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File #: 153362

March 28, 2014

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-2014-

Dear Secretary Chiavetta:

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

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

Respectfully submitted,

Jessica R. Rogers

JRR/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 28, 2014

Jessica R. Rogers

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PPL Electric Utilities Corporation

Annual Asset Optimization Plan

March 2014

Docket No. M-2014-_____

PPL Electric Utilities Corporation

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PPL Electric Utilities Corporation

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 provides:

> (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 first year with an effective LTIIP and DSIC.

Legislative 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 an 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. The Commission invited comments to be filed within 45 days of the date the Order was published in the Pennsylvania Bulletin. The Order was published on October 19, 2013. Comments were filed by interested parties on December 3, 2013. The Commission has not issued a Final Order at Docket No. L-2012-2317274.

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 and Procedural History

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 its 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. The DSIC proceeding is currently pending before the Administrative Law Judge.

Within the LTIIP, PPL Electric categorized its distribution system infrastructure replacement projects 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 a five year period (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 AAO Plan, PPL Electric has included all 32 asset groups originally included in its Commission-approved LTIIP, which are addressed herein on pages 10 through 46. The AAO Plan provides original projections and actual expenditures for 2013, and original and revised projections for 2014. PPL Electric maintained the project description provided in the LTIIP, but has added a comment section 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, PPL Electric has slightly exceeded the original amount it projected to spend on DSIC eligible projects in 2013. The Company anticipates that its actual expenditures will be slightly below the LTIIP projections in 2014. The overage from 2013 is an almost equal offset to the amount below budget in 2014.

Overall, over the two year period, PPL Electric anticipates spending approximately $1.0 million more than the original projections contained in its Commission-approved LTIIP.

Asset Repair/ Upgrade/ Replacement Expenditures				
Infrastructure Initiative	2013 LTIIP	2013 Actuals	2014 LTIIP	2014 Forecast
Distribution Pole Replacements	$6.61	$6.77	$4.00	$8.08
C-Truss Distribution Poles	$1.45	$2.29	$1.54	$2.96
Fiber Wrap Distribution Poles	$3.36	$2.04	$1.58	$2.62
Recloser Replacements	$6.38	$5.13	$5.72	$2.29
Capacitors	$0.24	$0.33	$0.23	$0.24
New Hydraulic Reclosers	$0.81	$0.83	$0.70	$0.71
Distribution Animal Guarding	$1.06	$0.66	$1.50	$0.70
Distribution Failed Equipment	$13.35	$13.15	$13.17	$16.36
Replace Failed Underground Primary Cable	$3.60	$4.33	$3.48	$3.50
Replace Failed Underground Secondary Cable	$1.83	$2.53	$1.90	$3.10
Replace Failed 12kV Underground Getaway Cable	$0.46	$0.87	$0.47	$0.75
Replace Deteriorated/Failed Low-Tension Network Equipment and Structures	$1.46	$1.46	$1.52	$1.23
Underground Residential Development Cable Replacement and Life Extension	$11.54	$9.14	$9.66	$8.81
Low Tension Network Primary Cable, Equipment and Structures	$4.41	$3.68	$8.56	$5.10
12 kV Underground Getaway Cables	$2.72	$2.88	$5.02	$2.37
Copper Weld Copper	$4.97	$2.74	$6.56	$2.65
Customers Experiencing Multiple Interruptions	$4.41	$3.13	$2.37	$3.06
Distribution Reliability Preservation	$10.81	$9.61	$7.39	$10.54
Reliability Preservation Emergent	$1.01	$1.96	$1.13	$1.52
Circuit SAIDI Improvement	$6.54	$7.66	$8.44	$7.00
Distribution Automation Development	$9.99	$12.09	$14.73	$14.80
Improve System Reliability Projects	$13.58	$23.30	$15.07	$13.60
Unreimbursed Highway Relocations	$2.83	$3.98	$2.96	$4.09
Distribution Substation Circuit Breakers	$5.74	$6.09	$3.24	$6.33
Substation 69/12 kV Transformer Replacement	$3.42	$4.27	$7.76	$2.58
Protection and Control	$1.41	$0.58	$0.88	$0.55
Cross-Yard 12 kV Underground Tie	$1.03	$0.35	$1.06	$0.92
Replace Deteriorated/Failed Area Supply Substation Equipment	$1.05	$1.64	$1.09	$1.93
Repair Failed 138/69 12 kV Transformers	$1.07	$0.00	$1.10	$0.33
Distribution Substation DC Equipment	$0.35	$0.20	$0.37	$0.38
Miscellaneous Substation Equipment	$1.93	$2.06	$1.06	$1.11
Substation Animal Guarding	$3.25	$2.26	$2.46	$2.57
Grand Total	**$132.67**	**$137.99**	**$136.72**	**$132.77**

