389,884	1,392,408	1,395,325	1,399,535
Number of Sustained Customer Interruptions (Trouble Cases)	20,081	18,403	16,384	14,400	17,388
Number of Customers Affected	1,508,319	1,489,203	1,497,660	1,140,583	1,284,603
Customer Minutes of Interruptions	203,963,698	225,087,897	228,143,195	123,601,330	230,750,454
Number of Customer Momentary Interruptions	6,510,312	6,994,790	5,716,569	4,936,544	4,559,353

Because approximately 40% of the capital dollars for distribution operations is allocated to Act 11 projects, the assumption was made that 40% of the FTE (Full Time Equivalent) positions would be used for Act 11 purposes as well. The only break down available is between PPL Electric (PPL) and contract (COC) employees; there is no further breakdown available at a field/supervisory level. The data shown below are for FTE only.

YEAR	PPL	COC	Total
2014	281	101	382
2015	285	104	388

PPL Electric Utilities Corporation

Asset Repair/ Upgrade/ Replacement Expenditures				
Infrastructure Initiative	2014 LTIIP	2014 Actuals	2015 LTIIP	2015 Forecast
Distribution Pole Replacements	$4.00	$6.15	$4.40	$7.18
C-Truss Distribution Poles	$1.54	$2.88	$1.57	$3.07
Fiber Wrap Distribution Poles	$1.58	$2.25	$1.57	$3.32
Recloser Replacements	$5.72	$2.26	$5.76	$4.44
Capacitors	$0.23	$0.86	$0.28	$0.00
New Hydraulic Reclosers	$0.70	$0.54	$0.62	$0.73
Distribution Animal Guarding	$1.50	$0.64	$1.52	$1.27
Distribution Failed Equipment	$13.17	$14.38	$13.88	$12.10
Replace Failed Underground Primary Cable	$3.48	$4.30	$3.50	$3.29
Replace Failed Underground Secondary Cable	$1.90	$3.91	$1.95	$4.33
Replace Failed 12kV Underground Getaway Cable	$0.47	$0.91	$0.48	$0.94
Replace Deteriorated/Failed Low-Tension Network Equipment and Structures	$1.52	$1.32	$1.34	$1.18
Underground Residential Development Cable Replacement and Life Extension	$9.66	$9.54	$9.97	$10.12
Low Tension Network Primary Cable, Equipment and Structures	$8.56	$2.93	$4.61	$6.75
12 kV Underground Getaway Cables	$5.02	$2.17	$5.80	$5.48
Copper Weld Copper	$6.56	$2.89	$5.92	$4.48
Customers Experiencing Multiple Interruptions	$2.37	$2.49	$2.44	$2.21
Distribution Reliability Preservation	$7.39	$10.37	$7.27	$8.79
Reliability Preservation Emergent	$1.13	$1.86	$1.55	$1.81
Circuit SAIDI Improvement	$8.44	$4.74	$8.76	$1.97
Distribution Automation Development	$14.73	$17.23	$21.29	$23.40
Improve System Reliability Projects	$15.07	$9.22	$15.31	$9.51
Unreimbursed Highway Relocations	$2.96	$4.42	$3.05	$4.67
Distribution Substation Circuit Breakers	$3.24	$6.05	$4.30	$6.79
Substation 69/12 kV Transformer Replacement	$7.76	$2.74	$3.40	$4.13
Protection and Control	$0.88	$0.26	$1.00	$1.17
Cross-Yard 12 kV Underground Tie	$1.06	$1.28	$1.09	$1.47
Replace Deteriorated/Failed Area Supply Substation Equipment	$1.09	$5.05	$1.12	$2.10
Repair Failed 138/69 12 kV Transformers	$1.10	$0.00	$1.14	$0.33
Distribution Substation DC Equipment	$0.37	$0.28	$0.39	$0.34
Miscellaneous Substation Equipment	$1.06	$1.15	$1.67	$1.49
Substation Animal Guarding	$2.46	$2.81	$2.55	$2.55
Grand Total	**$136.72**	**$127.92**	**$139.50**	**$141.40**

Dollars in Millions

Almost all of the initiatives shown in the above table take advantage of new technologies that did not exist when the associated assets were originally placed into service, and many of these technologies are very recent innovations. These technologies are expected not only to restore the assets to their original level of performance, but, in many cases, provide performance well beyond what previously was achievable in order to ensure and maintain adequate, efficient, safe, and reliable service.

Some of the initiatives, such as animal guarding, clearly have implied end-points, where no further opportunities for improvement remain. Others, such as Circuit SAIDI improvements, eventually experience diminishing returns over time. Other initiatives, such as pole reinforcement and replacement, will be ongoing. Finally, some programs may become obsolete, while new programs may become desirable as a result of the evolution of new technologies. Because of these and other variables, the effectiveness of these programs is reviewed on a regular basis – at least every two years – and programs are added, deleted, and/or modified, as necessary, to ensure that the expenditures are providing the desired benefits to customers at a reasonable cost.

Distribution Assets

The following pages set forth actual results for calendar year 2014 and revised projections for calendar year 2015. These assets include, but are not limited to, the following:

- Structures
  - Poles
  - Crossarms
  - Vaults
  - Manholes
- Overhead Conductors and Hardware
- Underground Cables and Hardware
- Switching Devices
  - Air Break Switches
  - Disconnect Switches
  - Switching Cabinets
- Protective Devices
  - Fuses
  - Reclosers
  - Network Protectors
  - Lightning Arresters
- Transformers
  - Overhead
  - Pad-Mounted
  - Submersible
  - Low Tension Network

Distribution Pole Replacements

Program Description and Purpose

Replacement of distribution wood poles identified as non-restorable (cannot be reinforced) during the annual inspect and treat program or during a spot inspection in an effort to improve public and employee safety, as well as service reliability. This program contributes to storm hardening efforts and aims to improve public and employee safety, as well as service reliability, by reducing potential pole failures.

Identification/Justification Process

PPL Electric inspects approximately 90,000 poles per year. Historical data suggests an approximate 5% rejection rate from the population of yearly inspections; of those rejected, 70% are candidates for reinforcement while 30% are candidates for replacement. PPL Electric is in the process of incorporating additional reinforcement technologies that are projected to reduce the replacement rate to approximately 15%. Replacing rejected poles avoids property damage and risk of accidental injury, and it mitigates the costs associated with extended service outages. Replacement rates are expected to fall as a result of PPL Electric's pole treatment program. The average age of an in-service wooden distribution pole is 35 years.

