Ameren Illinois Company d/b/a Ameren Illinois

MODERNIZATION ACTION PLAN

Infrastructure Investment Program

2012-2021

Attachment 2: 2014 Plan

April 1, 2014

Table of Contents

Executive Summary 5

2014 Plan Overview 5

Summary 2014 Plan Scope 7

Infrastructure Improvements 7

Training Facilities 12

Distribution Automation. 13

Advanced Metering Infrastructure (AMI). 15

Volt/Var Optimization 16

Software and Technology Enhancements: 17

Summary 2014 Plan Schedule 18

Summary 2014 Plan Capital Investments 18

Summary 2014 Program Staffing 18

Summary 2014 Plan Units of Work 19

Section 1: Infrastructure Improvement Investments 20

Section 1.A: Replace Primary Distribution Substation Reclosers 20

Section 1.B Substation Animal Protection 24

Section 1.C: Bulk Substation Improvements 28

Section 1.D: Distribution Transformer Reserve. 30

Section 1.E: Tie Line Capacity – Line 6973 34

Section 1.F.: Substation Low Side Auto Transfer 34

Section 1.G: High Voltage Distribution Pole Reinforcement 37

Section 1.H: Replace High Voltage Distribution Breakers 41

Section 1.I: Spacer Cable Program 44

Section 1.J: Rebuild Primary Distribution Lines 48

Section 1.K: Primary Distribution Lines Capacity Additions 52

Section 1.L: Bulk Transformer Outage Mitigation 56

Section 1.M: Rebuild High Voltage Distribution Lines 60

Section 1.N: Expand Bulk Supply Substations 64

Section 1.O: Underground Primary Distribution Cable 66

Section 1.P: System Tie Primary Distribution 70

Section 1.Q: CERT Remediation 74

Section 1.R: Infrastructure Improvement Summary 75

Section 2: Training Facilities 77

Section 2A: Training Facilities 77

Section 3: Distribution Automation Programs 78

Section 3.A: Primary Distribution Automation 78

Section 3.B: Communication Infrastructure 82

Section 3.C: High Voltage Distribution Relaying 86

Section 3.D: Distribution Substation Metering 90

Section 3.E: High Voltage Distribution Automation 92

Section 3.F: Test Bed 96

Section 3.G: Underground Network Modernization 96

Section 3.H: Distribution Automation Summary 100

Section 4: Advanced Metering Infrastructure (AMI) 102

Section 5: Volt/Var Optimization 106

Section 5.A: High Voltage Volt/Var Control 106

Section 5.B. Primary Distribution Volt/Var Control 110

Section 5.C: Volt/Var Optimization Summary 114

Section 6: Software and Technology Enhancements 116

Section 6.A: Advanced Distribution Management System (ADMS) 116

Section 6.B: Replace Distribution Engineering Workstation (DEW) 119

Section 6.C: Software and Technology Enhancements Summary 119

Appendix A: Summary-Level Plan Information 121

Executive Summary

2014 Plan Overview

On January 3, 2012, Ameren Illinois Company ("AIC") filed its proposed performance-based formula rate, Modernization Action Plan - Pricing ("Rate MAP-P"), with the Illinois Commerce Commission ("Commission") pursuant to Section 16-108.5 of the Public Utilities Act ("Act"). The Commission commenced Docket No. 12-0001 to review that filing. In making that filing, AIC confirmed that it elected to become a "participating utility", and committed to undertake the investments described in Section 16-108.5(b) of the Act. Section 16-108.5(b) also calls on AIC, within 60 days of such filing, to submit a plan for satisfying its infrastructure investment program commitments pursuant to subsection (b), which must include a schedule and staffing plan for the current and next calendar year. On March 2, 2012, AIC submitted its original plan for the calendar year 2012, and 2013. For information purposes, annual updates to the infrastructure investment plan are prescribed by the Act.

Accordingly in 2014, AIC submits to the Commission a revised 2014 Infrastructure Investment Program, hereafter referred to as the Plan. The 2014 Plan organizes individual projects under two broad categories of investment (Infrastructure Related and Smart Grid). AIC has further broken these down into six more detailed areas (Infrastructure Improvements, Training Facilities, Distribution Automation, AMI, Volt/Var Optimization, and Software & Technology Enhancements).

Infrastructure Related Investments: This section of the Plan sets forth electric system upgrades, modernization projects, and training facilities. AIC has further broken this down into two subcategories:

A. Infrastructure Improvements

B. Training Facilities

Smart-Grid Related Investments: This section of the Plan describes the Smart Grid electric system upgrades, distribution infrastructure upgrades and modernization of these systems. AIC has further broken this are up into four subcategories.

A. Distribution Automation

B. AMI

C. Volt/Var Optimization

D. Software and Technology Enhancements

The 2014 Plan includes a projected cumulative total of $29.7 million of incremental capital investment and associated expense in electric system upgrades, modernization projects, and training facilities ("Infrastructure Related Investments"). The 2014 Plan also includes a projected cumulative total of $58.9 million of incremental capital investment and associated expense in "Smart Grid" electric system upgrades.

As required by Section 16-108 (b), the total projected $88.6 million of cumulative incremental capital investment under the 2014 Plan will be incremental to AIC's total annual capital investment program, as defined in Section 16-108.5(b). That is, over the course of 2014, AIC will invest a projected cumulative total of at least $88.6 million more capital than a capital investment program that invested at an annual rate defined by AIC's average capital spend for calendar years 2008, 2009, and 2010 as reported in AIC's applicable Federal Energy Regulatory Commission ("FERC") Form 1s.

The information provided within the 2014 Plan contemplates investments that AIC currently proposes to make in 2014 pursuant to Section 16-108.5 of the Act. All investments and amounts shown are subject to revision as AIC refines and adapts its 2014 Plan in light of future analysis, findings, and circumstances.

In the event that Section 16-108.5 becomes inoperative or Rate MAP-P is terminated, then the 2014 Plan, including but not limited to all programs and investments, will also become inoperative and terminate immediately, which is permitted by law.

Summary 2014 Plan Scope

Infrastructure Improvements

These programs are described in Section 1 and include, but are not limited to, the following specific programs. A brief overview of each program is described below, with a detailed description of each in Section 1.

A. **Replace Primary Substation Distribution Reclosers.** This program is projected to replace thirty-eight primary distribution substation reclosers in 2014. These three phase oil reclosers or breakers will be replaced with modern single phase vacuum tripping devices. This work will provide reduced outages during single phase faults and modern relaying will provide tighter coordination and fault locating capabilities. Engineering will also commence in 2014 for future projects.

B. **Substation Animal Protection.** This program is to install electric animal resistant fences around susceptible equipment inside substations. In 2014, AIC projects to complete ten substation animal protection projects. Engineering will also commence in 2014 for future projects.

C. **Bulk Substation Improvements.** This program involves improving designated bulk supply substations to minimize large double bus outages due to a single contingency equipment failure Engineering will commence in 2014 for future projects.

D. **Distribution Substation Transformer Reserve.** This program will add distribution substation transformer reserve to select substations by adding a second transformer, upgrading transformers in a two unit station, re-enforcing existing distribution feeder ties, and/or constructing new distribution feeder ties. In 2014, AIC will complete two Distribution Substation Transformer Reserve Projects. Engineering will also commence in 2014 for 2015/16 projects.

E. **Ties Capacity – Line 6973**. This program will implement system upgrades needed to provide a reserve tie or loop feed with 69 kV high voltage distribution Line 6973, which is presently a radial line serving a peak load of roughly 42 MVA. This line originates at the Bush substation and serves the following substations: Morton-Cat, North Morton, Central, Southwood, Tazewell, Mindale, Armington, Burt, and Corn Belt Hoopdale. The scope of work required may include building a new bulk supply substation or expanding an existing substation and constructing /reconductoring several miles of new 69 kV line. Engineering and investment for this program is projected to commence in 2015.

F. **Substation Low Side Auto Transfer.** This program will add low side 12KV transformers and tie breakers to allow automatic low side transfer in some larger distribution substations with two or more transformers. AIC has over 150 substations 34 or 69KV high side, > 10.0 MVA with more than one transformer. A large percentage of these stations have no automatic transfer to the alternate transformer and bus in the event of a transformer or arrester fault. Most existing stations have the physical room for the additional breakers. Engineering will commence in this program in 2014 for future projects

G. **High Voltage Distribution Pole Reinforcement.** This program provides for the replacement of select wood poles with high strength poles, installation of additional high strength poles, or reinforcement of select wood poles on high voltage distribution lines. Hardening these select high voltage distribution lines will limit the likelihood of cascading failures due to extreme transverse loading. Two hundred and forty poles are projected to be replaced/installed under this program in 2014. Engineering will also commence in 2014 for future projects.

H. **Replace High Voltage Distribution Breakers.** This program replaces aging high voltage distribution breakers. Engineering will commence for this program in 2014 for future projects.

I. **Spacer Cable Program.** This program entails the replacement of designated primary distribution spacer cable. There are approximately nine miles of spacer cable projected to be replaced in 2014. Engineering will also commence in 2014 for future projects.

J. **Rebuild Primary Distribution Lines.** This program plans to rebuild and/or reconductor primary distribution circuits. Lines or portions of lines would be selected based on reliability history, customer counts, and system improvement possibilities. In 2014, AIC projects to rebuild approximately eighteen miles of primary distribution under this program. Engineering will also commence in 2014 for future projects.

K. **Primary Distribution Line Capacity Additions.** This program is designed to rebuild existing lines for additional capacity, or build new lines to split existing loads. In 2014, AIC projects to add additional capacity on four primary distribution circuits under this program. Engineering will also commence in 2014 for future projects.

L. **Bulk Transformer Outage Mitigation.** The program is to provide system reinforcements by installing a second bulk supply transformer, building a new bulk supply substation, or reconductoring high voltage distribution lines to provide the system redundancy required to facilitate system maintenance and avoid load curtailments during a bulk substation transformer outage. In 2014 AIC projects to complete one project under this program. Engineering will also commence for future projects.

M. Rebuild High Voltage Distribution Lines. The objective of this program is to rebuild and/or reconductor high voltage distribution lines. Factors such as pole/structure condition, deteriorated conductor, static wire condition, accessibility for repairs, line loading relative to thermal limits, and outage history will be considered in selecting and prioritizing the high voltage distribution lines to reconductor or rebuild. In many cases, the scope of work may be limited to a portion of a line or targeted to address a specific reliability concern such as pole failures or lightning related outages. There are approximately twelve miles of high voltage distribution line rebuild planned for 2014. Engineering will also commence for future projects.

N. Expanded Bulk Supply Substations. This program will construct new bulk supply substations (e.g., 161/69 kV, 138/69 kV, and 138/34.5 kV), or install new bulk supply transformers at existing substation locations, and implement associated line and equipment reinforcements. Construction will commence on two projects in 2014. Engineering will also commence in 2014 for future projects.

O. Underground Primary Distribution Cable. This program is designed to replace or remediate through injection, select primary underground cable. In 2014, AIC projects to replace or inject approximately thirty-four miles of primary underground cable. Engineering will commence in 2014 for future projects.

P. System Tie Primary Distribution. This program plans to build or reconductor primary distribution circuits to be able to tie adjacent circuits together for better operating efficiency and reliability. In 2014, AIC projects to complete eight projects under this program. Engineering will commence in 2014 for future projects.

Q. CERT Remediation. This program specifically targets existing and potential Customers Exceeding Service Reliability Targets (CERT) for remediation each year. There is no planned investment in this program for 2014.

Training Facilities

This program provided for the purchase and renovation of a training facility in the Belleville area to facilitate electric, relay, and smart grid training. The facility consists of indoor and outdoor training space that provides state of the art classroom facilities in addition to hands-on training with physical equipment. This program also included enhancements to our current electric training facility in Decatur as well as the purchase of additional office space required to assist in accommodating a portion of the staffing needs set out in the bill. A more detailed description of this program including scope, schedule, capital expenditures, and staffing are included in Section 2 of this document. There are no additional planned investments under this program in 2014.

Distribution Automation.

These programs are described in Section 3 and include the following programs. A brief overview of each program is shown below, with a detailed description of each set forth in Section 3.

A. **Primary Distribution Automation -** This program will install both line and substation primary distribution level automation schemes to promote automatic fault isolation and service restoration. For 2014 there are forty-nine primary distribution automation projects projected. Engineering will also commence in 2014 for future projects.

B. **Communication Infrastructure** – This program is designed to build the communication infrastructure to support Smart Grid devices and functions. It is considered an enabling program for other projects so units are not tracked. In 2014 the communication infrastructure will be extended to support the 2014 Smart Grid projects. Engineering will also commence in 2014 for future distribution automation project support.

C. **High Voltage Distribution Relaying.** This program is designed for replacement of select electro-mechanical relays with microprocessor based relays on AIC's high voltage distribution system. Benefits include enhanced coordination opportunities and fault location capabilities. There are twenty-four relay terminals projected to be replaced in 2014. Engineering will also commence in 2014 for future projects.

D. **Distribution Substation Metering**. This program adds distribution substation transformer and circuit load metering that will remotely read and report. Engineering will commence for future projects.

E. **High Voltage Distribution Automation.** This program is designed to install smart switching devices on select high voltage distribution lines and place strategically located Fault Circuit Indicators (FCI) to facilitate fault isolation and faster restoration of service to the remaining load. In 2014, there are thirteen High Voltage Distribution Automation projects projected to be completed.. Engineering will also commence on future projects.

F. **Underground Network Modernization -** This program is to replace the 1950 vintage network protectors with modern solid state network protectors. The new protectors will have SCADA remote communication and monitoring capabilities. This will ensure the safe isolation of network faults and allow for maintenance without time consuming switching or arc flash mitigation. There are twenty-seven network protectors projected to be replaced in 2014. Engineering will also commence on future projects.

G. **Smart Grid Test Bed -** The intent of this Smart Grid Test Bed program is to establish the necessary infrastructure, processes, and resources to implement the Smart Grid Test Bed requirements of the Act. The Test Bed provides applicants the opportunity to test Smart Grid related equipment, services and business models within a utility scale environment. Applicants are allowed to have equipment connected to the utility grid for the purpose of demonstrating that the equipment or systems function as designed. The Test Bed will validate applicant sponsored business models or services by testing the functional aspects of specific equipment or verification that services/business models provide the intended results based upon the applicants proposals. The Smart Grid Test Bed program also established the necessary

infrastructure to perform AIC sponsored testing of electric distribution system equipment. There are no planned investments in this program in 2014.

Advanced Metering Infrastructure (AMI).

A brief overview of this program is described below, with a more detailed description set forth in Section 4.

A. AMI. This program involves the planned replacement of 62% of the retail electric meters on the AIC distribution system with Advanced Meters. This program include deployment of an Advanced Metering Infrastructure ("AMI"), which provides a two-way communications infrastructure to support the metering functions and other customer service applications such as remote disconnect. Expected benefits include reductions in projected bills, unaccounted for energy, and consumption on inactive meters. Deployment of Advanced Meters will occur pursuant to the most current Advanced Metering Infrastructure Deployment Plan ("AMI Plan") filed with the ICC.

Volt/Var Optimization.