Dollars in Millions

Almost all of the initiatives shown in the table above take advantage of new technologies that did not exist when the associated assets were originally placed into service. 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, have 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.

PPL Electric is undertaking these initiatives in order to ensure reliable service to its customers. 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. 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 better than the PUC benchmark. Historical benchmark performance is illustrated below.

PPL Electric Utilities Corporation

	2009	2010	2011	2012	2013
SAIFI (Benchmark = 0.98; Rolling 12-month Std. = 1.18)	0.885	1.087	1.071	1.076	0.82
CAIDI (Benchmark = 145; Rolling 12-month Std. = 174)	117	135	151	152	108
SAIDI (Benchmark = 142; Rolling 12-month Std. = 205)	104	147	162	164	89
MAIFI	4.994	4.96	5.033	4.11	3.54
Average Number of Customers Served	1,384,072	1,388,192	1,389,884	1,392,408	1,395,325
Number of Sustained Customer Interruptions (Trouble Cases)	17,470	20,081	18,403	16,384	14,400
Number of Customers Affected	1,225,421	1,508,319	1,489,203	1,497,660	1,140,583
Customer Minutes of Interruptions	143,351,898	203,963,698	225,087,897	228,143,195	123,601,330
Number of Customer Momentary Interruptions	6,912,711	6,510,312	6,994,790	5,716,569	4,936,544

Finally, PPL Electric's ongoing LTIIP initiatives require the Company to rely upon a qualified and trained workforce. In order to ensure that PPL Electric has sufficient employee resources to achieve its planned LTIIP activities for 2014, the Company assumed that 40% of the full time equivalent positions would be used for LTIIP-related purposes. PPL Electric utilized this calculation based on its determination that approximately 40% of the capital dollars for distribution operations are being allocated to LTIIP projects. PPL Electric has further allocated these full time equivalent positions between direct PPL Electric (PPL) and contract employees. No further breakdown available at a field/supervisor level. Numbers are for full time equivalent positions only.

YEAR	PPL	Contractor	Total
2013	288	96	384
2014	279	99	378

2014 AAO Plan Details

Distribution Assets

The following pages set forth actual results for calendar year 2013 and revised projections for calendar year 2014. 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	2013	2014
Original LTIIP	900-1200	600-800
Current YR Actual/ Future YR Adjusted	1,316	1300-1500

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	2013	2014
Original LTIIP	$6.61M	$4.00M
Current YR Actual/ Future YR Adjusted	$6.77M	$8.08M

Comments:

In 2013, the rejection rate increased to 6.5%. As PPL Electric cycles through the inspection process, the pole plant population continues to age, increasing the likelihood of a pole decaying to the point of being rejected and, therefore, the rejection rate is expected to increase slightly year over year. The reject rate is expected to level off, but at a higher point than originally anticipated. Also, as fiber wrap was introduced as a new reinforcement technology, the number of poles to receive fiber wrap was expected to reduce the number pole replacements by the same amount. Current data affirms the projections showing the new

technology reinforced an average of 16% of the original reject population, or 1% of the inspected population for 2012 and 2013 combined. However, the increase in reject rate was greater than the reduction of pole replacements due to fiber wrap implementation.

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	2013	2014
Original LTIIP	2800-3200	2800-3200
Current YR Actual/ Future YR Adjusted	4,640	5000-5500

Locations

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

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$1.45M	$1.54M
Current YR Actual/ Future YR Adjusted	$2.29M	$2.96M

Comments:

Due to the increased rejection rate to 6.5% in 2013, the number of pole reinforcements increased at the same rate and it is expected to continue in 2014.