Scope

The scope of the program is a direct correlation to the number of wood pole inspections.

Replacements in Units	**2014**	**2015**
Original LTIIP	600-800	600-800
Future YR Adjusted / Current YR Actual	**1300-1500**/ 1,251	**1,200-1,400**

Locations

Specific locations are a direct correlation to the wood pole inspection plan. Inspection locations are identified yearly by reviewing potential SAIFI impacts of geographic areas, as well as ensuring cost-effectiveness of the program and minimizing inspection crew movements.

Planned Expenditures

Planned Expenditures	**2014**	**2015**
Original LTIIP	$4.00M	$4.40M
Future YR Adjusted / Current YR Actual	**$8.08M**/ $6.15M	**$7.18M**

Comments:

In 2014, the overall inspection failure rate increased from 6.5% in 2013 to 8.8%. However, this was mitigated by an increase in the number of failed poles which could be remediated via steel reinforcement or Fiber Wrapping. 84% of all failures were able to be reinforced, including 14% via Fiber Wrapping. Current data affirms early projections showing that Fiber Wrapping will save an average of 16% of the original reject population. As PPL Electric cycles through the inspection process, the pole plant population

continues to age; as a consequence, the rejection rate is expected to continue to increase slightly every year until a steady-state is achieved after completion of the full inspection cycle (2018).

C-Truss Distribution Poles

Program Description and Purpose

Steel reinforcement (C-Trussing) of deteriorated distribution wood poles in order to restore the pole's original strength, ensure public safety, and maintain reliable electric service through the reduction of potential pole failures. This program contributes to storm hardening efforts by reducing potential pole failures.

Identification/Justification Process

PPL Electric inspects approximately 90,000 poles per year. Historical data suggests an approximate 5% rejection rate from the population of yearly inspections, of which historically 70% are candidates for steel reinforcement. When applicable, this method achieves a significant savings over pole replacement.

Scope

Reinforcements in Units	**2014**	**2015**
Original LTIIP	2800-3200	2800-3200
Future YR Adjusted / Current YR Actual	**5000-5500**/ 5,590	**5400-5900**

Locations

Locations identified for C-trussing are a direct correlation to the number of wood pole inspections.

Planned Expenditures

Planned Expenditures	**2014**	**2015**
Original LTIIP	$1.54M	$1.57M
Future YR Adjusted / Current YR Actual	**$2.96M**/ $2.88M	**$3.07M**

Comments:

In 2015, PPL Electric is increasing the volume of pole inspections by 27%, or an additional 24,000 poles. This increase is to accommodate poles which could not be inspected in earlier inspection years. As a result, we expect to continue to remediate a high volume of poles via steel reinforcement and may see increases beyond 2014 actuals.

Fiber Wrap Distribution Poles

Program Description and Purpose

Fiber reinforcement of deteriorated distribution wood poles to improve the pole's strength, ensure public safety and maintain reliable electric service through the reduction of potential pole failures. Fiber wrapped poles are restored to 85% original strength. Fiber wrap is a reinforcement method by which a standing pole in Pennsylvania Department of Transportation (PennDOT) right of way is wrapped and cured in fiber reinforcement materials. This program contributes to storm hardening efforts and aims to improve public and employee safety, as well as service reliability, by reducing potential pole failures.

Identification/Justification Process

Fiber wrap candidates are selected from a pool of non-restorable poles in PennDOT's right-of-way on the basis of the condition of pole, the age of pole and the cost of replacement. Historically, reinforcement of poles within PennDOT right-of-way was not practiced and all poles that did not pass inspection were replaced. In an effort to increase cost-effectiveness, PPL Electric began fiber wrap reinforcement during 2012 and expects to reduce the number of pole replacements from 30% of rejected poles to 15%. Shifting capital from replacement to fiber wrap allows capital to be invested in more effective areas.

Scope

Fiber Wrap in Units	**2014**	**2015**
Original LTIIP	700-900	700-900
Future YR Adjusted / Current YR Actual	**1000-1200**/ 1086	**1250-1450**

Locations

Locations identified for fiber wrap are a direct correlation to the wood pole inspection plan.

Planned Expenditures

Planned Expenditures	**2014**	**2015**
Original LTIIP	$1.58M	$1.57M
Future YR Adjusted / Current YR Actual	**$2.62M/** $2.25M	**$3.32M**

Comments:

In 2015, PPL Electric is increasing the volume of pole inspections by 27%, or an additional 24,000 poles. This increase is to accommodate poles which could not be inspected in earlier inspection years. As a result, we expect to continue to remediate a high volume of poles via fiber wrapping and may see increases beyond 2014 actuals.

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Recloser Replacements

Program Description and Purpose

Proactive refurbishment and replacement of oil-circuit reclosers ("OCRs") to improve reliable service by reducing equipment failures. OCRs are used on main 12 kV lines and on three-phase and single-phase taps to minimize the number of customers affected by a sustained outage. Devices are replaced through specific maintenance and required refurbishment/replacement schedules in an effort to reduce OCR failures.

Identification/Justification Process

Candidates are identified based on an adherence to an eight-year cycle, not the age of the device. An eight-year cycle ensures compliance with the PUC's Inspection & Maintenance Standards.

Scope

Replacements in Units	**2014**	**2015**
Original LTIIP	700-1000	700-1000
Future YR Adjusted / Current YR Actual	**150-250/** 126	**100-125**

Locations

Region	**2014 Actual**
Lehigh	37
Northeast	15
Central	34
Susquehanna	9
Harrisburg	10
Lancaster	21

Planned Expenditures

Planned Expenditures	**2014**	**2015**
Original LTIIP	$5.72M	$5.76M
Future YR Adjusted / Current YR Actual	**$2.29M/** $2.26M	**$4.44M**

Comments:

The recloser replacement program is changing significantly in 2015 to replace all existing three-phase reclosers with intelligent vacuum circuit reclosers with remote capability on a ten year cycle in order to move to condition based maintenance and improve reliability. In 2014, refurbishment of the single phase recloser was stopped and this was the last year existing hydraulic three-phase reclosers were refurbished. This change was reviewed with the PUC staff in January 2014.

Capacitors

Program Description and Purpose

Installation of capacitors on the 12 kV system to achieve a unity power factor on the high side of the distribution substation transformers ensuring required overall power quality.

Identification/Justification Process

Capacitors are installed on the 12 kV system using VAR requirements that are identified annually by PPL Electric's distribution planning resources. PJM requires a minimum power factor of 0.97 as measured at the transmission/distribution interface point. Scope is determined by MVAR requirements to support any system shortages. Regional splits are analyzed annually based on need.