These programs are described in Section 5 and include, but are not limited to, the following specific programs. A brief overview of each program is shown below, with a detailed description of each set forth in Section 5.

A. **High Voltage Volt/Var Control.** This program is to facilitate dynamic voltage control and optimal reactive power flow on the high voltage distribution system. Generally this involves installing remote switching capability and control on bulk supply transformers load tap changers (LTC's), switching capacitor banks, and controlling bulk supply voltage regulators using a computerized technology solution. The initial focus is to ensure all switch high voltage distribution capacitor banks have SCADA control and voltage indication. There are eighteen projects projected to be completed in 2014 under this program. Engineering will also commence for future projects.

B. **Primary Distribution Volt/Var Control.** This program is intended to provide dynamic voltage control and optimal reactive power flow on select primary distribution circuits. This technique will be applied at the primary distribution level by controlling transformer load tap changers (LTCs), switching capacitor banks, and controlling voltage regulators using a computerized technology solution. This will require the addition of SCADA at each LTC, voltage regulator, and switched capacitor bank location. Expected benefits include reduced system losses and/or reduced customer energy consumption due to a lower delivery voltage via a tighter control on the voltage bandwidth. There are two projects projected to be completed

under this program in 2014. Engineering will also commence in 2014 for future projects.

Software and Technology Enhancements:

These programs are described in Section 6 and include, but are not limited to, the following specific programs. A brief overview of each program is shown below, with a detailed description set forth in Section 6.

A. **Advanced Distribution Management System (ADMS).** AIC is implementing an ADMS in order to replace its existing Distribution SCADA System (DDOS) and its Outage Analysis System (OAS). The ADMS system will be a fully integrated suite of applications that will provide distribution system operators with a common user interface to monitor, control, and manage the electric distribution system and smart devices throughout the distribution system. Phase three of this program began in 2012 and consisted of a three cycle implementation. The SCADA portion was implemented in the 3rd quarter of 2012, the DMS mapping was implemented in 4th quarter of 2012 with additional DMS functionality implemented in the 2nd quarter of 2013. The outage/mobile portion is anticipated in mid-2014.

B. **DEW Replacement.** This project is to replace the current engineering analysis tool which is called Distribution Engineering Workstation (DEW). This tool has limitations related to circuit balancing, capacitor bank placements, and voltage drop calculations. Replacement with a state of the art engineering analysis tool will effectively enable implementation of many of the smart grid programs which require distribution engineering analysis as part of the proposed project design. There are no planned investments in this program in 2014.

Summary 2014 Plan Schedule

The program schedule explains the planned flow of work within each program over the course of the year. Each schedule represents an annual work plan containing a high level task list. It is recognized that scope priorities will be adjusted over the course of the year as new information is obtained. Note that 2014 is considered a ramp-up year for some of the programs. Detailed 2014 planned schedules for specific program areas are provided in the sections that follow.

Summary 2014 Plan Capital Investments

The program capital projection identifies the planned monthly capital cost for each program. The 2014 Plan investment total is projected to be $88.6 million in incremental capital investments plus associated expense.

Summary 2014 Program Staffing

AIC will calculate FTEs in accordance with Appendix A of the revised Modernization Action Plan, Infrastructure Investment, 2012-2021 submittal for 2014.

Summary 2014 Plan Units of Work

The program quantity of units describes the projected number of work units, where applicable, that are planned to be completed in 2014 for each program area. Units of work for each program are discussed, as applicable, in that program's respective section of the Plan.

Section 1: Infrastructure Improvement Investments

Section 1.A: Replace Primary Distribution Substation Reclosers

1.A.1: 2014 Program Scope

Replacement of select three phase hydraulic reclosers or breakers with single phase vacuum devices with modern relaying is expected to reduce CI by isolating single phase faults rather than tripping all three phases. Replacement of the older hydraulic reclosers or breakers is also expected to reduce the failure rate and reduce future maintenance expenditures.

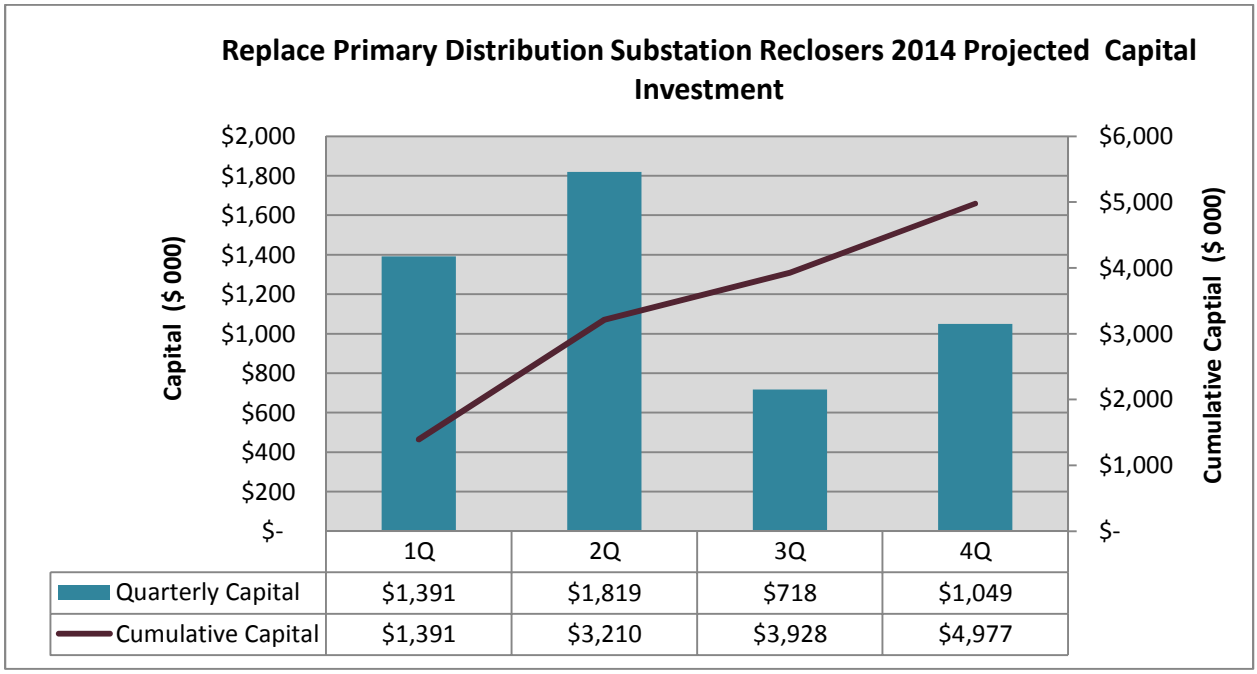
The breakers were generally selected on the basis of:

1. Greatest number of customers
2. Single phase tripping acceptability
3. Criticality of load
4. Maintenance history of recloser
5. Fault duty
6. Upcoming scheduled recloser maintenance
7. Workload management

1.A.2: 2014 Program Capital Investments

Figure 1.A.2 represents the projected capital investment for this program in 2014. AIC estimates the 2014 program cost to be $5.0 million plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

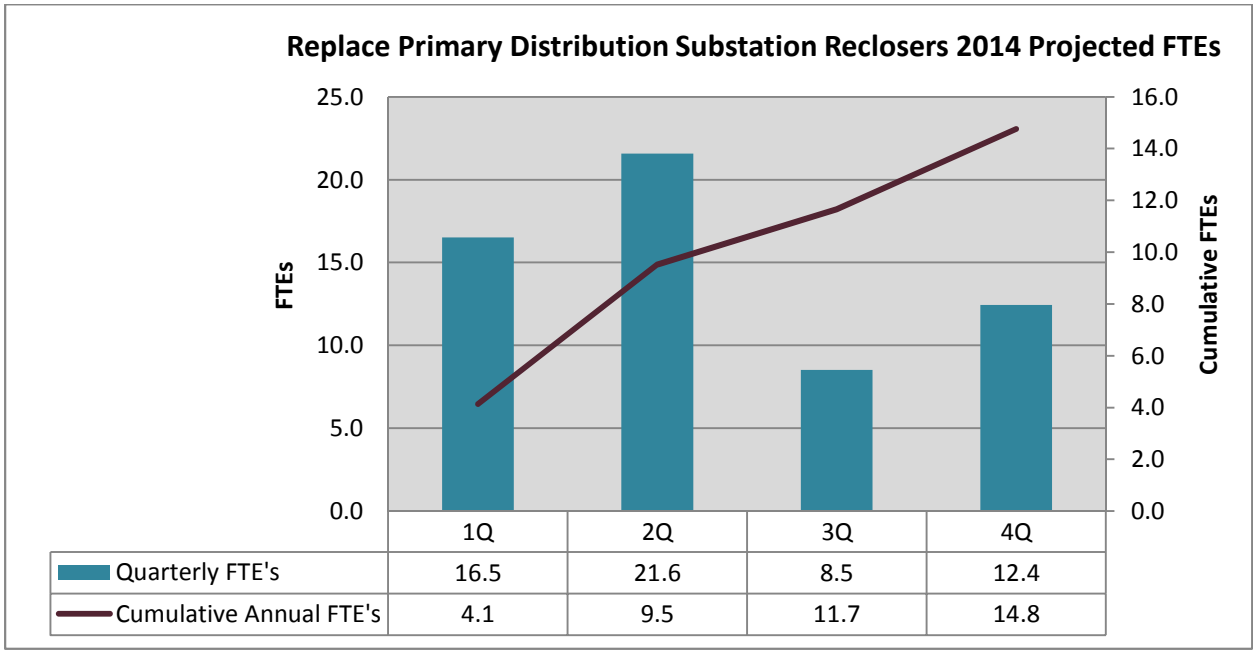
Figure 1A.2: Replace Primary Distribution Substation Reclosers 2014 Capital Investments



1.A.3: 2014 Program FTEs

Figure 1.A.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision, and craft.

Figure 1.A.3: Replace Primary Distribution Substation Reclosers 2014 FTEs

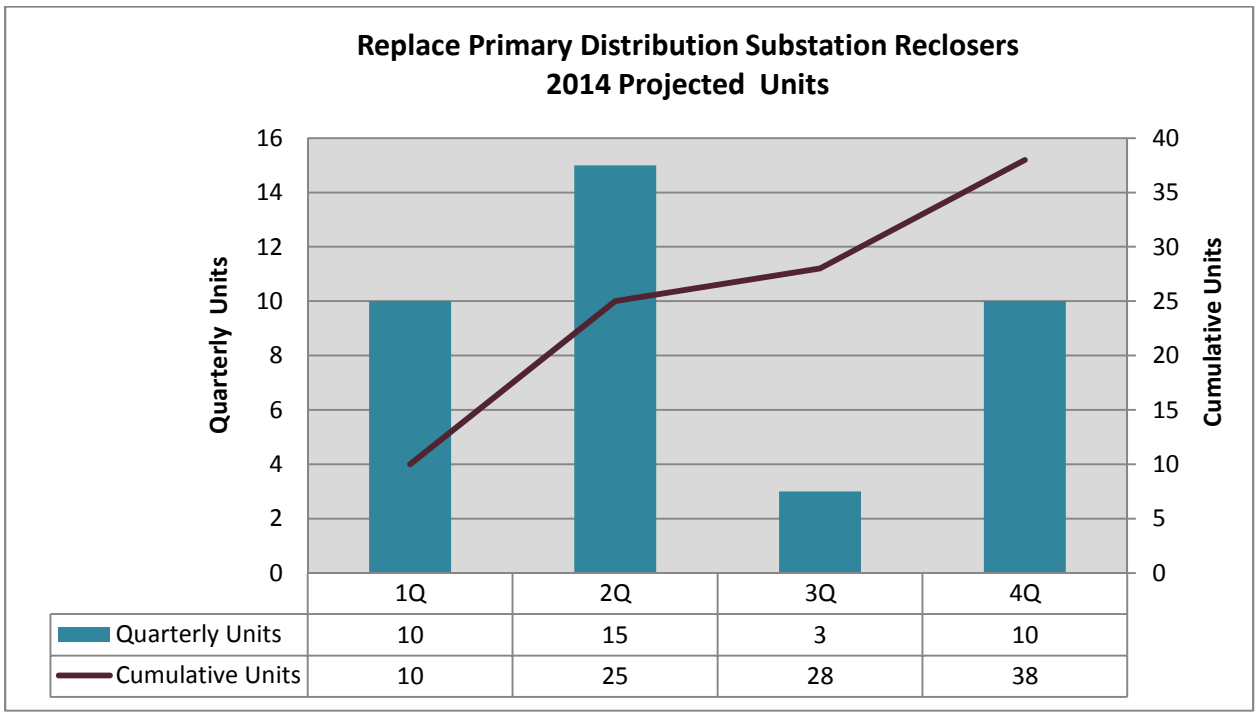


	1Q	2Q	3Q	4Q
Quarterly FTE's	16.5	21.6	8.5	12.4
Cumulative Annual FTE's	4.1	9.5	11.7	14.8

1.A.4: 2014 Program Schedule/Units

Figure 1.A.4 shows the number of reclosers projected to be installed under this program in 2014. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished, as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time.

Figure 1.A.4: Replace Primary Distribution Substation Reclosers



Section 1.B Substation Animal Protection

1.B.1: 2014 Program Scope

This program is to install animal protection for the designated substations by the installation of electrical or passive animal fences to mitigate animal caused substation outages. Passive fences are used where the substations have insufficient room for an electric fence to be located safely between the equipment and the safety fence.

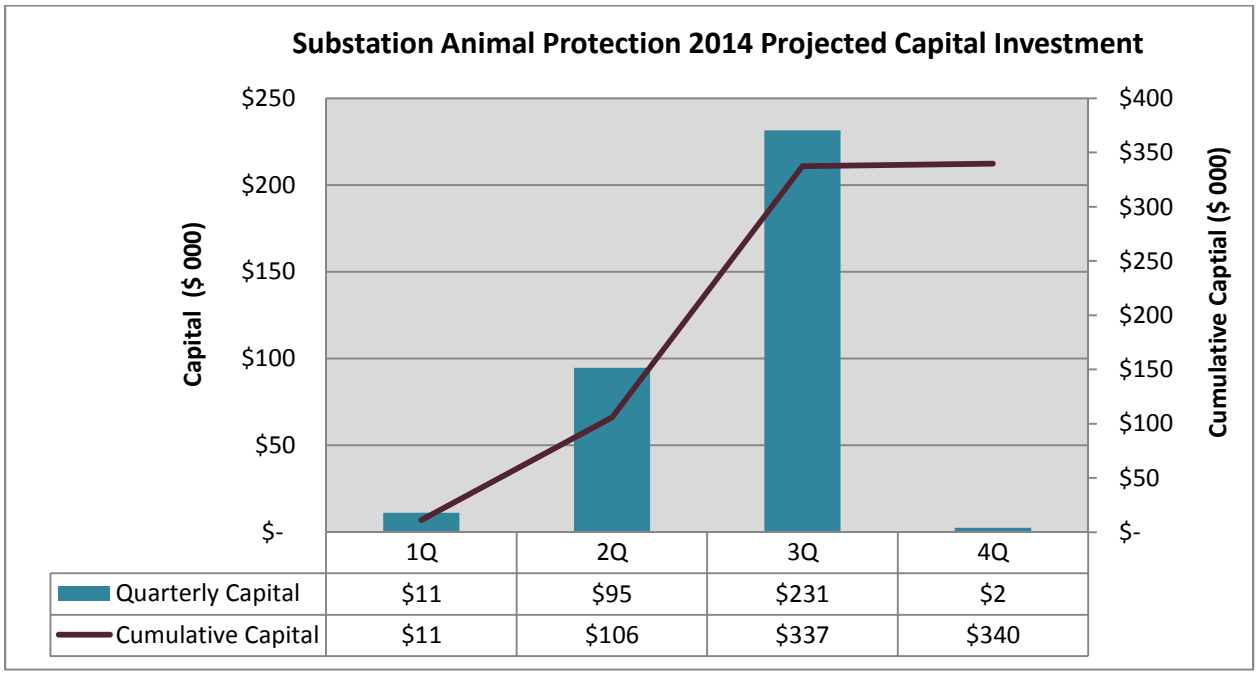
The substations to have animal fences installed were generally selected by the following criteria:

1. Greatest number of customers.
2. Criticality of the load
3. Outage history
4. Site evaluation
5. Workload management

1.B.2: 2014 Program Capital Investments

Figure 1.B.2 represents the projected capital investment for this program in 2014. AIC estimates the 2014 program cost to be $340,000 in capital investment, plus associated expenses. Estimates of cost, units of work and schedules for that work may evolve over time.