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	2013	2014
Original LTIIP	1600-1900	700-900
Current YR Actual/ Future YR Adjusted	1,195	1000-1200

Locations

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

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$3.36M	$1.58M
Current YR Actual/ Future YR Adjusted	$2.04M	$2.62M

Comments:

This is a new program that was piloted in 2012. The scope projections were based on pole inspection and reinforcement information found in the pilot, and experience from other utilities. In 2013, the scope included the on-going projection plus an expected carry-over number of poles from the pilot period and the current year. After implementation, PPL Electric found that the initial scope projections were low and the Company now expects 1,000 to 1,200 fiber wraps per year, similar to the amount fiber wrapped in 2013. PPL Electric had much less fiber wrap carry-over from the pilot than expected.

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	2013	2014
Original LTIIP	800-1100	700-1000
Current YR Actual/ Future YR Adjusted	700	150-250

Locations

Region	2013
Lehigh	118
Northeast	105
Central	135
Susquehanna	117
Harrisburg	101
Lancaster	124

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$6.38M	$5.72M
Current YR Actual/ Future YR Adjusted	$5.13M	$2.29M

Comments:

In 2013, there were a number of reclosers identified for replacement through this program that were replaced with VCRs as part of the Distribution Automation program. In 2014, this program will only proactively replace three-phase reclosers. Single phase reclosers will not be proactively replaced due to a decreased failure rate, as well as a more strategic focus toward immediate reliability improvements. In

2015, units will be replaced with intelligent vacuum devices on a ten year cycle in order to move to condition-based maintenance and improve reliability. This change was reviewed with Commission 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	2013	2014
Original LTIIP	17-23	17-23
Current YR Actual/ Future YR Adjusted	29	17-23

Locations

Region	2013
Lehigh	7
Northeast	6
Central	4
Susquehanna	8
Harrisburg	1
Lancaster	3

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$.24M	$.23M
Current YR Actual/ Future YR Adjusted	$.33M	$.24M

Comments:

Due to a strategic decision related to reliability late in 2012, additional capacitors were moved into 2013, increasing the scope from the original plan.

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	2013	2014
Original LTIIP	23-27	20-25
Current YR Actual/ Future YR Adjusted	56	35-40

Locations

Region	2013
Lehigh	12
Northeast	9
Central	18
Susquehanna	13
Harrisburg	0
Lancaster	4

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$.81M	$.70M
Current YR Actual/ Future YR Adjusted	$.83M	$.71M

Comments:

The material cost for this program was less than anticipated. Therefore, PPL Electric was able to increase the number of reclosers installed with no increase to the overall cost of the program. This is expected to provide additional single phase sectionalizing to improve reliability.

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	2013	2014
Original LTIIP	30-50	40-60
Current YR Actual/ Future YR Adjusted	78	75-100

Locations

Region	2013
Lehigh	11
Northeast	8
Central	10
Susquehanna	15
Harrisburg	11
Lancaster	23

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$1.06M	$1.50M
Current YR Actual/ Future YR Adjusted	$.66M	$.70M

Comments:

A change in the way the Company managed the work allowed it to address more areas at a reduced cost.

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	2013	2014
Original LTIIP	$13.35M	$13.17M
Current YR Actual/ Future YR Adjusted	$13.15M	$16.36M

Comments:

The budget increased in 2014 to reflect a slight increase in the historical failure rates and to address a reoccurring backlog of work that was identified late in the 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	2013	2014
Original LTIIP	$3.60M	$3.48M
Current YR Actual/ Future YR Adjusted	$4.33M	$3.50M

Comments:

The actual expenditures in 2013 exceeded the planned expenditures due to an increased number of failures. A new program has been initiated to cable cure failed cables to extend the cable lifetime at a lower cost than replacement. This is expected to cause a reduction in this budget over time, because fewer failed cables will be replaced.

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	2013	2014
Original LTIIP	$1.83M	$1.90M
Current YR Actual/ Future YR Adjusted	$2.53M	$3.10M

Comments:

The spending on failed secondary cable replacements was higher than projected in 2013 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 to 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	2013	2014
Original LTIIP	$.46M	$.47M
Current YR Actual/ Future YR Adjusted	$.87M	$.75M

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 number of cable failures in 2013 and, as a result, the budget has been increased in 2014 to address the expected increase in the number of 12KV underground getaway cables that fail an insulation test or under load.