Scope

Installations in Units	**2014**	**2015**
Original LTIIP	17-23	17-23
Future YR Adjusted / Current YR Actual	**17-23/** 29	0

Locations

Region	**2014 Actual**
Lehigh	10
Northeast	2
Central	4
Susquehanna	5
Harrisburg	5
Lancaster	3

Planned Expenditures

Planned Expenditures	**2014**	**2015**
Original LTIIP	$.23M	.28M
Future YR Adjusted / Current YR Actual	**$.24M/** $.86M	**$0**

Comments:

The overrun was attributed to work performed at Trexlertown Sub related to voltage issues. This resulted in a tap change on the substation transformer and the installation of 5 capacitors. No work is planned in 2015 as the remaining scope has been moved to the capacitor automation program.

New Hydraulic Reclosers

Program Description and Purpose

Proactive installation of new hydraulic reclosers to improve reliability performance by increasing circuit sectionalizing ability. Reclosers minimize the number of customers affected by a sustained outage.

Identification/Justification Process

Locations are requested by regional reliability engineers and prioritized annually based on anticipated SAIDI savings. A gradual scope reduction is assumed in the outer years as a result of saturation of reclosers and other distribution automation equipment.

Scope

Installations in Units	2014	2015
Original LTIIP	20-25	15-20
Future YR Adjusted / Current YR Actual	**35-40**/ 29	**35-40**

Locations

Region	2014 Actual
Lehigh	2
Northeast	8
Central	8
Susquehanna	10
Harrisburg	0
Lancaster	1

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$.70M	$.62M
Future YR Adjusted / Current YR Actual	**$.71M/** $.54M	**$.73M**

Comments:

In 2014, fewer single-phase hydraulic reclosers were installed in favor installing intelligent vacuum circuit reclosers with remote capability as part of the Smart Grid initiative. Due to the change of the recloser refurbishments program scope only focusing on three-phase reclosers, this budget will include the new installation of single phase hydraulic reclosers and installation of larger single-phase hydraulic reclosers to replace single phase reclosers that are at a potential to be overloaded.

Distribution Animal Guarding

Program Description and Purpose

Proactive installation of animal guards on existing distribution overhead transformers and air break switches to improve circuit reliability. Animal guards help prevent animal-related contacts which cause service interruptions.

Identification/Justification Process

Densities of transformers and air breaks are grouped together in a location. Locations are determined by a vectoring approach which identifies the most cost-effective locations, focusing on high-density outage areas susceptible to animal contacts.

Scope

Areas To Address	2014	2015
Original LTIIP	40-60	40-60
Future YR Adjusted / Current YR Actual	**75-100**/ 128	**125-175**

Locations

Region	2014 Actual
Lehigh	21
Northeast	4
Central	39
Susquehanna	22
Harrisburg	23
Lancaster	19

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$1.50M	$1.52M
Future YR Adjusted / Current YR Actual	**$.70M**/ $.64M	**$1.27M**

Comments:

A change in the way the Company managed the work allowed it to address more areas at a reduced cost. Work was completed more efficiently by bundling work; additionally, the areas targeted for 2014 were geographically closer together, or more densely populated.

Distribution Failed Equipment

Program Description and Purpose

Replacement or repair of failed or deteriorated capital units of distribution equipment, excluding underground cable, in order to maintain adequate service reliability.

Identification/Justification Process

Candidates are identified via inspections, both planned and ad-hoc, as well as actual outages and power service problems. Budget allocations are based on historical trends of hours charged to corrective work, in addition to projected trends of future equipment failures. Examples include, but are not limited to, failed reclosers, poles, capacitor banks, and air breaks.

Scope & Locations

Scope and locations are determined as equipment fails.

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$13.17M	$13.88M
Future YR Adjusted / Current YR Actual	**$16.36M/** $14.38M	**$12.10M**

Comments:

The budget increased in 2014 based on a slight increase in the historical failure rates and to address the lower priority work not completed the prior year.

Replace Failed Underground Primary Cable

Program Description and Purpose

Replacement of failed underground residential primary cables in order to maintain adequate service reliability.

Identification/Justification Process

Candidates are identified via actual failures. Cables which have failed for the second time in a calendar year, or for the third time in their lifetime are replaced instead of repaired. Cables which fail only once are typically repaired on-site. Budget recommendations are based on historical trends of hours charged to corrective work, in addition to projected trends of future equipment failures. PPL Electric has initiated a program to cable cure failed cables to extend the cable lifetime at a lower cost than replacement. This may cause a reduction in this budget over time because fewer failed cables will be replaced.

Scope & Locations

Scope and locations are determined as cable fails.

Planned Expenditures

Planned Expenditures	**2014**	**2015**
Original LTIIP	$3.48M	$3.50M
Future YR Adjusted / Current YR Actual	**$3.50M/** $4.3M	**$3.29M**

Comments:

The 2014 actual expenditures exceeded the planned expenditures due to invoicing issues with the contractor, and the amount of material, work, and labor charges for the individual work. Work for 2015 is being planned under a new invoicing process with the contractor to alleviate any overruns for this year.

Replace Failed Underground Secondary Cable

Program Description and Purpose

Replacement of failed underground residential secondary cables in order to maintain adequate service reliability.

Identification/Justification Process

Candidates are identified via actual failures, customer complaints and poor neutral test results. Budget recommendations are based on historical trends of hours charged to corrective work, in addition to projected trends of future equipment failures.

Scope & Locations

Scope and locations are determined as cable fails.

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$1.90M	$1.95M
Future YR Adjusted / Current YR Actual	**$3.10M/** $3.91M	**$4.33M**

Comments:

The spending on failed secondary replacements was higher than projected in 2014 due to an increased number of replacements. Because many underground secondary cables are reaching the end of their expected life, a decision was made to eliminate the budget for the repair of failed secondary cables and replace all failed secondary cables in order to reduce the number of customers affected by failed secondary cables.

Replace Failed 12 kV Underground Getaway Cables

Program Description and Purpose

Replacement of failed 12 kV underground getaway cables in order to maintain adequate service reliability. Getaway failures can result in long duration outages. Getaway cables connect substations to outgoing feeders beyond the substation perimeter.

Identification/Justification Process

Candidates are identified via actual failures. Budget recommendations are based on historical trends of hours charged to corrective work, in addition to projected trends of future equipment failures.

Scope & Locations

Scope and locations are determined as cable fails.