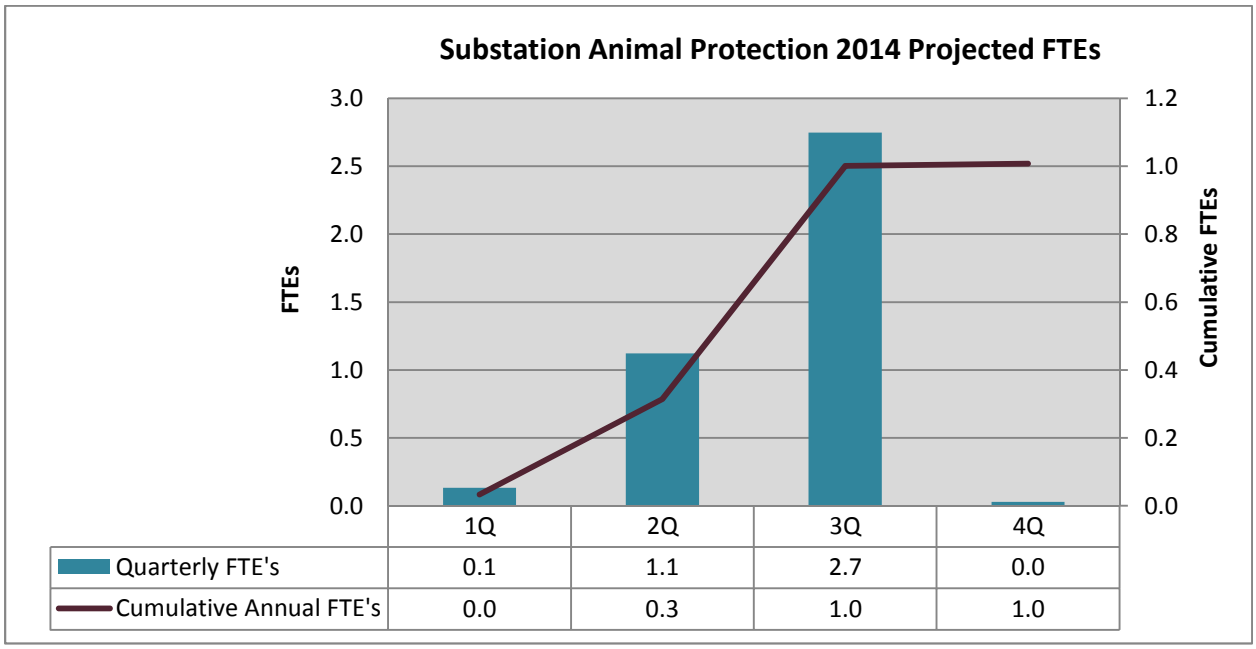
Figure 1.B.2: Substation Animal Protection 2014 Capital Investments



1.B.3: 2014 Program FTEs

Figure 1.B.3 represents the projected FTEs required to perform the scheduled scope of work under this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision, and craft.

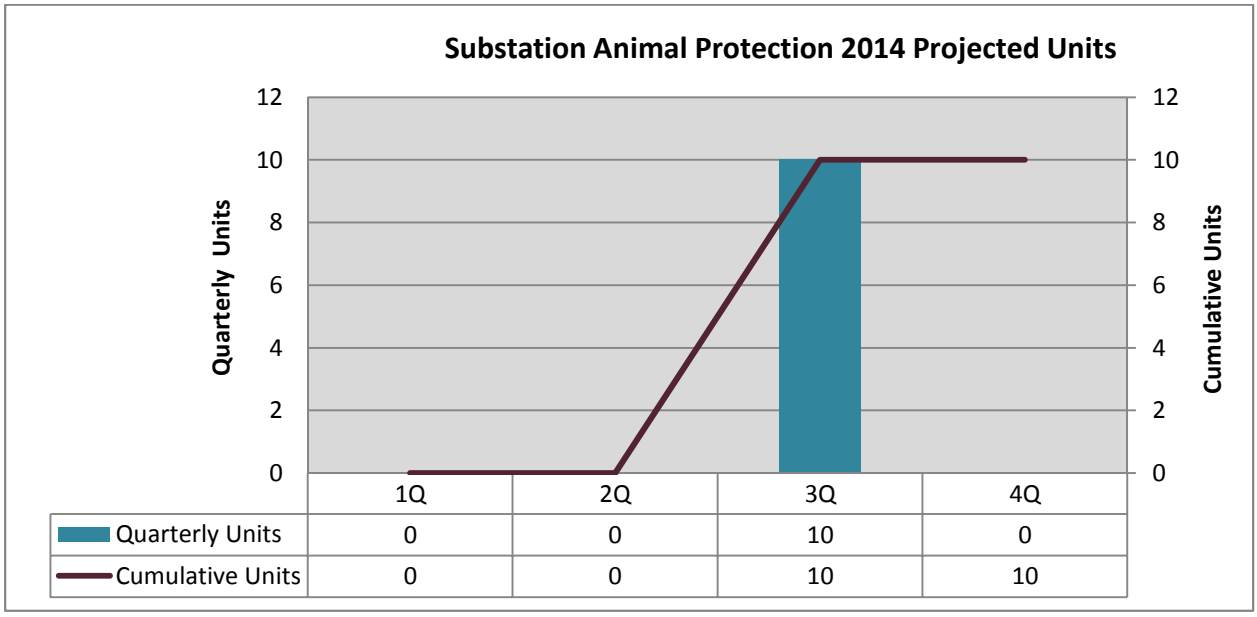
Figure 1.B.3: Substation Animal Protection 2014 FTEs



1.B.4: Program Units/Schedule

Figure 1.B.4 shows the projected number of substations protected under this program in 2014. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished, as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time.

Figure 1.B.4: Substation Animal Protection 2014 Units



	1Q	2Q	3Q	4Q
Quarterly Units	0	0	10	0
Cumulative Units	0	0	10	10

Section 1.C: Bulk Substation Improvements

1.C.1: 2014 Program Scope

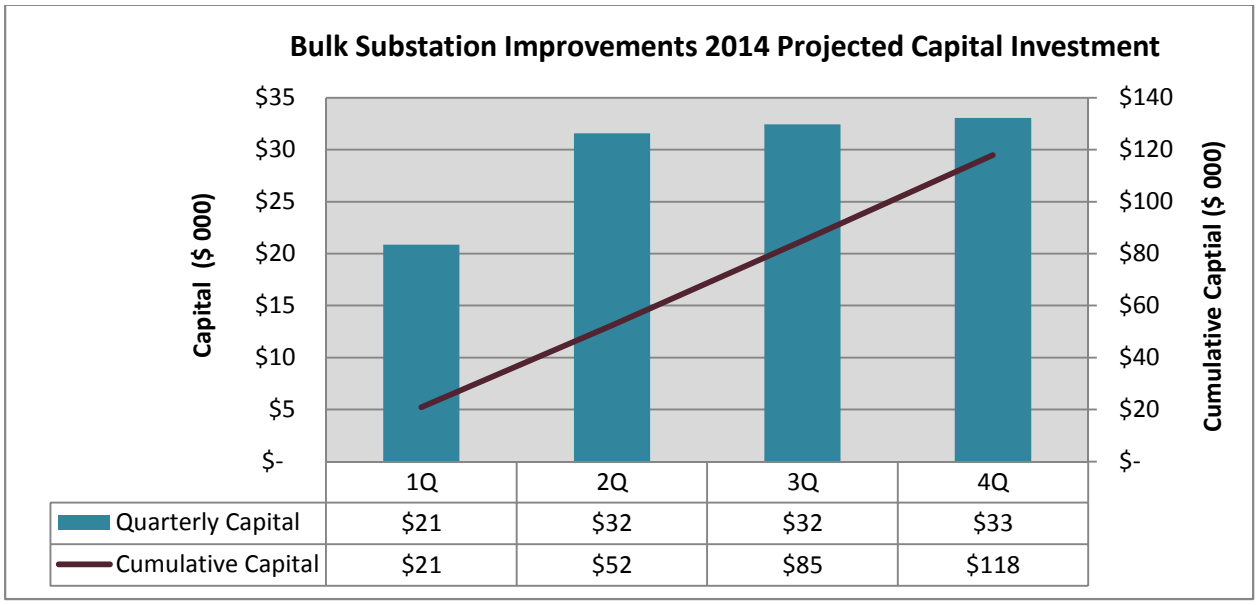
This program involves improving designated bulk supply substations to minimize large double bus outages due to a single contingency equipment failure. Projects were generally selected based on the following criteria.

1. Criticality of load.
2. Number of connected customers.
3. Improvements in operating flexibility.

1.C.2: 2014 Program Capital Investments

Figure 1.C.2 represents the projected 2014 capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $118,000 in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

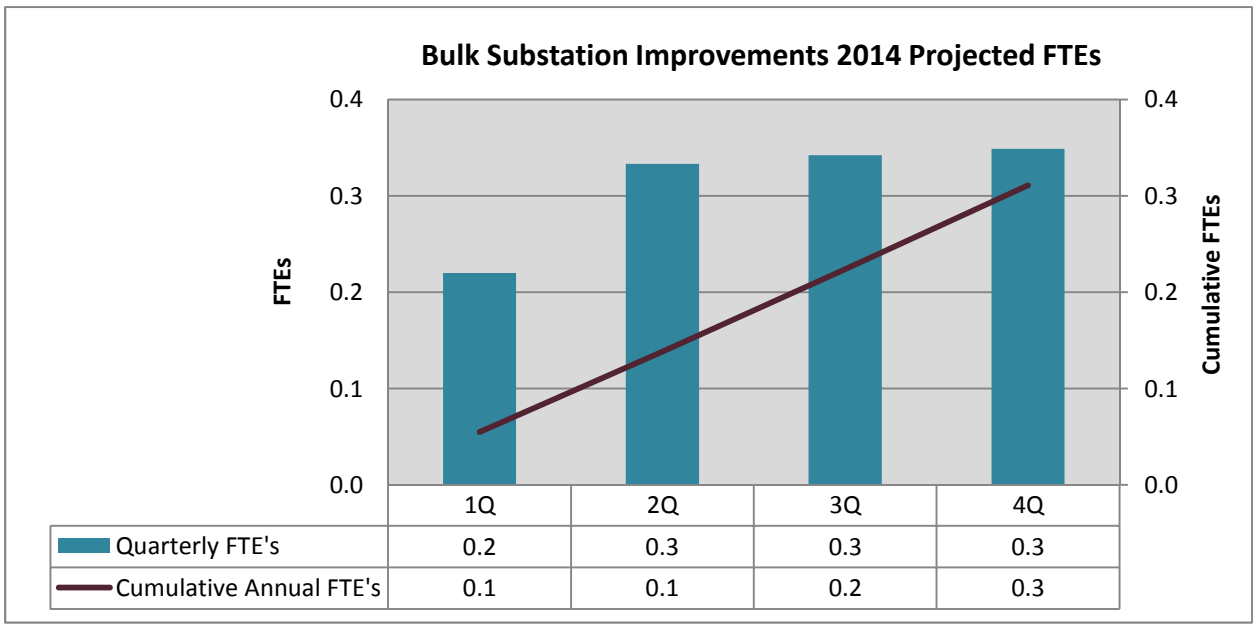
Figure 1.C.2: Bulk Substation Improvements 2014 Capital Investment



1.C.3: 2014 Program FTEs

Figure 1.C.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.C.3: Bulk Substation Improvements 2014 FTEs



	1Q	2Q	3Q	4Q
Quarterly FTE's	0.2	0.3	0.3	0.3
Cumulative Annual FTE's	0.1	0.1	0.2	0.3

1.C.4: Program Units/Schedule

The investment under this program in 2014 is for engineering only. No units will be installed.

Section 1.D: Distribution Transformer Reserve.

1.D.1: 2014 Program Scope

This program will add distribution substation transformer reserve to select substations by, but not limited to, a combination of the following.

1. Adding a second transformer
2. Upgrading transformers in multi-unit substations.
3. Re-enforcing existing distribution feeder ties.
4. Constructing new distribution feeder ties.

Expected benefits include, but are not limited to, reduced outages during a single transformer protection zone fault and increased operating flexibility to perform maintenance functions.