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	2013	2014
Original LTIIP	$1.46M	$1.52M
Current YR Actual/ Future YR Adjusted	$1.46M	$1.23M

Comments:

Due to a more proactive approach to replacements, the expected failure rate is likely to decrease in 2014, resulting in reduction to spending in this program.

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	2013	2014
Original LTIIP	**Replacement After Test**	550-600	350-400
Current YR Actual/ Future YR Adjusted	**Replacement After Test**	478	175-250
Original LTIIP	**Cure**	750-800	750-800
Current YR Actual/ Future YR Adjusted	**Cure**	424	550-600
Original LTIIP	**Proactive Replacement**	250-300	150-200
Current YR Actual/ Future YR Adjusted	**Proactive Replacement**	249	105-125

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$11.54M	$9.66M
Current YR Actual/ Future YR Adjusted	$9.14M	$8.81M

Comments:

The number of segments that were cable cured in 2013 and 2014 was less than the projected number because the scope originally projected included all cables submitted to the cable curing contractor, both those that were able to be cured and those that were not. The actual scope has been revised to show only the cables that were actually cured.

Overall, PPL Electric has decreased the 2014 budget for proactive replacement and curing of cables to provide funding for projects that will provide a greater overall reliability benefit.

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		2013	2014
Original LTIIP	**Lead Cable (miles)**	0	4.75
Current YR Actual/ Future YR Adjusted	**Lead Cable (miles)**	0	1.60
Original LTIIP	***LTN Equipment**	50-70	70-90
Current YR Actual/ Future YR Adjusted	**LTN Equipment**	27	15-20

Locations

Region	2013 Actual
Lehigh	0
Northeast	0
Central	6
Susquehanna	2
Harrisburg	12
Lancaster	7

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$4.41M	$8.56M
Current YR Actual/ Future YR Adjusted	$3.68M	$5.10M

Comments:

The actual spending in 2013 is less than the original projection due to work being deferred in order to meet new LTN standards. The funding in 2014 has been reduced compared to the original plan in order to reallocate funds to other projects that will provide a greater overall reliability benefit.

The lead cable program is planned to replace 4.75 miles. It has been determined to split this into smaller projects due to the time period required for replacements and outage planning. In 2014, PPL Electric plans to replace 1.6 miles of lead cable and the remainder of the lead cable over the next 3 years.

*This program was tracked by number of projects (or Work Orders) as it was concluded the original measurement in the LTIIP could not be accurately tracked in the Company's 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

Replacements in Units	2013	2014
Original LTIIP	25-30	50-55
Current YR Actual/ Future YR Adjusted	23	18-20

Locations

Region	2103 Actual
Lehigh	5
Northeast	4
Central	4
Susquehanna	4
Harrisburg	4
Lancaster	2

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$2.72M	$5.02M
Current YR Actual/ Future YR Adjusted	$2.88M	$2.37M

Comments:

The budget for the proactive replacement of underground getaway cables was reduced for 2014 to provide additional funding for projects that will provide a greater overall 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.

Scope

Projects	2013	2014
Original LTIIP	24-26	31-34
Current YR Actual/ Future YR Adjusted	46	18-22

Locations

Region	2013
Lehigh	15
Northeast	2
Central	12
Susquehanna	9
Harrisburg	5
Lancaster	3

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$4.97M	$6.56M
Current YR Actual/ Future YR Adjusted	$2.74M	$2.65M

Comment:
This program was tracked by number of projects (or Work Orders) as it was concluded the original measurement in the LTIIP could not be accurately 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 segments, which impacted the composite of work (scope and dollars) in each year.

A portion of this budget was reallocated to fund programs that were determined to be of greater value in terms of an overall reliability benefit for the system. No decrease in reliability as a result of deferring these projects is expected.

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	2013	2014
Original LTIIP	10-20	15-35
Current YR Actual/ Future YR Adjusted	31	25-40

Locations

Locations are identified based upon emergent reliability needs.