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$.47M	$.48M
Future YR Adjusted / Current YR Actual	**$.75M**/ $.91M	**$.94M**

Comments:

This program has been modified to replace cables that fail a diagnostic test in addition to failed cables because there is a high probability of future outages to customers. There was an increase in the spending for cable failures in 2014 because the cost for replacements is higher than projected. As a result, the budget has been increased in 2015 to address this projected unit cost increase.

Replace Deteriorated/Failed Low Tension Network Equipment and Structures

Program Description and Purpose

Replacement or repair of deteriorated and failed equipment related to low-tension networks, including submersible transformers, network protectors, manholes, and vault tops in order to maintain adequate service reliability. Low-tension networks are low voltage underground distribution facilities found in urban areas.

Identification/Justification Process

Candidates are identified via actual failures, inspections, testing, or work on the system. Budget recommendations are based on historical trends of hours charged to corrective work, in addition to projected trends of future equipment failures.

Scope & Locations

Scope and locations are determined as cable fails.

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$1.52M	$1.34M
Future YR Adjusted / Current YR Actual	**$1.23M**/ $1.32M	**$1.18M**

Comments:

The 2014 budget overrun was driven by two work orders which were prolonged due to safety and right of way (ROW) issues and material delays.

Underground Residential Development Cable Replacement and Life Extension

Program Description and Purpose

Programmatic replacement and treatment of deteriorated underground residential development ("URD") cable to maintain reliable electric service in residential developments. PPL Electric's course of action is to treat entire developments where possible.

Identification/Justification Process

Candidate developments are selected based on history of cable failures. Once the initial failure is treated, remaining cable sections in that development are tested. Test results drive the decision to either replace the cable or treat it with a compound to restore cable insulation, known as cable curing. The profile of URD cable varies across URDs, thus making it difficult to predict whether cable curing or replacement will be the prevalent course of action in a given URD. On a system-wide basis, however, historical experience indicates that of the total number of cables in troubled URD locations, typically 35% can be cured, 25% require replacement, and 40% do not require immediate remediation.

Regional allocation of cable remediation is based on historical regional percent contribution to system-wide cable failures.

Scope

Scope In Cable Sections	Treatment	2014	2015
Original LTIIP	**Replacement After Test**	350-400	350-400
Future YR Adjusted / Current YR Actual	**Replacement After Test**	**175-250/** 193	**175-250**
Original LTIIP	**Cure**	750-800	750-800
Future YR Adjusted / Current YR Actual	**Cure**	**550-600/** 534	**700-750**
Original LTIIP	**Proactive Replacement**	150-200	150-200
Future YR Adjusted / Current YR Actual	**Proactive Replacement**	**105-125/** 127	**105-125**

Planned Expenditures

Planned Expenditures	2013	2014	2015
Original LTIIP	$11.54M	$9.66M	$9.97M
Future YR Adjusted / Current YR Actual	$9.14M	**$8.81M/** $9.54M	**$10.12M**

Comments:

The ratio of the number of cables able to be cured to the number of cables submitted to the cable curing contractor increased in 2014. Therefore, a larger number of cable segments were able to be cured in 2014. We are forecasting a higher number of cable segments to be cured in 2015.

Low Tension Network Primary Cable, Equipment and Structures

Program Description and Purpose

Programmatic replacement of deteriorated equipment related to low-tension networks, including: paper insulated lead cable (PILC), submersible transformers, network protectors, manholes, and vault tops. The purpose of this program is to ensure public safety and service reliability through the replacement of underground facilities that have reached the end of their expected life or show signs of premature age from prolonged exposure to corrosive environments.

Identification/Justification Process

Vintage PILC cable has a documented history of problems and was deemed prudent to replace entirely. Replacement and repair of manhole and vault tops is determined by regular inspection. Transformer and network protector replacements are determined through inspection and age, where assets exceeding 40 years in service are considered highest priority.

Scope

Replacements in Units		2014	2015
Original LTIIP	**Lead Cable (miles)**	4.75	0
Future YR Adjusted / Current YR Actual	**Lead Cable (miles)**	**1.60/** 1.5	**.5**
Original LTIIP	**LTN Equipment**	70-90	50-70
Future YR Adjusted / Current YR Actual	**LTN Equipment**	**15-20/** 12	**30-40**

Locations

PPL Electric Utilities Corp.

Region	2014 Actual
Lehigh	2
Northeast	1
Central	2
Susquehanna	0
Harrisburg	7
Lancaster	0

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$8.56M	$4.61M
Future YR Adjusted / Current YR Actual	**$5.10M/** $2.93M	**$6.75M**

Comments:

The underrun in 2014 was due to work being deferred out of 2014 into 2015. The funding in 2014 has been reduced compared to the original plan in order to reallocate funds to other LTIIP projects that will provide a greater overall reliability benefit.

This program was tracked by number of projects (or Work Orders) as it was concluded the original measurement in the LTIIP was not able to be tracked in our asset management tool. The dollars were not impacted in how this program is now being measured.

12 kV Underground Getaway Cables

Program Description and Purpose

Programmatic replacement of aging 12 kV underground getaway cables, with an emphasis on conversion to overhead design, to prevent service outages and reduce outage durations for improved reliability.

Identification/Justification Process

Getaways are selected on a basis of failure history, cable test results, and age. Cables that are older than 40 years and serve a large number of customers are given highest priority. The average age for UG cables identified for replacement is 38 years.

Scope

PPL Electric Utilities Corp.

Replacements in Units	2014	2015
Original LTIIP	50-55	60-65
Future YR Adjusted / Current YR Actual	**18-20/** 18	**30-40**

Locations

Region	2014 Actual
Lehigh	4
Northeast	3
Central	2
Susquehanna	1
Harrisburg	3
Lancaster	5

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$5.02M	$5.80M
Future YR Adjusted / Current YR Actual	**$2.37M/** $2.17M	**$5.48M**

Comments:

The budget for the proactive replacement of underground getaway cables was reduced for 2014 to provide additional funding for other LTIIP projects that will provide a greater reliability benefit. In addition, costs have been higher than initially estimated and so overall scope has been reduced to meet the planned spending.

Copper Weld Copper Replacement

Program Description and Purpose

Programmatic replacement of overhead #6 Copper, and #6, #6A and #7A Copper Weld overhead conductor to improve reliability of service by reducing potential for long-duration conductor failures. Such vintages of conductor are known to anneal and are often found in heavily wooded areas of the service territory where relocation, along with reconductoring, help to ensure future outages can be restored more quickly. PPL Electric currently is evaluating expanding this program to include other types of vintage cables/conductors.