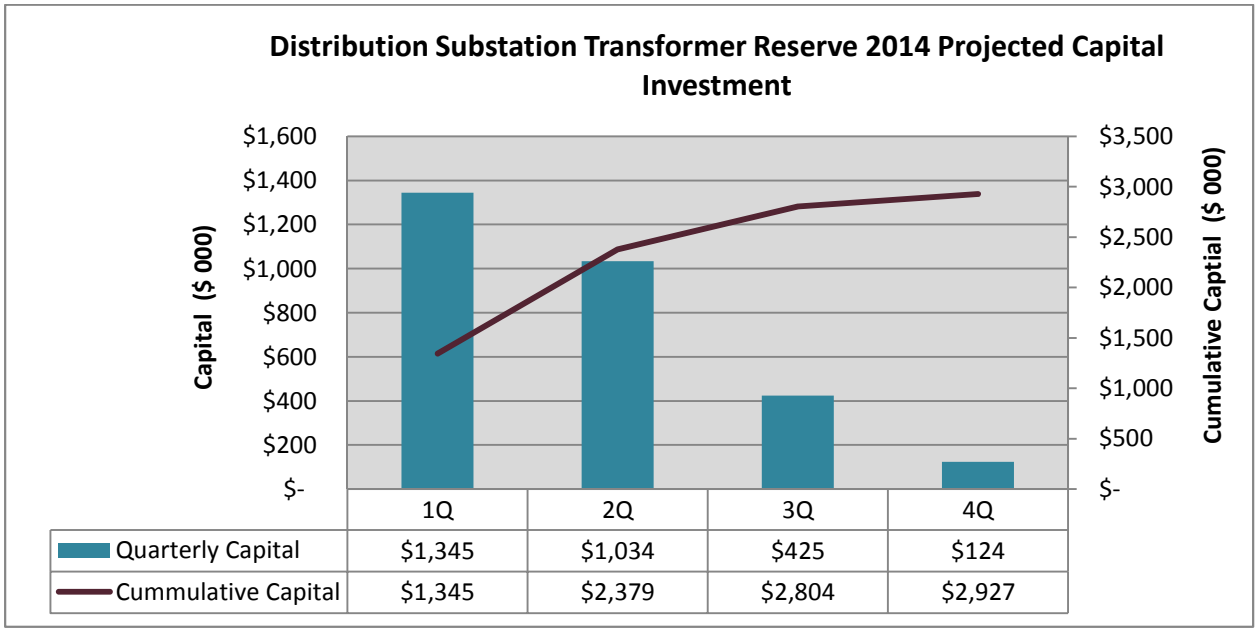
The stations will be generally selected based on the following criteria:

1. Load transfer capability.
2. Number of connected customers.

1.D.2: 2014 Program Capital Investments

Figure 1.D.2 represents the projected 2014 capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $2.9 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

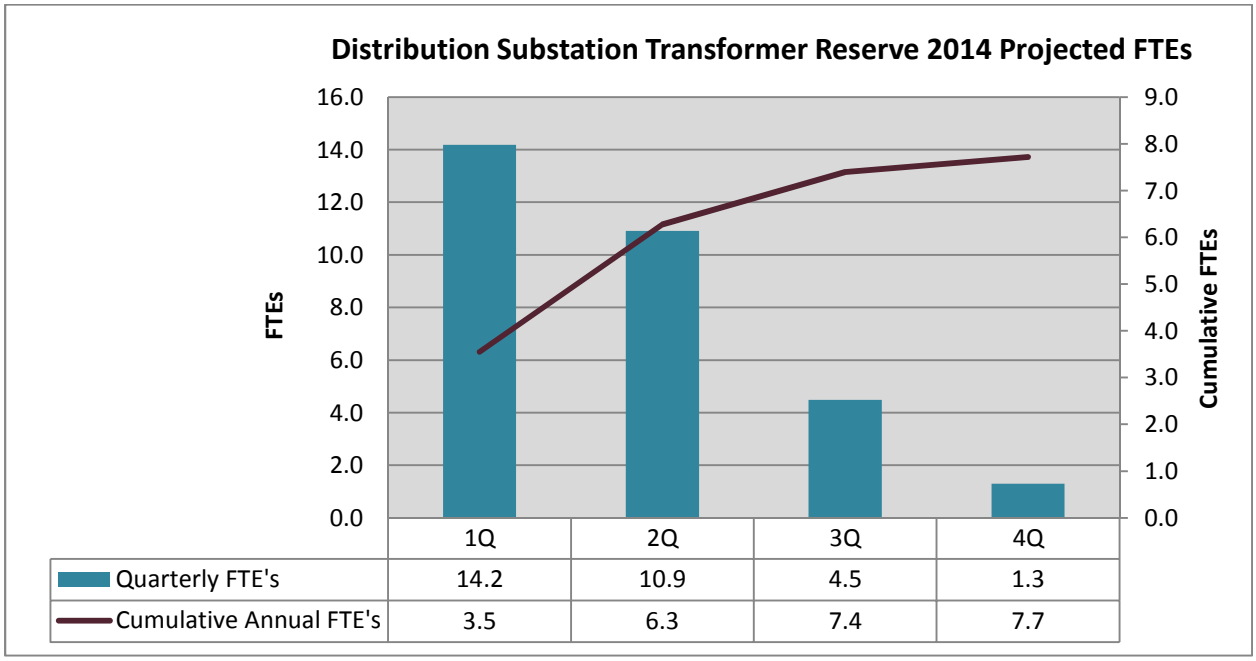
Figure 1.D.2: Distribution Transformer Reserve 2014 Capital Investment



1.D.3: 2014 Program FTEs

Figure 1.D.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.D.3: Distribution Transformer Reserve 2014 FTEs

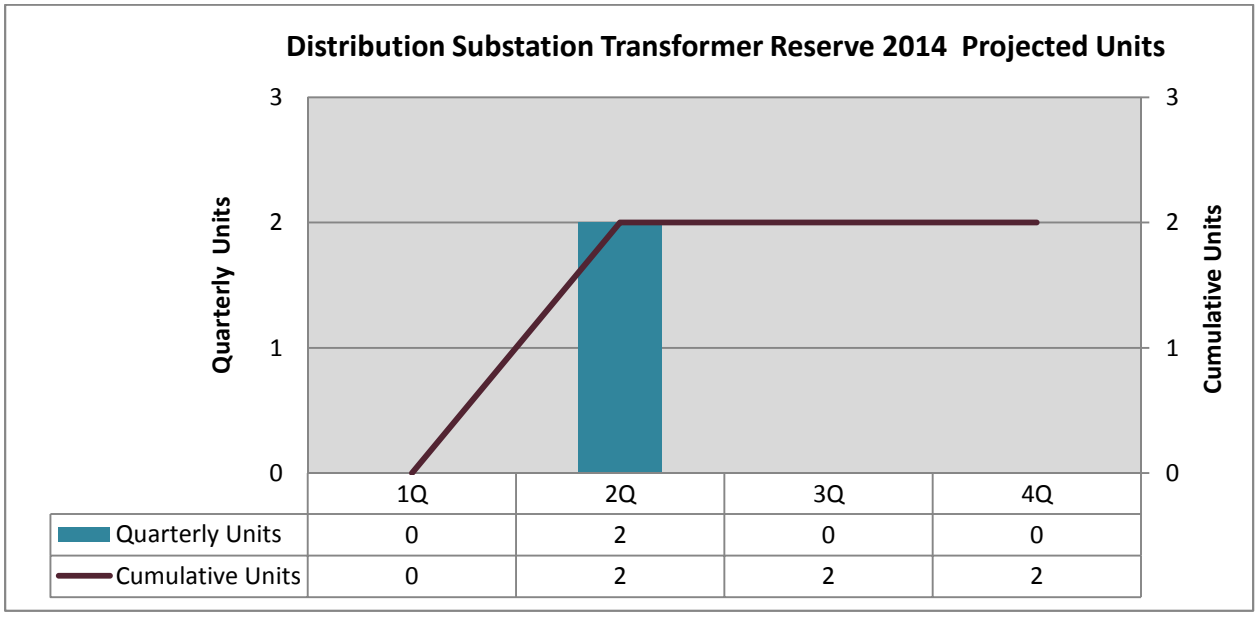


	1Q	2Q	3Q	4Q
Quarterly FTE's	14.2	10.9	4.5	1.3
Cumulative Annual FTE's	3.5	6.3	7.4	7.7

1.D.4: Program Units/Schedule

Figure 1.D.4 shows the projected number of projects to be placed in service in 2014 under this program. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished, as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time.

Figure 1.D.4: Distribution Transformer Reserve 2014 Units



	1Q	2Q	3Q	4Q
Quarterly Units	0	2	0	0
Cumulative Units	0	2	2	2

Section 1.E: Tie Line Capacity – Line 6973

This project is scheduled to start in 2015.

Section 1.F.: Substation Low Side Auto Transfer

1.F.1: 2014 Program Scope

This program will add low side 12kV tie breakers to allow automatic low side transfer in some larger distribution substations with two or more transformers. AIC has over 150 substations 34 or 69kV high side, > 10.0 MVA with more than one transformer. A large percentage of these stations have no automatic transfer to the alternate transformer and/or bus in the event of a transformer protection zone fault. Engineering will commence for this program in 2014.

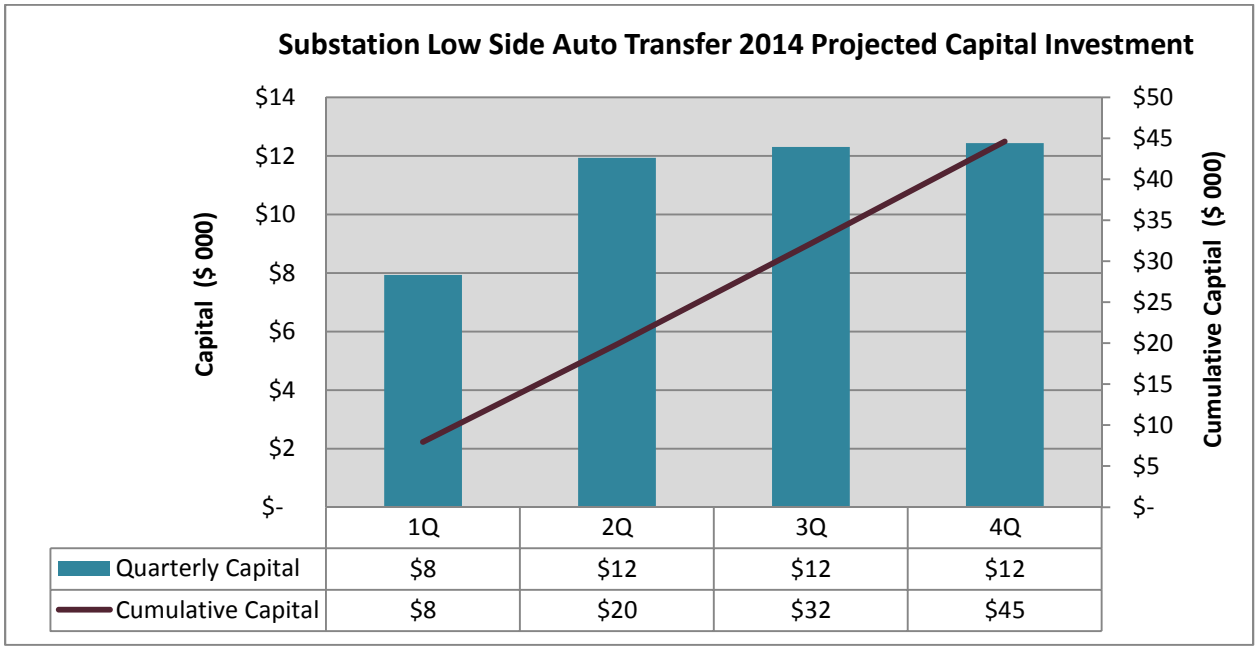
This program will evaluate the most heavily loaded stations by:

1. Customer count.
2. Site feasibility.

1.F.2: 2014 Program Capital Investments

Figure 1.F.2 represents the projected 2014 capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $45,000 in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

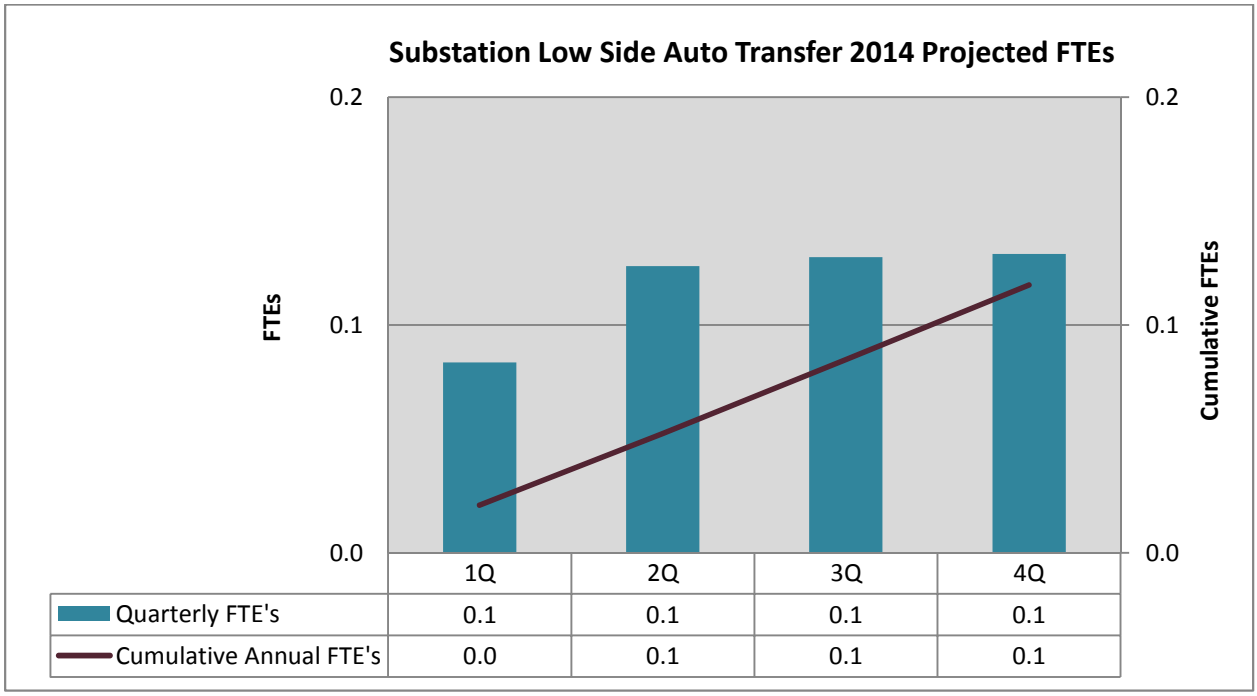
Figure 1.F.2: Substation Low Side Auto Transfer 2014 Capital Investment



1.F.3: 2014 Program FTEs

Figure 1.F.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.F.3: Substation Low Side Auto Transfer 2014 FTEs



1.F.4: Program Units/Schedule

Engineering will occur in 2014 for future projects. There are no units projected to be placed in service in 2014.

Section 1.G: High Voltage Distribution Pole Reinforcement

1.G.1: 2014 Program Scope

The intent of this program is to provide for the replacement of select wood poles with high strength poles, installation of additional high strength poles, or reinforcement of select wood poles on high voltage distribution lines. Hardening these select high voltage distribution lines will limit the likelihood of cascading failures due to extreme transverse loading.