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$4.41M	$2.37M
Current YR Actual/ Future YR Adjusted	$3.13M	$3.06M

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. In 2013, more projects were completed that fell below the budgeted average.

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	2013	2014
Original LTIIP	150-300	150-300
Current YR Actual/ Future YR Adjusted	416	400-550

Locations

Locations are identified based upon emergent reliability needs.

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$10.81M	$7.39M
Current YR Actual/ Future YR Adjusted	$9.61M	$10.54M

Comments:

For 2014, PPL Electric has 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. Moving these larger projects to standalone projects will allow for a greater number of smaller reliability projects to be completed. Additional funding has been 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	2013	2014
Original LTIIP	$1.01M	$1.13M
Current YR Actual/ Future YR Adjusted	$1.96M	$1.52M

Comments:

PPL Electric experienced more power quality and voltage issues than expected in 2013. This trend is expected to continue in 2014, but not be as significant as in 2013.

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	2013	2014
Original LTIIP	150-300	150-300
Current YR Actual/ Future YR Adjusted	234	150-200

Locations

Region	2013
Lehigh	53
Northeast	24
Central	69
Susquehanna	43
Harrisburg	21
Lancaster	24

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$6.54M	$8.44M
Current YR Actual/ Future YR Adjusted	$7.66M	$7.00M

Comments:

In 2013, PPL Electric installed more reclosers than airbreaks which have a slightly higher cost. This contributed to the additional spending in 2013. In 2014, spend is decreasing as part of the Distribution Automation build out.

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.

Scope

Substation Upgrades	Voltage	2013	2014
Original LTIIP	**138/69-12 kV**	16	17
Current YR Actual/ Future YR Adjusted	**138/69-12 kV**	8	0

Device Upgrades	Voltage	2013	2014
Original LTIIP	**12 kV**	215-230	275-295
Current YR Actual/ Future YR Adjusted	**12 kV**	225	375-400

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

Locations

Region	2013 Actual
Lehigh	0
Northeast	6
Central	2
Susquehanna	0
Harrisburg	0
Lancaster	0

Region	2013 Actual
Lehigh	0
Northeast	203
Central	22
Susquehanna	0
Harrisburg	0
Lancaster	0

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$9.99M	$14.73M
Current YR Actual/ Future YR Adjusted	$12.09M	$14.80M

Comments:

PPL Electric has revised the scope for this program to include: upgrade existing air break switches, vacuum circuit reclosers ("VCRs") , and identify new locations to install VCRs to improve circuit reliability. SCADA upgrades were initially included in this program, but SCADA upgrades are not required as part of this program due to PPL Electric's change in communication strategy. SCADA upgrades will still be made, but as a stand-alone project (not part of the Distribution Automation project). This allows the Company to install more line devices in upcoming years.

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 its 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	2013	2014
Original LTIIP	10-16	10-20
Current YR Actual/ Future YR Adjusted	13	14-20

Locations

Region	2013
Lehigh	2
Northeast	4
Central	3
Susquehanna	2
Harrisburg	0
Lancaster	2

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$13.58M	$15.07M
Current YR Actual/ Future YR Adjusted	$23.30M	$16.32M

Comments:

In 2013, the Company advanced larger projects with a greater reliability impact, causing an increase in the overall spend. The program was modified to reprioritize the composition of projects which had a direct impact on the 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.

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	2013	2014
Original LTIIP	$2.83M	$2.96M
Current YR Actual/ Future YR Adjusted	$3.98M	$4.09M

Comments:

2013 unreimbursed highway relocation amounts exceeded the forecast by over $1M. The variability of PennDOT's construction schedules, and the unknown impact that any specific highway project will have on the Company's facilities, create large unknown variables when forecasting more than six months into the future. PPL Electric rarely receives completed designs from PennDOT during its design process, and engineering changes are often necessary during a project. 20% of PPL Electric's total relocation cost is for design work, which is higher than the average design cost percentage on other projects. PennDOT recently received a budget increase for road work, and it is expected that this will also cause PPL Electric's relocation costs to increase in the outer years.