Identification/Justification Process

Circuits are prioritized by an algorithm that weighs the amount of copper on the line and historic customer service interruptions.

PPL Electric Utilities Corporation

Scope

Projects	2014	2015
Original LTIIP	31-34	29-31
Future YR Adjusted / Current YR Actual	**18-22**/ 28	**18-22**

Locations

Region	2014 Actual
Lehigh	14
Northeast	2
Central	6
Susquehanna	4
Harrisburg	1
Lancaster	1

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$6.56M	$5.92M
Future YR Adjusted / Current YR Actual	**$2.65M/** $2.89M	**$4.48M**

Comment:
This program was tracked by number of projects (or Work Orders) as it was concluded the original measurement in the LTIIP was not able to be tracked in the Company's asset management tool. The dollars were not impacted in how this program is now being measured.

The program was modified to break existing work into smaller projects, which impacted the composite of work (scope and dollars) in each year.

Customers Experiencing Multiple Interruptions

Program Description and Purpose

Improve reliability for customers experiencing multiple interruptions ("CEMI") via upgrades to their circuits. The purpose of the program is to prevent future outages from occurring and to increase communication with customers who experience five or more service outages within a one year period.

Identification/Justification Process

Projects are identified by regional distribution planners and regional reliability supervisors once a circuit has customers who exceed a threshold of five or more service interruptions within a calendar year. Projects are vetted at a cross-functional task force meeting for approval and ranked systematically based on historical CEMI performance, year-to-date CEMI performance, cost per customer benefit, and expected reliability improvements. Examples include, but are not limited to, reconductoring lines, replacing and/or relocating protective equipment with new equipment, and building new tie lines to improve switching capabilities. It should be noted that sizes of projects vary significantly which can result in material swings in the number of planned projects.

Scope

Projects	2014	2015
Original LTIIP	15-35	15-35
Future YR Adjusted / Current YR Actual	**25-40**/ 24	**15-30**

Locations

Locations are identified based upon emergent reliability needs.

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$2.37M	$2.44M
Future YR Adjusted / Current YR Actual	**$3.06M**/ $2.49M	**$2.21M**

Comments:

Because the nature of the projects that have been identified to improve the reliability of customers experiencing multiple interruptions is varied, the cost of the projects will also vary significantly. Smaller projects resulted in less spend than anticipated in 2014.

Distribution Reliability Preservation

Program Description and Purpose

Upgrades to the distribution system as justified by regional reliability supervisors to improve reliability. Improvements are targeted towards WPCs, circuits with a history of customer complaints, or recommendations as a result of EORs. EORs are detailed reliability and operational analysis performed on 25% of a region's distribution circuits per year.

These projects are outside the scope of the Worst Performing Circuit program because they are smaller in nature and can be more quickly engineered and constructed.

Identification/Justification Process

Regional reliability supervisors identify and submit requests for small-scale circuit improvement projects. Projects under $50,000 are directly identified by the regions, approximately 60% of the budget is allotted towards these small improvements. Projects over $50,000 are ranked utilizing PPL Electric's investment prioritization tool to ensure funds are directed towards the most cost-effective projects. The number of projects and locations may vary depending on areas with reliability concerns. Examples include, but are not limited to, installation of fuses, fault indicators, reconductoring of vintage conductor, upgrading conductor to reduce impact of vegetation related service outages, and relocating sections of lines that may be inaccessible or prone to vegetation related service outages.

It should be noted projects vary significantly in size, which can result in material swings in the number of planned projects.

Scope

Projects	2014	2015
Original LTIIP	150-300	150-300
Future YR Adjusted / Current YR Actual	**400-550/** 454	**250-350**

Locations

Locations are identified based upon emergent reliability needs.

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$7.39M	$7.27M
Future YR Adjusted / Current YR Actual	**$10.54M/** $10.45M	**$8.79M**

Comments:

For 2014, PPL Electric made a strategic decision to reclassify projects greater than approximately $300,000 to a specific project under the System Reliability Improvement Projects. All projects greater than $150,000 will continue to be ranked through the Company's investment prioritization tool. With moving these larger projects to standalone projects, it allowed for a greater number of smaller reliability projects to be completed. Additional funding was allocated to this program in 2014 due to the increased reliability impact that these projects have on overall reliability.

Reliability Preservation Emergent

Program Description and Purpose

Remediation of issues primarily associated with secondary voltage and emergent small-scale customer reliability needs in order to improve reliability.

Identification/Justification Process

Work is identified by line crews, as well as through customer calls, and is completed to avoid potential service outages, power quality concerns and safety issues. Examples include, but are not limited to, modifying capacitance to address voltage concerns, installing fusing to aid in sectionalizing, installing animal guards after multiple animal caused outages, and replacing transformers to resolve transformer overload. Budget recommendations are based on historical trends of hours charged.

Scope & Locations

Scope and locations are determined as emergent needs arise.

Planned Expenditures

Planned Expenditures	**2014**	**2015**
Original LTIIP	$1.13M	$1.55M
Future YR Adjusted / Current YR Actual	**$1.52M**/ $1.86M	**$1.81M**

Comments:

The overrun in 2014 was in line with historical trend of actual spend, which resulted in adjusting the budget for 2015 to support this trend.

Circuit SAIDI Improvement

Program Description and Purpose

Proactive installation of reclosers and air breaks with communications capabilities or the upgrade of existing reclosers and air breaks to include communication capability. Such installations allow for remote operation and monitoring of circuit sectionalizing equipment. This program also includes installation of manual switches to address emergent reliability issues. The results of these improvements are threefold:

- Reduce the number of upstream customers affected by a service outage.
- Reduce the time necessary to restore customers by transferring circuit sections to alternate sources and limiting long-duration service outages to smaller circuit sections involving fewer customers.
- Facilitate fault location and reduce the time necessary for repair and restoration.

Identification/Justification Process

Candidate locations are those that have experienced substandard reliability, as determined by system SAIDI contribution, and could benefit from improved sectionalizing capability.

It should be noted that projects vary significantly in size, which can result in material swings in the number of planned projects.

Scope

Installations in Units	2014	2015
Original LTIIP	150-300	150-300
Future YR Adjusted / Current YR Actual	**150-200**/ 149	**50-60**

Locations

Region	2014 Actual
Lehigh	18
Northeast	31
Central	28
Susquehanna	36
Harrisburg	20
Lancaster	16

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$8.44M	$8.76M
Future YR Adjusted / Current YR Actual	**$7.00M**/ $4.73M	**$1.97M**

Comments:

In 2014, the last of the motorized switches were installed or retrofitted which resulted in less spend than anticipated. In 2015, instead of a mix of devices, the entirety of this Circuit SAIDI budget will be intelligent vacuum circuit reclosers with remote capability. 2015 is projected be the last year of this program as it will be incorporated into the Distribution Automation Deployment program in 2016.