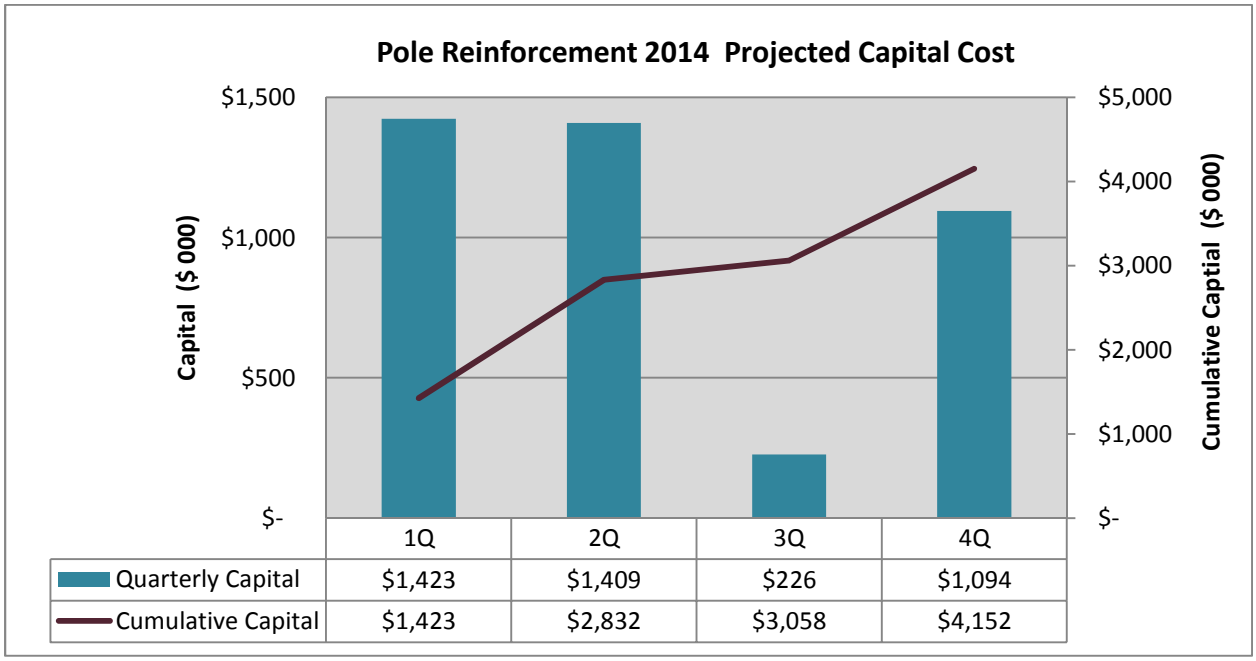
The lines will be generally selected based on:

1. Historical outage information
2. Greatest number of customers
3. Age and ground line condition of the pole
4. Proximity to guyed or protected structures
5. Workload management.

1.G.2: 2014 Program Capital Investments

Figure 1.G.2 represents the projected 2014 capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $4.2 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

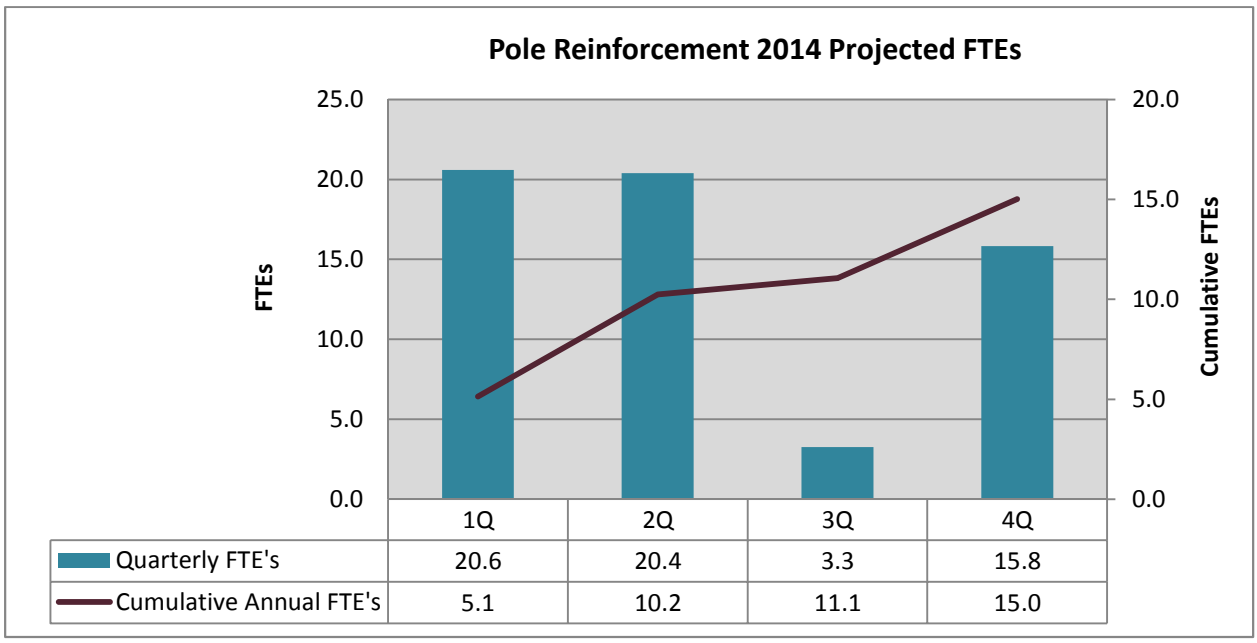
Figure 1.G.2: HV Pole Reinforcement Program 2014 Capital Investment



1.G.3: 2014 Program FTEs

Figure 1.G.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

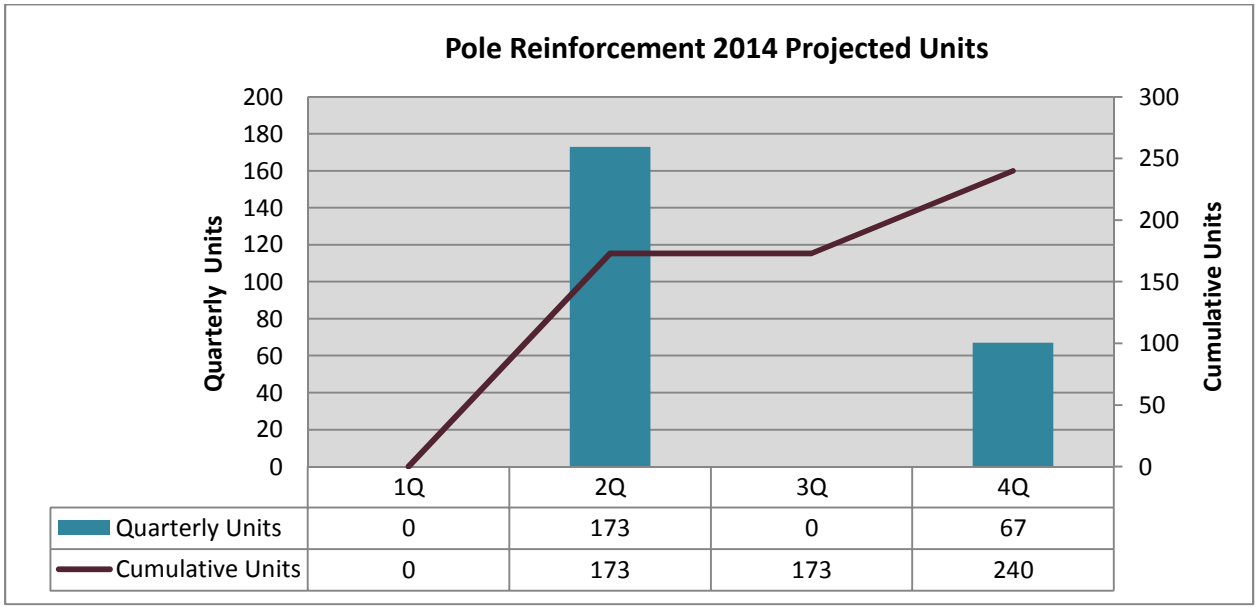
Figure 1.G.3: HV Distribution Pole Reinforcement 2014 FTEs



1.G.4: Program Units/Schedule

Figure 1.G.4 shows the projected number of poles to be replaced, installed or reinforced 2014 under this program. This chart will serve as a tracking mechanism over the course of 2014, and reflects the scope of work planned to be accomplished, as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time.

Figure 1.G.4: HV Pole Reinforcement Program 2014 Units



Section 1.H: Replace High Voltage Distribution Breakers

1.H.1: 2014 Program Scope

This program provides for the replacement of aging 34kV or 69kV breakers. AIC has over one thousand 34kV and 69kV breakers, and over 400 are greater than 40 years old. Many of them have problematic mechanisms that are beyond a reasonable maintenance strategy.

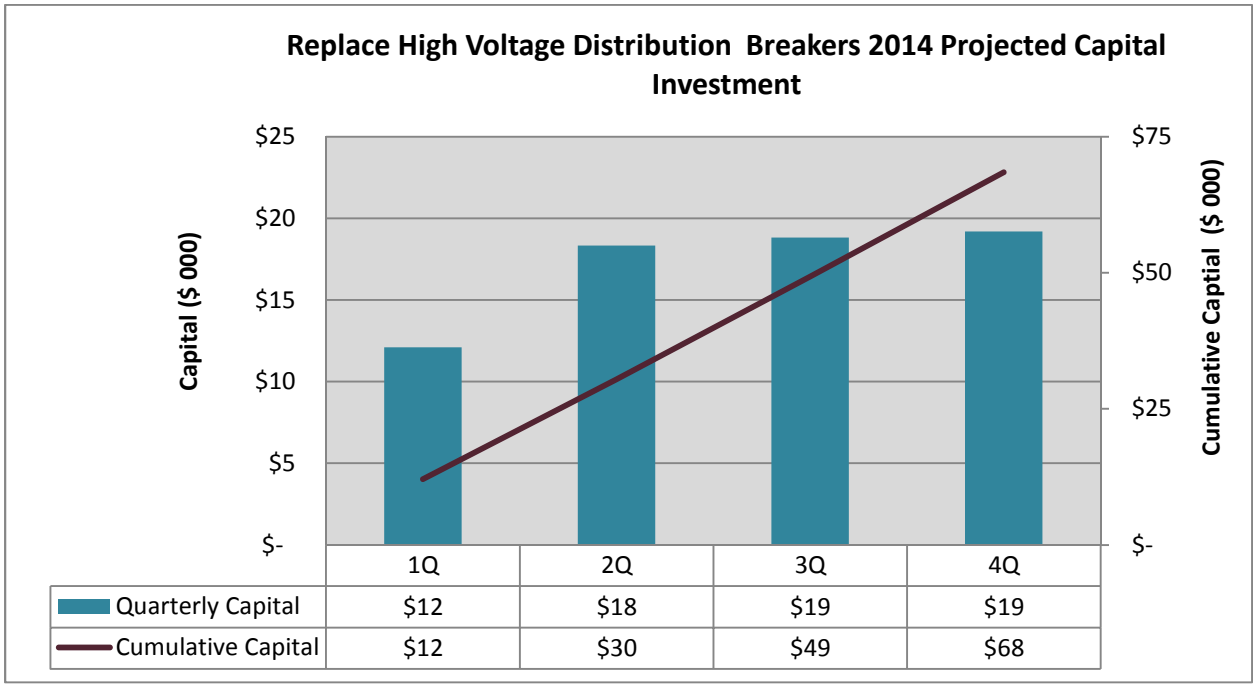
The breakers will be generally selected on the basis of:

1. Customer counts.
2. Maintenance history.
3. Criticality of load.
4. Workload management

1.H.2: 2014 Program Capital Investments

Figure 1.H.2 represents the projected capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $68,000 in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

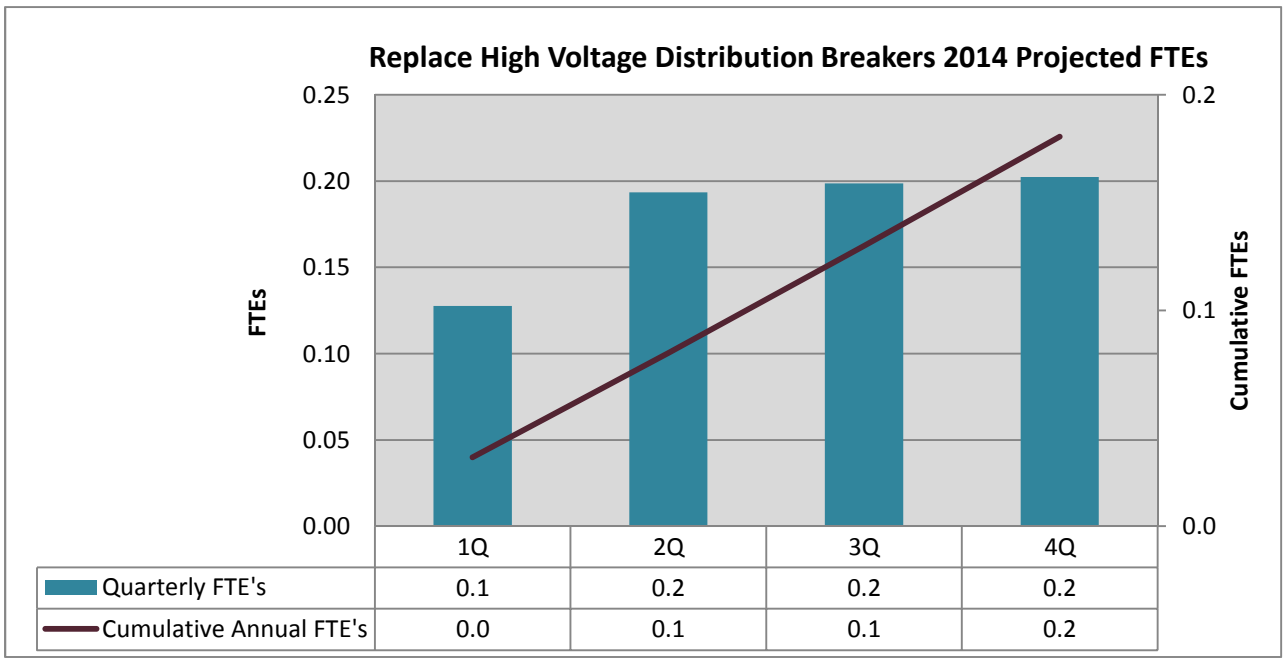
Figure 1.H.2: Replace HV Distribution Breakers Program 2014 Capital Investment



1.H.3: 2014 Program FTEs

Figure 1.H.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.H.3: Replace HV Distribution Breakers Program 2014 FTEs



1.H.4: Program Units/Schedule

The investments under this program in 2014 are for engineering only. No units will be installed.

Section 1.I: Spacer Cable Program

1.I.1: 2014 Program Scope

This program is designed to improve the performance of spacer cable systems and the reliability of the circuits involved. In cases where the insulation has severely deteriorated, this involves replacement of the existing spacer cable. Depending upon the specific application, a new spacer cable system may be installed or new open wire conductors may be utilized.