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	2013	2014
Original LTIIP	12 kV	60-65	30-35
Current YR Actual/ Future YR Adjusted		57	30-35
Original LTIIP	69 kV	0-3	0-4
Current YR Actual/ Future YR Adjusted		0	0-4

Locations

Region	2013
Lehigh	9
Northeast	6
Central	9
Susquehanna	16
Harrisburg	8
Lancaster	9

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$5.74M	$3.24M
Current YR Actual/ Future YR Adjusted	$6.09M	$6.33M

Comments:

Due to downtown development in Allentown, PPL Electric decided to defer 5 CB replacements at Allentown Substation and will include them 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.

Scope

Projects	2013	2014
Original LTIIP	13-17	3-7
Current YR Actual/ Future YR Adjusted	12	1-3

Locations

Region	2013
Lehigh	0
Northeast	0
Central	1
Susquehanna	3
Harrisburg	8
Lancaster	0

Planned Expenditures

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

Planned Expenditures	2013	2014
Original LTIIP	$3.42M	$7.76M
Current YR Actual/ Future YR Adjusted	$4.27M	$2.58M

Comments:

Work performed at a few locations was much more involved than originally expected due to unique configurations resulting in an increase in expenditures needed to support the transformer replacement.

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

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.

Scope

Projects	2013	2014
Original LTIIP	5-8	5-8
Current YR Actual/ Future YR Adjusted	5	5-8

Locations

Region	2013
Lehigh	2
Northeast	0
Central	1
Susquehanna	0
Harrisburg	1
Lancaster	1

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$1.41M	$.88M
Current YR Actual/ Future YR Adjusted	$.58M	$.55M

Comments:

In this program, work can vary in size and scale. In 2013, the completed work was smaller in size than expected. A similar trend is expected in 2014.

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	2013	2014
Original LTIIP	15-25	15-25
Current YR Actual/ Future YR Adjusted	11	15-25

Locations

Region	2013
Lehigh	3
Northeast	0
Central	4
Susquehanna	1
Harrisburg	2
Lancaster	1

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$1.03M	$1.06M
Current YR Actual/ Future YR Adjusted	$.35M	$.92M

Comments:

In 2013, scope was reduced to focus on work with greater overall reliability benefits and address failures, which resulted in reduced expenditures.

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	2013	2014
Original LTIIP	$1.05M	$1.09M
Current YR Actual/ Future YR Adjusted	$1.64M	$1.93M

Comments:

PPL Electric experienced increased failure rates in 2013 and expects this trend to continue in 2014.

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	2013	2014
Original LTIIP	$1.07M	$1.10M
Current YR Actual/ Future YR Adjusted	0	$.33M

Comments:

PPL Electric experienced no transformer failures in 2013. Based on decreased failure trends, the budget was 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	2013	2014
Original LTIIP	22-28	22-28
Current YR Actual/ Future YR Adjusted	25	22-28

Locations

Region	2013
Lehigh	5
Northeast	1
Central	8
Susquehanna	4
Harrisburg	2
Lancaster	5

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$.35M	$.37M
Current YR Actual/ Future YR Adjusted	$.20M	$.38M

Comments:

This program is on track for scope and spend for 2013. Projections for 2014 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	2013	2014
Original LTIIP	30-35	15-20
Current YR Actual/ Future YR Adjusted	29	15-20

Locations

Region	2013
Lehigh	6
Northeast	0
Central	3
Susquehanna	7
Harrisburg	6
Lancaster	6

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$1.93M	$1.06M
Current YR Actual/ Future YR Adjusted	$2.06M	$1.11M

Comments:

This program is on track for scope and spend for 2013. Projections for 2014 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	2013	2014
Original LTIIP	50-60	45-55
Current YR Actual/ Future YR Adjusted	12	45-55

Locations

Region	2013
Lehigh	0
Northeast	0
Central	0
Susquehanna	5
Harrisburg	1
Lancaster	4

Planned Expenditures

Planned Expenditures	2013	2014
Original LTIIP	$3.25M	$2.46M
Current YR Actual/ Future YR Adjusted	$2.26M	$2.57M

Comments:

In 2013, scope was reduced to focus on work with greater overall reliability benefits and to address failures, which resulted in less spend. In 2014, PPL Electric is implementing a new standard for what pieces of equipment are animal guarded in the substation and how it is animal guarded. This change is expected to result in higher material costs.