Distribution Automation Deployment

Program Description and Purpose

Upgrade existing air breaks, vacuum circuit reclosers ("VCRs"), and SCADA ("Supervisory Control and Data Acquisition") at distribution substations, and identify new locations to install automated air breaks and VCRs to improve circuit reliability. This will allow for automatic sectionalizing and restoration of customers during service outage conditions. This plan meets the recommendation the Commission issued on August 7, 2012 regarding outage mitigation techniques during storm events.

Identification/Justification Process

Areas selected for deployment:

- Have concentrations of distribution feeders that have been identified as WPCs.
- Have the operational flexibility to allow transfers and restoration of customers when service outages occur.
- Have significantly contributed to system SAIDI and SAIFI.

Customer Benefits:

- 500,000 customers (36%) will be covered under the distribution automation deployment.
- Significant reductions in system SAIDI and SAIFI.
- Reduction of the number of customers experiencing long duration service interruptions. Distribution automation will sectionalize the service interruption to the smallest possible area in under five minutes.
- Major Event improvements:
    - Fewer resources needed for switching (trouble crews can focus on cutting loops and performing repairs).
    - Reduction in call volume due to automatic restoration of customers.

Approximately 16-28 distribution substations will be upgraded per year and approximately 223-532 distribution devices will be upgraded per year.

PPL Electric Utilities Corporation

Scope

Substation Upgrades	Voltage	2014	2015
Original LTIIP	**138/69-12 kV**	17	24
Future YR Adjusted / Current YR Actual	**138/69-12 kV**	**0**/ 0	**0**

Device Upgrades	Voltage	2014	2015
Original LTIIP	**12 kV**	275-295	350-375
Future YR Adjusted / Current YR Actual	**12 kV**	**375-400**/ 357	**550-600**

Distribution devices include air break switch upgrades, VCR upgrades/installations, and (in 2013) communication infrastructure.

Locations

Region	2014 Actual
Lehigh	0
Northeast	0
Central	0
Susquehanna	0
Harrisburg	0
Lancaster	0

Region	2014 Actual
Lehigh	167
Northeast	22
Central	32
Susquehanna	36
Harrisburg	32
Lancaster	68

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$14.73M	$21.29M
Future YR Adjusted / Current YR Actual	**$14.80M**/ $17.22M	**$23.40M**

Comments:

The increase in cost of the devices drove the budget up for this program. Work to install these devices may also include the upgrade of the pole on which the device is being installed in order to accommodate the device.

Substation upgrades are done on a per-needed basis, where larger substation upgrade projects are planned. Currently, there are no projects scheduled for 2015.

Originally, areas selected for deployment were chosen partly on geographic proximity starting specifically in the Northeast and Central regions (due to the range and type of communications infrastructure), and having distribution feeders that were identified as WPCs. Since the Company has changed the communications strategy, it is able to target specific feeders based on reliability history. Over the course of this project, PPL Electric intends to address most of our feeders. The Company intends to make circuit upgrades as necessary to improve the operational flexibility to allow transfers and restoration of customers when service outages occur.

System Reliability Improvement Projects

Program Description and Purpose

Large-scale improvements to distribution circuits with a history of poor reliability. This program addresses long-term projects, primarily aimed at WPCs. However, other proactive long-term projects with proven reliability benefit are included.

Identification/Justification Process

Each quarter, distribution planners and regional reliability supervisors meet to propose projects to improve WPCs. Projects are approved by distribution planning supervisors and vetted against other projects for scheduling based on historical reliability, potential benefit, and cost. Projects may span multiple years and are listed in the years they are planned to go in service. Scope is expected to increase in outer years as circuits and projects are identified. Examples include, but are not limited to, circuit reconfigurations with new tie lines, new lines and terminals, or the installation of substations for increased reliability.

Additionally, PPL Electric monitors large customer impact outages on a daily basis. A circuit that begins to show reliability deterioration and notable impact on reliability metrics requires a root cause analysis. Such analysis can result in the identification of a long-term project.

Note that the projects vary significantly in size, which can result in material swings in the number of planned projects.

Scope

Projects	2014	2015
Original LTIIP	10-20	10-25
Future YR Adjusted / Current YR Actual	**14-20/** 9	**10-15**

Locations

PPL Electric Utilities Corp.

Region	2014 Actual
Lehigh	3
Northeast	3
Central	2
Susquehanna	0
Harrisburg	1
Lancaster	0

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$15.07M	$15.31M
Future YR Adjusted / Current YR Actual	**$16.32M**/ $9.22M	**$9.51M**

Comments:

The program was modified to reprioritize the composition of projects which had a direct impact on the actual and budgeted dollars.

Unreimbursed Highway Relocations

Program Description and Purpose

Unreimbursed customer requested relocations of PPL Electric distribution facilities in support of highway and bridge projects throughout service territory.

Identification/Justification Process

The customers (project sponsors) include PennDOT, the PA Turnpike Commission, and various counties and municipalities. PPL Electric and the project sponsor execute a reimbursement agreement, and PPL Electric is reimbursed for its work based on the "pole count method", as defined in PennDOT's DM-5 manual, although other cost share determinations are used when PPL Electric and PennDOT agree it is more appropriate. Historically, reimbursement for distribution projects is approximately 35%.

To accommodate highway relocations and other municipal projects, approximately 70-120 projects per year are placed in service. PPL Electric typically is notified of distribution relocation work 12 months or less before the start of requested utility relocation activities and construction dates routinely shift as PennDOT's construction schedules move.

PPL Electric Utilities Corporation

Scope & Locations

Scope and locations are determined as requests are received.

Planned Expenditures

PPL Electric's expenditures to complete highway relocation projects are the net of total expenditures minus the project sponsor's reimbursements.

Planned Expenditures	2014	2015
Original LTIIP	$2.96M	$3.05M
Future YR Adjusted / Current YR Actual	**$4.09M**/ $4.42M	**$4.67M**

Comments:

Although 2014's forecast variance decreased somewhat from prior years, the constant changing of PennDOT's construction schedules continues to complicate and create unknowns for forecasts out more than six months. Because PennDOT tends to schedule work two and three years in advance, initial estimates normally precede PPL Electric issuance of engineering design. Additionally, PPL Electric rarely receives complete designs from PennDOT or their contractors during the preliminary engineering design phase which tends to necessitate engineering changes during the project, further complicate forecasting, and increase inaccuracies.