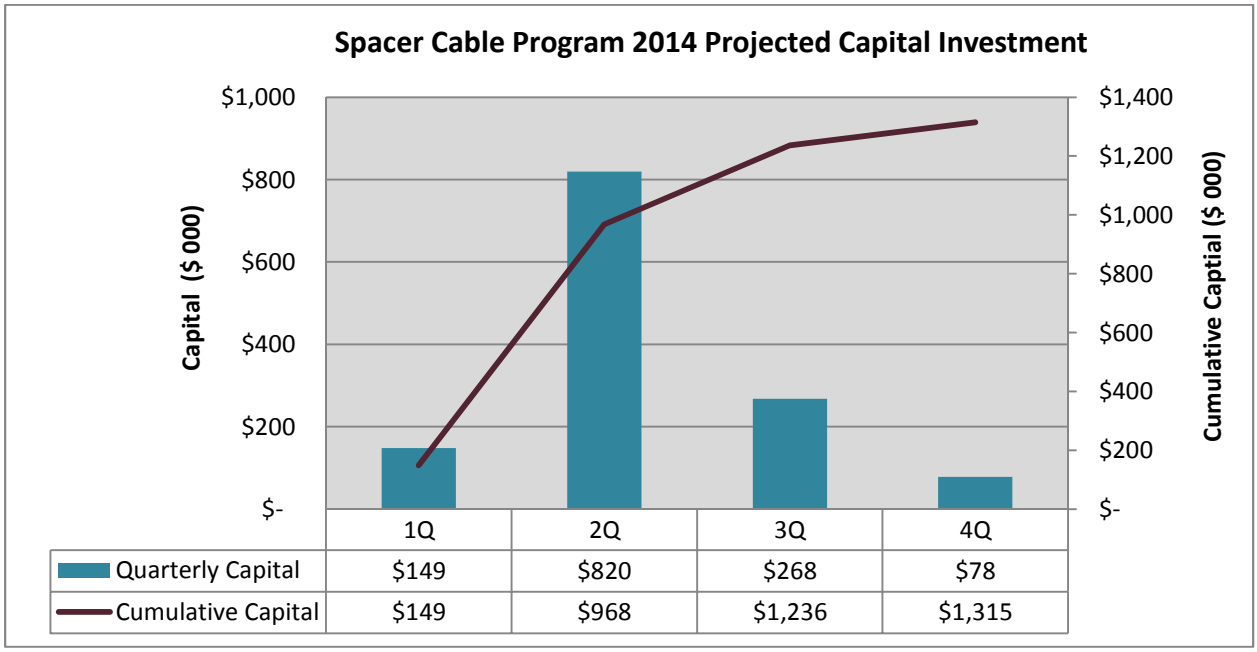
The spacer cable projects for 2014 were generally selected on the basis of:

1. Inspection results
2. Greatest number of customers
3. Engineering availability
4. Workload management

1.I.2: 2014 Program Capital Investments

Figure 1.I.2 represents the projected 2014 capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $1.3 million in capital investment, plus associated expenses. Estimates of cost, units of work and schedules for that work may evolve over time.

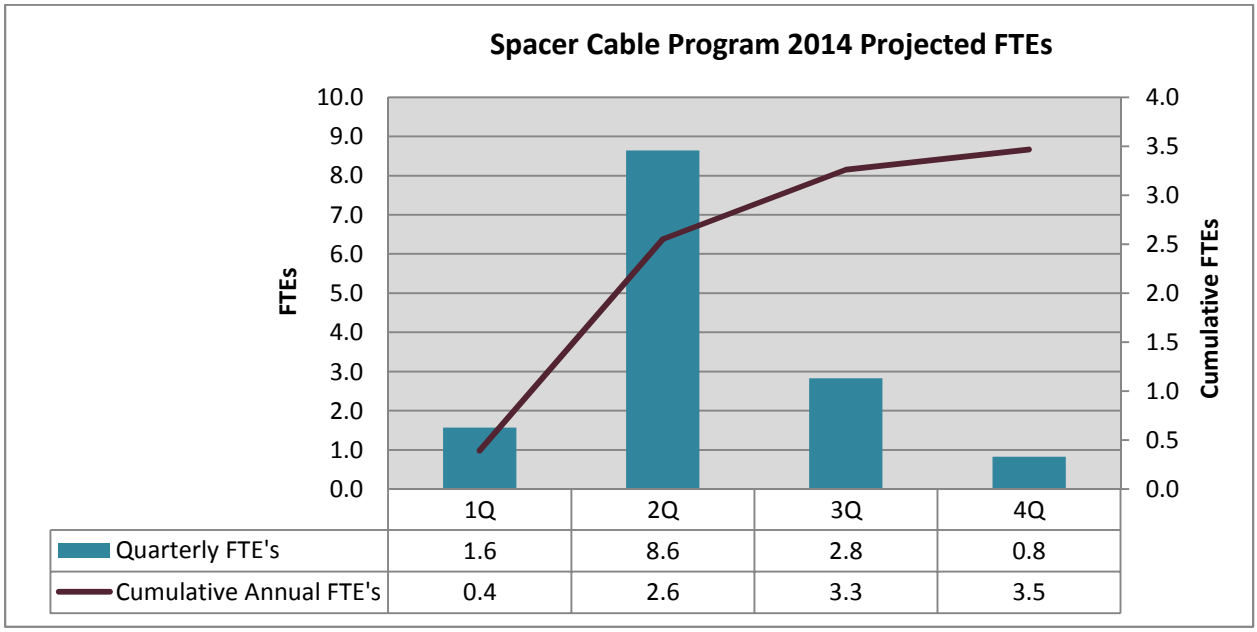
Figure 1.I.2: Spacer Cable Program 2014 Capital Investments



1.I.3: 2014 Program FTEs

Figure 1.I.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.I.3: Spacer Cable Program 2014 FTEs

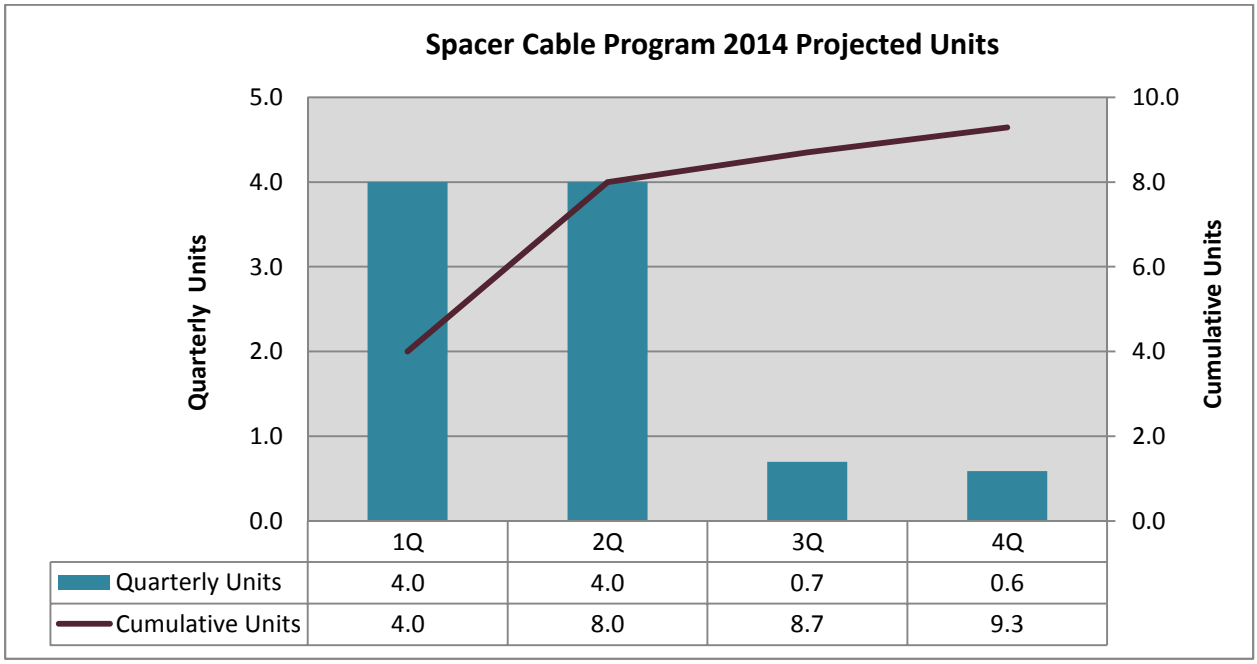


	1Q	2Q	3Q	4Q
Quarterly FTE's	1.6	8.6	2.8	0.8
Cumulative Annual FTE's	0.4	2.6	3.3	3.5

1.I.4: Program Units/Schedule

Figure 1.I.4 represents the projected units to be completed for this program in 2014. Engineering for 2014 projects will commence in 2014. The units for the Spacer Cable Program are miles.

Figure 1.I.4: Spacer Cable Program 2014 Units



Section 1.J: Rebuild Primary Distribution Lines

1.J.1: 2014 Program Scope

This program is designed to rebuild select distribution circuits. These projects could include reconductoring, replacing poles, or total rebuilds.

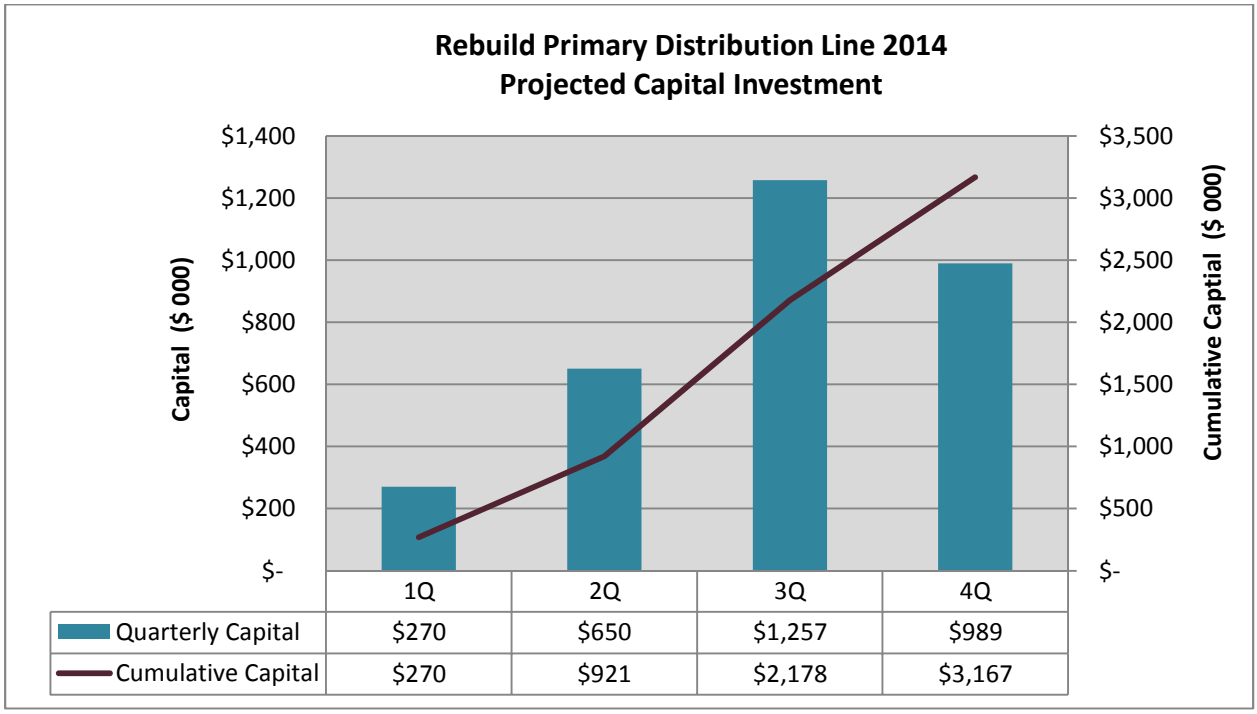
These projects were generally selected on the basis of:

1. Line Condition
2. Greatest number of customers
3. Outage history
4. Workload management
5. System improvement possibilities

1.J.2: 2014 Program Capital Investments

Figure 1.J.2 represents the projected capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $3.2 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

Figure 1.J.2: Rebuild Primary Distribution Lines 2014 Capital Investments

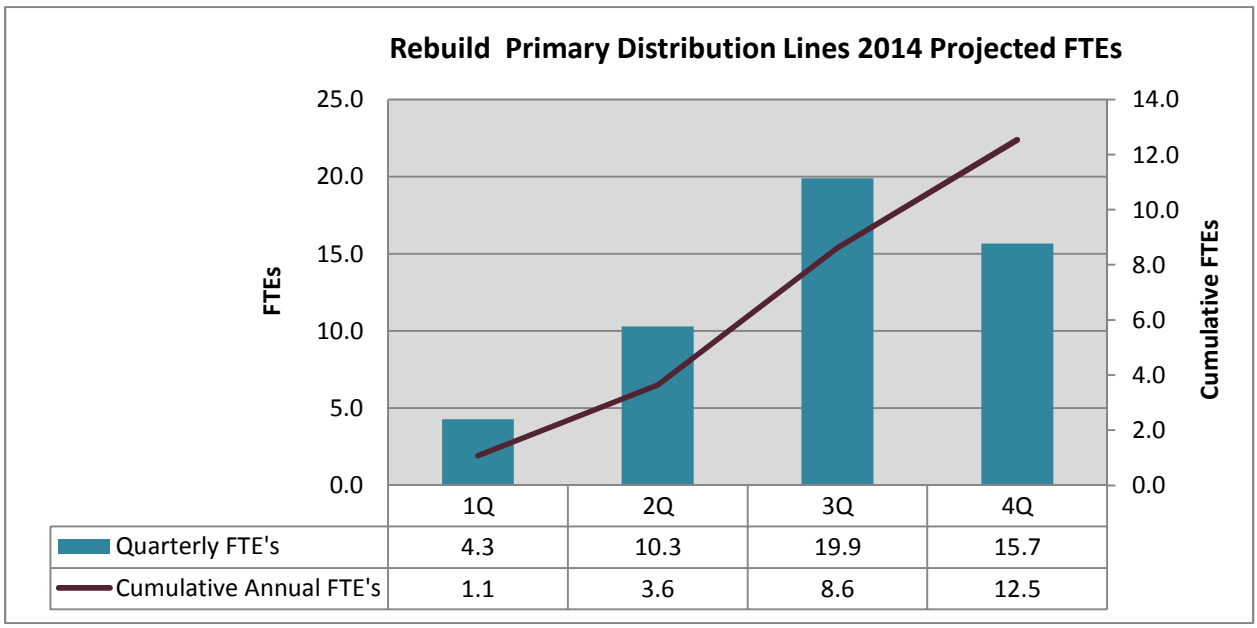


	1Q	2Q	3Q	4Q
Quarterly Capital	$270	$650	$1,257	$989
Cumulative Capital	$270	$921	$2,178	$3,167

1.J.3: 2014 Program FTEs

Figure 1.J.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.J.3: Rebuild Primary Distribution Lines 2014 FTEs

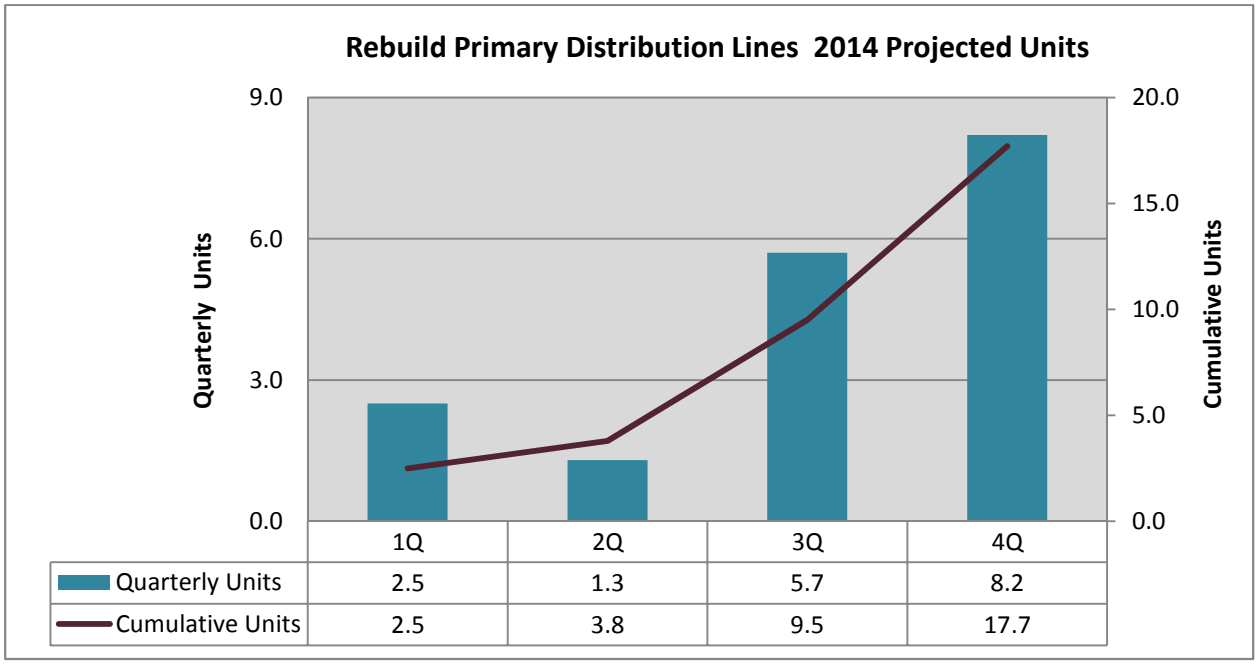


	1Q	2Q	3Q	4Q
Quarterly FTE's	4.3	10.3	19.9	15.7
Cumulative Annual FTE's	1.1	3.6	8.6	12.5

1.J.4: Program Schedule/Units

Figure 1.J.4 shows the number of units to be completed in 2014 under this program. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown below are miles.