PennDOT recently initiated a "Rapid Bridge Replacement" program across the state that has the potential to add up to 135 relocation efforts across the PPL Electric service territory between 2015 and 2017. Up to 22 of these will occur in 2015, with the remainder spread across the following two years. This coupled with PennDOT's regularly scheduled road work is expected to increase PPL Electric's relocation costs in 2015 and beyond.

Substation Assets

The following pages detail 5-year projections for Long-Term Infrastructure Improvements initiatives that apply to distribution substation assets. These assets includes, but are not limited to, the following:

- Structures
  - Enclosures
  - Fences
- Overhead Conductors and Hardware
- Underground Cables and Hardware
- Switching Devices
  - Air Break Switches
  - Disconnect Switches
- Protective Devices
  - Circuit Breakers
  - Fuses
  - Reclosers
  - Lightning Arresters
- Transformers
  - Power
  - Station Service
  - Instrument

Distribution Substation Circuit Breakers

Program Description and Purpose

Programmatic replacement of substation circuit breakers ("CBs") based on age and other factors to ensure reliable service. This program includes the replacement of 12 kV circuit breakers, as well as 69 kV circuit breakers that are classified as distribution facilities and equipment.

Identification/Justification Process

Candidates for replacement are identified based on age, operating issues, availability of spare/repair parts, and the availability of vendor technical support. Once identified, replacement of these facilities are coordinated and aligned with the replacement of other assets at the same substation within the five-year planning window.

The average age of the 12 kV circuit breakers that have been identified for replacement through 2017 is 48 years; the life expectancy is 50 years.

The specific type of 12 kV circuit breakers that have been targeted in this replacement program are the GE type FKD and FK oil CBs, Allis Chalmers type OZ and FZO oil CBs, Federal Pacific type AF and JCE oil CBs, McGraw Edison type VAC vacuum CBs, IT type VBK vacuum CBs, and GE type VIB vacuum CBs.

The average age of the 69 kV circuit breakers that have been identified for replacement through 2017 is 47 years; the life expectancy is 50 years.

The specific type of 69 kV circuit breakers that have been targeted for replacement in this program are the Allis Chalmers type FZO oil CBs and the GE type FK oil CBs.

Scope

Projects	Voltage	2014	2015
Original LTIIP	12 kV	30-35	32-37
Future YR Adjusted / Current YR Actual		**30-35**/ 27	**30-35**
Original LTIIP	69 kV	0-4	1-5
Future YR Adjusted / Current YR Actual		**0-4**/ 0	**0-4**

Locations

Region	2014 Actuals
Lehigh	3
Northeast	1
Central	13
Susquehanna	3
Harrisburg	0
Lancaster	7

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$3.24M	$4.30M
Future YR Adjusted / Current YR Actual	**$6.33M**/ $6.05M	**$6.79M**

Comments:

Due to downtown development in Allentown, PPL Electric decided to defer 5 circuit breaker (CB) replacements at Allentown Substation to be included in a more comprehensive rebuild of the substation in 2015. In 2014, CB replacement costs increased due to selecting a new standard breaker from a new vendor that provides enhanced reliability.

Substation 69/12 kV Transformer Replacement

Program Description and Purpose

Programmatic replacement of distribution substation transformers to maintain reliable service.

Identification/Justification Process

Candidates for replacement are identified based on age and/or maintenance condition, both indicators of potential failure. Once identified, replacement of these facilities is coordinated and aligned with the replacement of other assets at the same substation within the five-year planning window. Replace approximately 12 per year, averaged over a five-year period.

The average age of assets identified for replacement is 52 years; 14 of these are beyond their expected life. These assets are of vintages between 1947 and 1973, manufactured by Westinghouse, U S Transformer, RTE-Asea, Moloney, Hevi-Duty, General Electric and Allis Chalmers.

PPL Electric Utilities Corporation

Scope

Projects	2014	2015
Original LTIIP	3-7	13-17
Future YR Adjusted / Current YR Actual	**1-3/** 2	**2-3**

Locations

Region	2014 Actual
Lehigh	0
Northeast	2
Central	0
Susquehanna	0
Harrisburg	0
Lancaster	0

Planned Expenditures

Planned expenditures fluctuate due to timing of long lead material purchases.

Planned Expenditures	2014	2015
Original LTIIP	$7.76M	$3.40M
Future YR Adjusted / Current YR Actual	**$2.58M/** $2.74M	**$4.13M**

Comments:

PPL Electric has adopted a system wide design standard for new substations. As transformers are evaluated for replacement, PPL Electric will determine if the substation should be upgraded to this design standard. This design standard provides increased reliability for customers. In 2014, transformer projects were deferred to bundle the transformer replacements with the substation upgrade.

2014 work performed was much more involved than originally expected due to unique configurations, resulting in an increase in expenditures needed to support the replacements.

Protection and Control

Program Description and Purpose

Programmatic replacement of protection and control equipment to maintain reliable distribution service to customers. Replacement of relays with modern microprocessor relays will enhance the ability for self-diagnostics, as well as continuous monitoring of the health of the device.

Identification/Justification Process

Candidates for replacement are identified based on obsolescence, availability of vendor support, and age. Once identified, replacement of these facilities is coordinated and aligned with the replacement of other assets at the same substation within the five-year planning window. The specific type of relays that have been targeted for early replacement in this program are the Agastat 2400 Series, Westinghouse COI, General Electric IAC, General Electric CFF, General Electric NLR, ABB DPU 245/445, and Westinghouse COM.

Projects	2014	2015
Original LTIIP	5-8	5-8
Future YR Adjusted / Current YR Actual	**5-8**/ 2	**3-6**

Locations

Region	2014 Actual
Lehigh	0
Northeast	0
Central	0
Susquehanna	0
Harrisburg	0
Lancaster	2

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$.88M	$1.00M
Future YR Adjusted / Current YR Actual	**$.55M**/$.26M	**$1.17M**

Comments:

In this program, work can vary in size and scale. In 2014, three projects were deferred after replacement prioritization was refocused to specifically target model DPU-2000 relays.

Cross-Yard 12 kV Underground Ties

Program Description and Purpose

Programmatic replacement of underground substation cables to maintain reliable service.