Figure 1.J.4: Rebuild Primary Distribution Lines Units



	1Q	2Q	3Q	4Q
Quarterly Units	2.5	1.3	5.7	8.2
Cumulative Units	2.5	3.8	9.5	17.7

Section 1.K: Primary Distribution Lines Capacity Additions

1.K.1: 2014 Program Scope

This program is designed to upgrade or modify existing distribution circuits to provide additional capacity. The additional capacity may be required due to such items as existing or anticipated load, load transfer capability, or voltage conversions.

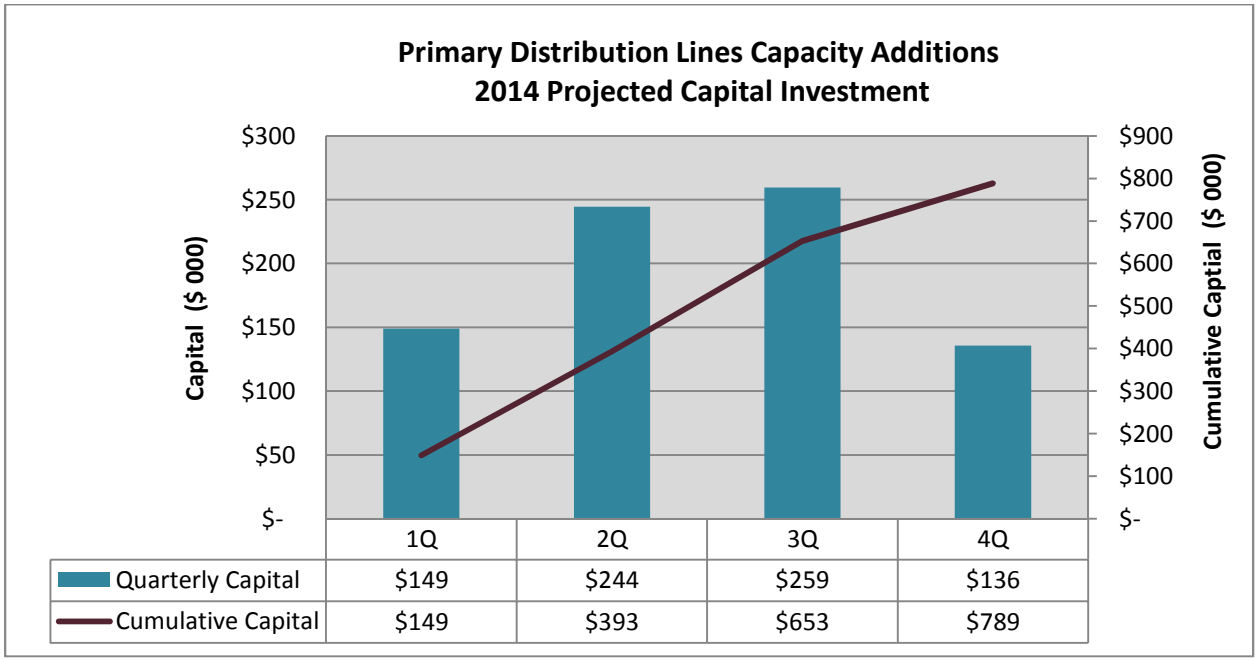
These projects were generally selected on the basis of:

1. Thermal load considerations
2. Load transfer capabilities
3. Projected load growth
4. Reliability history
5. Workload management

1.K.2: 2014 Program Capital Investments

Figure 1.K.2 represents the projected 2014 capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $789,000 in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

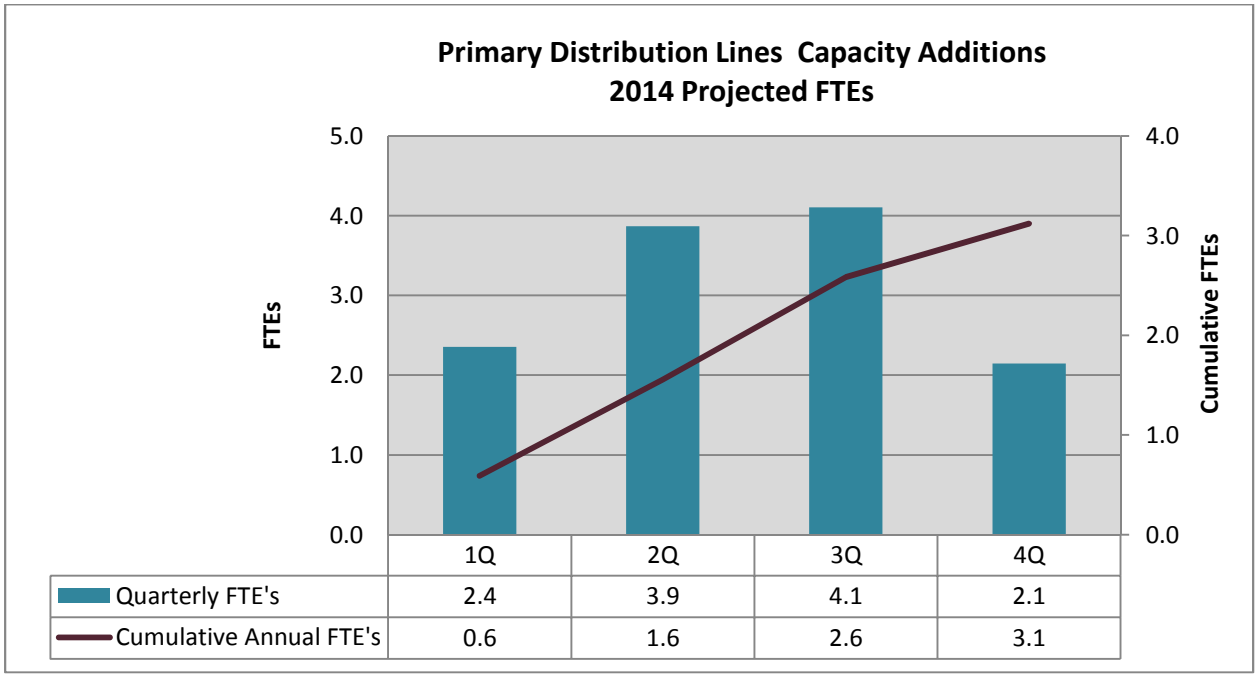
Figure 1.K.2: Primary Distribution Line Capacity Additions 2014 Capital Investments



1.K.3: 2014 Program FTEs

Figure 1.K.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.K.3: Primary Distribution Lines Capacity Additions 2014 FTEs

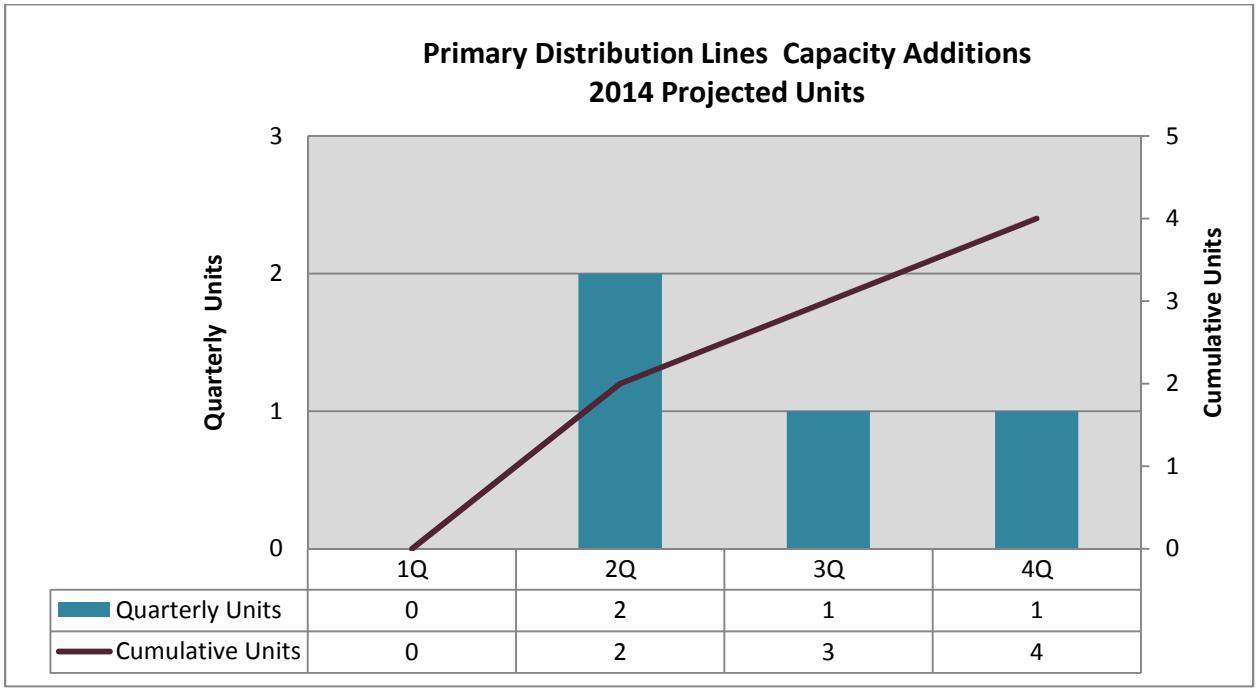


	1Q	2Q	3Q	4Q
Quarterly FTE's	2.4	3.9	4.1	2.1
Cumulative Annual FTE's	0.6	1.6	2.6	3.1

1.K.4: Program Schedule/Units

Figure 1.K.4 shows the number of distribution line capacity additions to be completed in 2014 under this program. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown below are projects.

Figure 1.K.4: Primary Distribution Lines Capacity Additions 2014 Units



	1Q	2Q	3Q	4Q
Quarterly Units	0	2	1	1
Cumulative Units	0	2	3	4

Section 1.L: Bulk Transformer Outage Mitigation

1.L.1: 2014 Program Scope

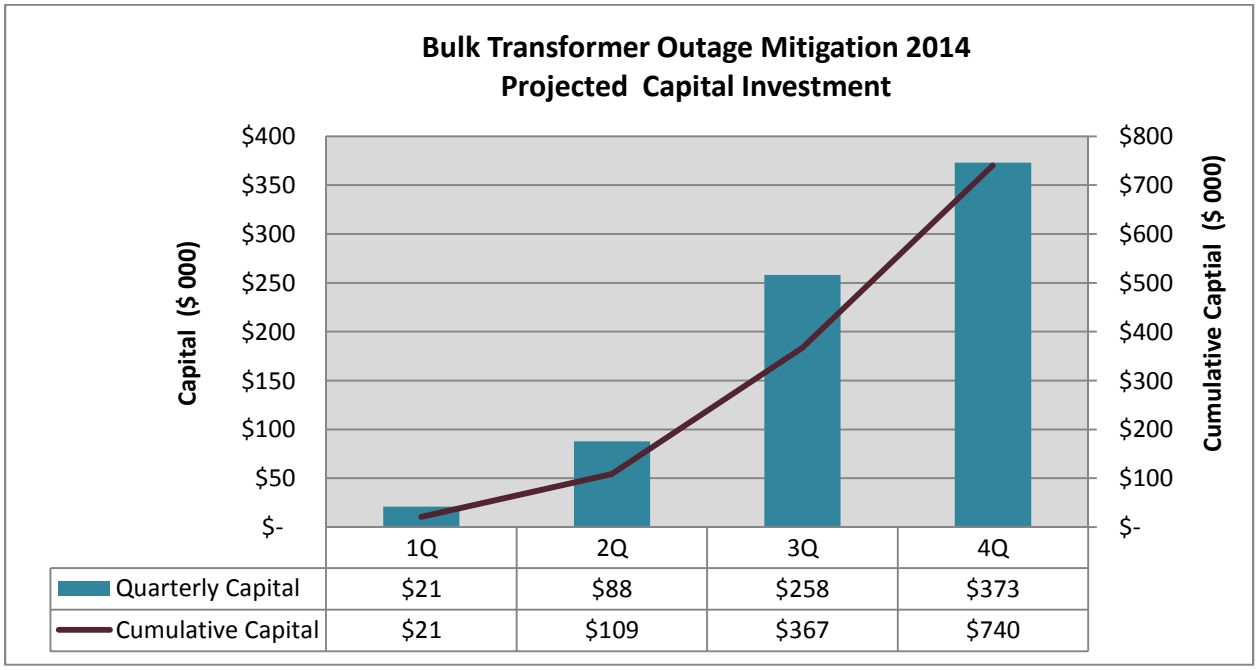
This program is to provide system reinforcements by installing a second bulk supply transformer, building a new bulk supply substation, or reconductoring high voltage distribution lines to provide the system redundancy required to facilitate system maintenance and avoid load curtailments during a bulk substation transformer outage.

Evaluation of potential projects includes the analyses of the robustness of the system during off peak season when a planned outage of a bulk supply transformer might occur for maintenance purposes. The criteria specifies that for the planned outage of a bulk supply transformer and the loss of a single high voltage distribution line, transmission line or generating unit while supplying 65% of projected peak system load, the system shall operate with all equipment at or below emergency thermal limits and within voltage limits.