Identification/Justification Process

Candidates for replacement are identified based on age and/or maintenance condition, both indicators of potential failure. Assets with an age significantly greater than 29 years are deemed good candidates for replacements. In addition, assets with unfavorable test results, which indicate the likelihood of failure, are prioritized for replacement. Currently, there is an average of 23 replaced per year over a five-year period. The average age of assets identified for replacement is 40 years. These assets were installed between 1960 and 1989; 85 of these assets are over 40 years old.

Scope

Projects	2014	2015
Original LTIIP	15-25	15-25
Future YR Adjusted / Current YR Actual	**15-25**/ 12	**20-30**

Locations

Region	2014 Actual
Lehigh	3
Northeast	0
Central	2
Susquehanna	3
Harrisburg	0
Lancaster	0

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$1.06M	$1.09M
Future YR Adjusted / Current YR Actual	**$.92M**/ $1.28M	**$1.47M**

Comments:

In 2014, the completed work was larger and more involved projects than anticipated, leading to cost overruns. As a consequence of the depleted budget, some work was also deferred.

Replace Deteriorated/Failed Area Supply Substation Equipment

Program Description and Purpose

Replacement of failed or deteriorated equipment at area supply substations with in-kind equipment to maintain safe and reliable service.

Identification/Justification Process

Candidates are identified via actual failures, inspections, testing or work on the system. Budget recommendations are based on historical trends of hours charged to corrective work, in addition to projected trends of future equipment failures.

Scope & Locations

Scope and locations are determined as equipment fails.

Planned Expenditures

Planned Expenditures	**2014**	**2015**
Original LTIIP	$1.09M	$1.12M
Future YR Adjusted / Current YR Actual	**$1.93M**/ $5.05M	**$2.10M**

Comments:

PPL Electric has experienced increased failure rates of miscellaneous substation equipment in 2014, attributed primarily to aging components. This trend may likely continue in 2015. However, in response, PPL Electric began an extensive, top-to-bottom substation condition review program to proactively identify ailing equipment and replace prior to failure.

Repair Failed 138/69/12 kV Transformers

Program Description and Purpose

Repair of failed distribution substation power transformers to “like new” condition to maintain safe and reliable service in a more cost-effective manner than the purchase of new units. Program only includes costs associated with the overhaul of the failed unit.

Identification/Justification Process

Budget projections include a failure rate of three transformers per year based upon a ten-year rolling average. Individual units are selected based upon the cost-effectiveness of rebuilding the unit when compared to scrapping.

Scope & Locations

Scope and locations are determined as equipment fails.

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$1.10M	$1.14M
Future YR Adjusted / Current YR Actual	**$.33M**/ $0	**$.33M**

Comments:

PPL Electric experienced no transformer failures in 2014. Based on decreased failure trends, the 2015 budget has been reduced to just one transformer per year.

Distribution Substation DC Equipment

Program Description and Purpose

Programmatic replacement of distribution substation DC equipment to maintain reliable service. This program includes the replacement of 24V, and 48V batteries, as well as battery chargers.

Identification/Justification Process

Candidates for replacement are identified based on age, operating issues, and availability of spare parts. Once identified, replacement of these facilities are coordinated and aligned with the replacement of other assets at the same substation within the five-year planning window. Currently, there is an average of 25 pieces of DC equipment scheduled to be replaced per year over the next six-year period. The average age of the DC equipment scheduled to be replaced through 2017 is 31 years; life expectancy of this type of equipment is 20 years. Of the devices being replaced, 96 devices will be beyond their expected life by the time of replacement.

Scope

Projects	2014	2015
Original LTIIP	22-28	22-28
Future YR Adjusted / Current YR Actual	**22-28**/ 23	**22-28**

Locations

Region	2014 Actual
Lehigh	5
Northeast	6
Central	4
Susquehanna	2
Harrisburg	1
Lancaster	5

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$.37M	$.39M
Future YR Adjusted / Current YR Actual	**$.38M**/$.28M	**$.34M**

Comments:

This program was on track based on projections. Projections for 2015 are consistent with original estimates.

Miscellaneous Substation Equipment

Program Description and Purpose

Programmatic replacement of older substation equipment, including air breaks, potential transformers ("PTs"), capacitance-coupled voltage transformers ("CCVTs"), circuit switchers, 120V batteries, lightning arresters, and DC panels in order to prevent future maintenance concerns and to maintain reliable service.

Identification/Justification Process

Candidates for replacement are identified based on age and/or maintenance condition, both indicators of potential failure. Once identified, replacement of these facilities is coordinated and aligned with the replacement of other assets at the same substation within the five-year planning window. Currently, there is an average of 24 pieces of equipment scheduled to be replaced per year over the next six-year period. The average age of assets identified for replacement is 47 years. These assets are of vintages between 1947 and 2000. Approximately 90 of these assets are projected to have exceeded their expected life by the time they are replaced.

Scope

Projects	2014	2015
Original LTIIP	15-20	20-25
Future YR Adjusted / Current YR Actual	**15-20**/ 18	**20-25**

Locations

Region	2014 Actual
Lehigh	4
Northeast	0
Central	8
Susquehanna	1
Harrisburg	3
Lancaster	2

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$1.06M	$1.67M
Future YR Adjusted / Current YR Actual	**$1.11M**/ $1.15M	**$1.49M**

Comments:

This program was on track based on projections. Projections for 2015 are consistent with original estimates.

Substation Animal Guarding

Program Description and Purpose

Improvements to existing distribution substation equipment via the proactive installation of animal guards. Guarded equipment includes transformer bushings, circuit breakers, fuse/disconnect switches, bus supporting insulators, surge arresters, station service transformers, PTs, and cable terminators.

Identification/Justification Process

Distribution substations are regionally prioritized based on historical animal-related service outages, number of customers served, substation load, and substation type. High priority substations are animal guarded first with the lower priority substations guarded in outer years.

Scope

Installations in Units	2014	2015
Original LTIIP	45-55	45-55
Future YR Adjusted / Current YR Actual	**45-55**/ 49	**50-60**

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Locations

Region	2014 Actual
Lehigh	9
Northeast	8
Central	12
Susquehanna	3
Harrisburg	6
Lancaster	11

Planned Expenditures

Planned Expenditures	2014	2015
Original LTIIP	$2.46M	$2.55M
Future YR Adjusted / Current YR Actual	**$2.57M/** $2.81M	**$2.55M**

Comments:

In 2014, PPL Electric continued to refine and update new animal guarding standards to improve guarding effectiveness. The increased materials required combined with the complex switching operations and outage mitigation required resulted in small cost overruns.