1.L.2: 2014 Program Capital Investments

Figure 1.L.2 represents the projected 2014 capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $740,000 in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

Figure 1.L.2: Bulk Transformer Outage Mitigation 2014 Capital Investments

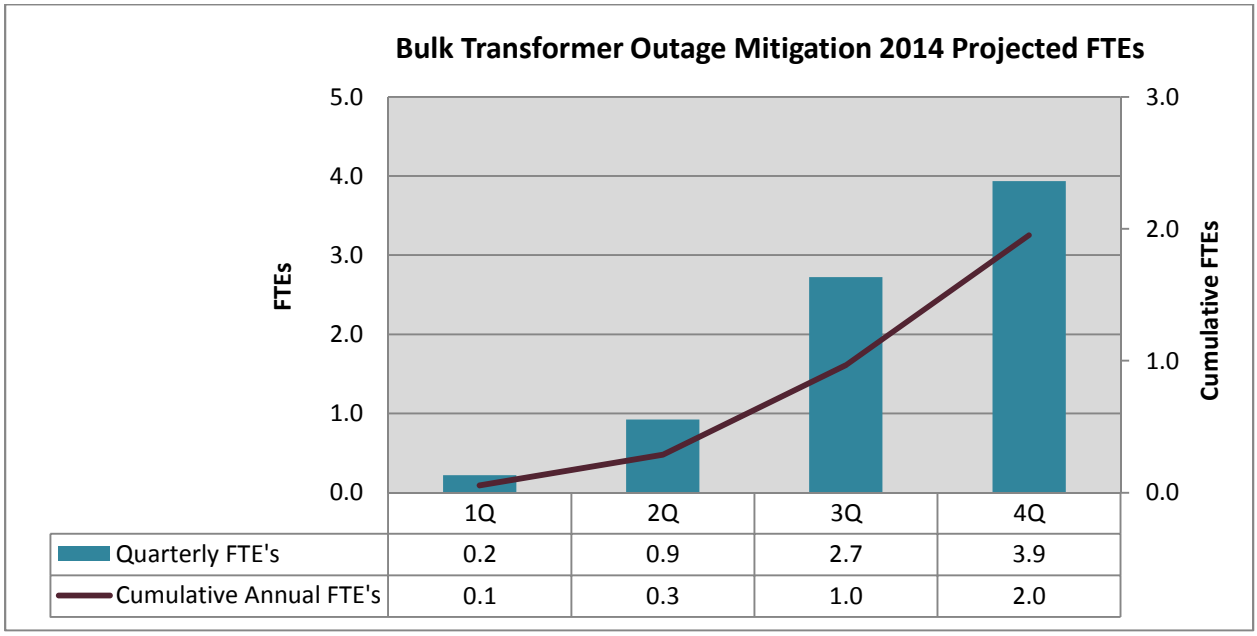


	1Q	2Q	3Q	4Q
Quarterly Capital	$21	$88	$258	$373
Cumulative Capital	$21	$109	$367	$740

1.L.3: 2014 Program FTEs

Figure 1.L.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.L.3: Bulk Transformer Outage Mitigation 2014 FTEs

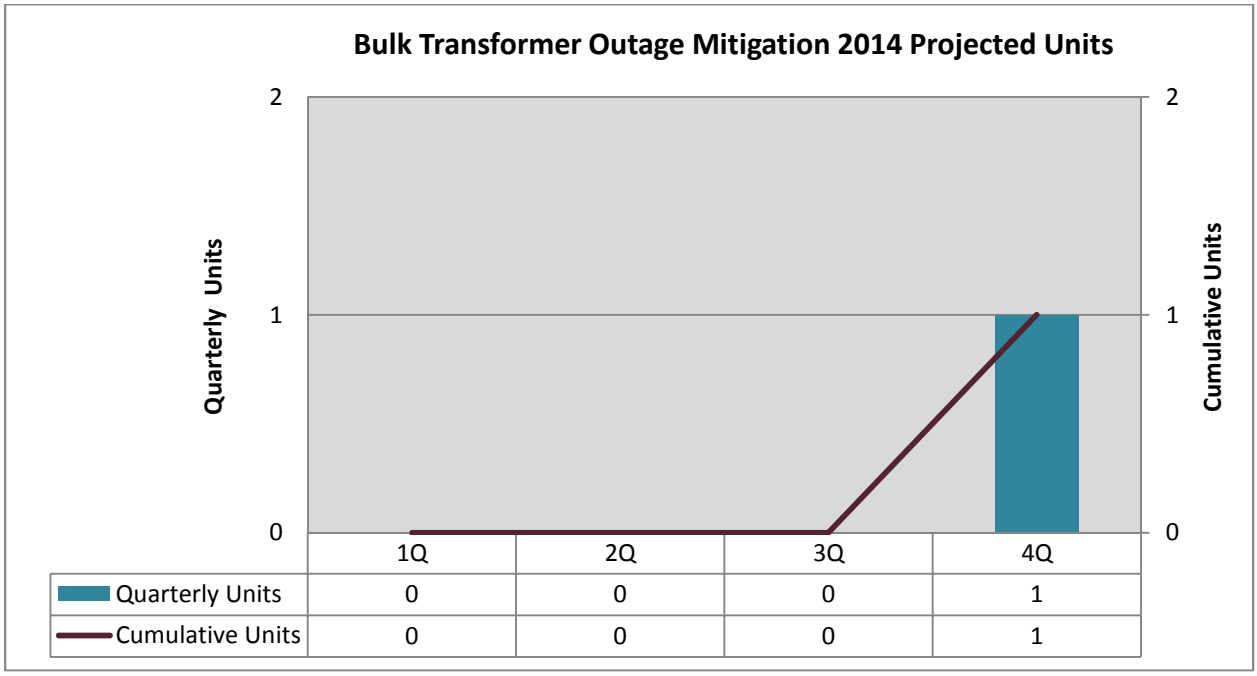


	1Q	2Q	3Q	4Q
Quarterly FTE's	0.2	0.9	2.7	3.9
Cumulative Annual FTE's	0.1	0.3	1.0	2.0

1.L.4: Program Schedule/Units

Figure 1.L.4 shows the number of units to be completed in 2014 under this program. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown below are projects.

Figure 1.K.4: Bulk Transformer Outage Mitigation 2014 Units



Section 1.M: Rebuild High Voltage Distribution Lines

1.M.1: 2014 Program Scope

This program is designed to rebuild existing high voltage distribution circuits that are in poor condition, require additional capacity, require additional lighting protection, or need additional system ties.

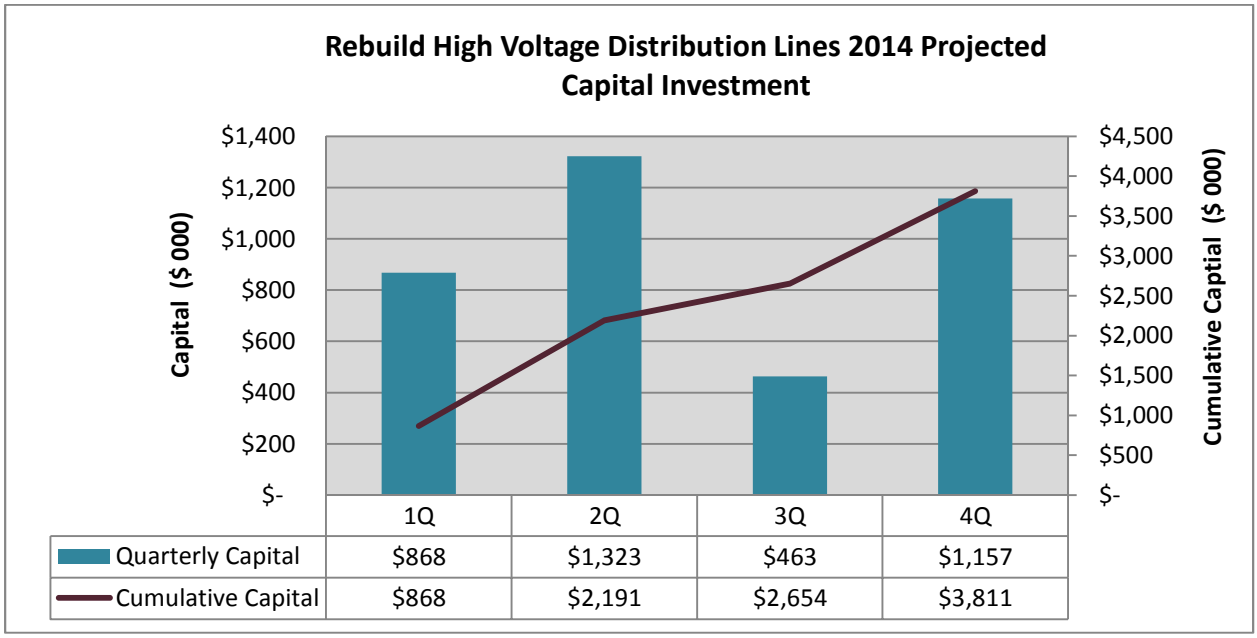
These projects were generally selected on the basis of:

1. Greatest number of customers
2. Outage history
3. Condition of the facilities
4. System operating parameters
5. Workload management

1.M.2: 2014 Program Capital Investments

Figure 1.M.2 represents the projected 2014 capital expenditures this program in 2014. AIC estimates the 2014 program cost to be approximately $3.8 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work, may evolve over time.

Figure 1.M.2: Rebuild High Voltage Distribution Lines 2014 Capital Investments

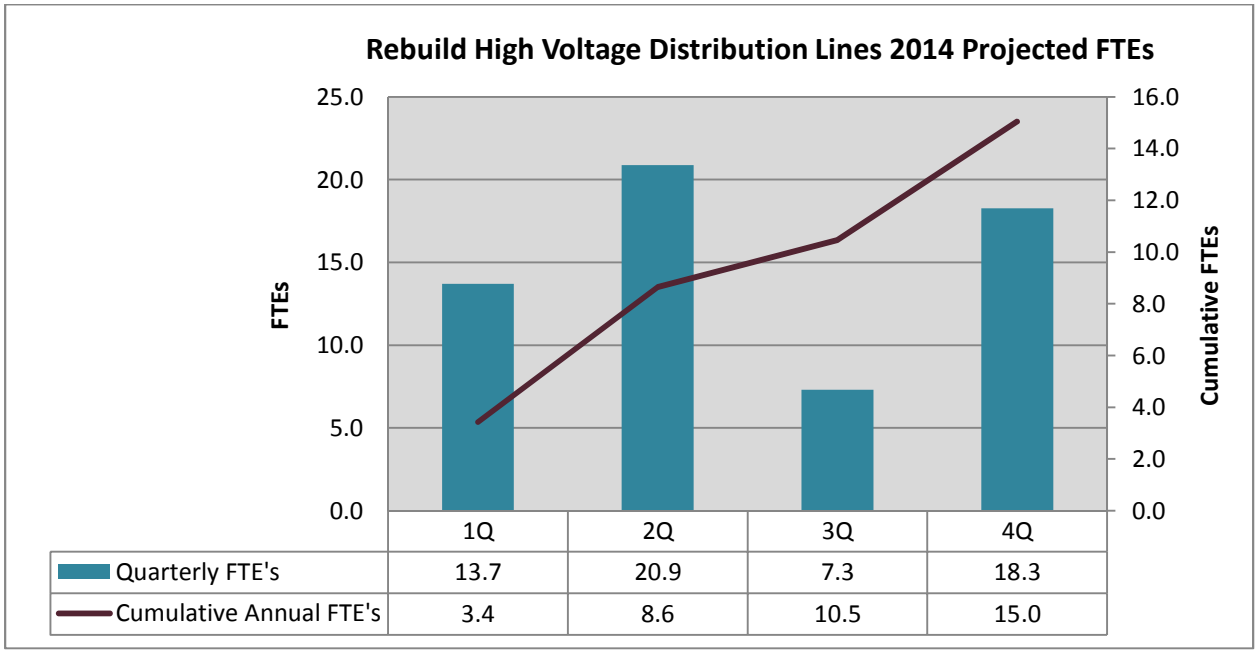


	1Q	2Q	3Q	4Q
Quarterly Capital	$868	$1,323	$463	$1,157
Cumulative Capital	$868	$2,191	$2,654	$3,811

1.M.3: 2014 Program FTEs

Figure 1.M.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.M.3: Rebuild High Voltage Distribution Lines 2014 FTEs

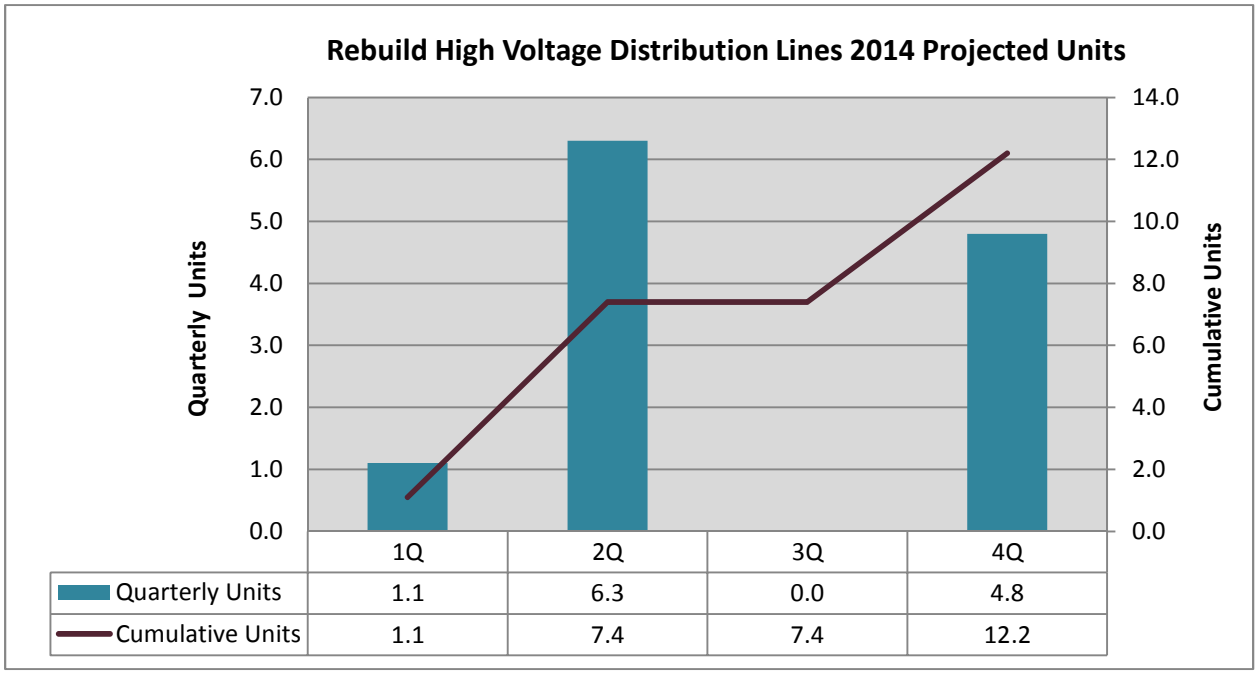


	1Q	2Q	3Q	4Q
Quarterly FTE's	13.7	20.9	7.3	18.3
Cumulative Annual FTE's	3.4	8.6	10.5	15.0

1.M.4: Program Schedule/Units

Figure 1.M.4 shows the units to be completed under this program in 2014. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown below are miles.

Figure 1.M.4: Rebuild High Voltage Distribution Lines 2014 Units



	1Q	2Q	3Q	4Q
Quarterly Units	1.1	6.3	0.0	4.8
Cumulative Units	1.1	7.4	7.4	12.2

Section 1.N: Expand Bulk Supply Substations

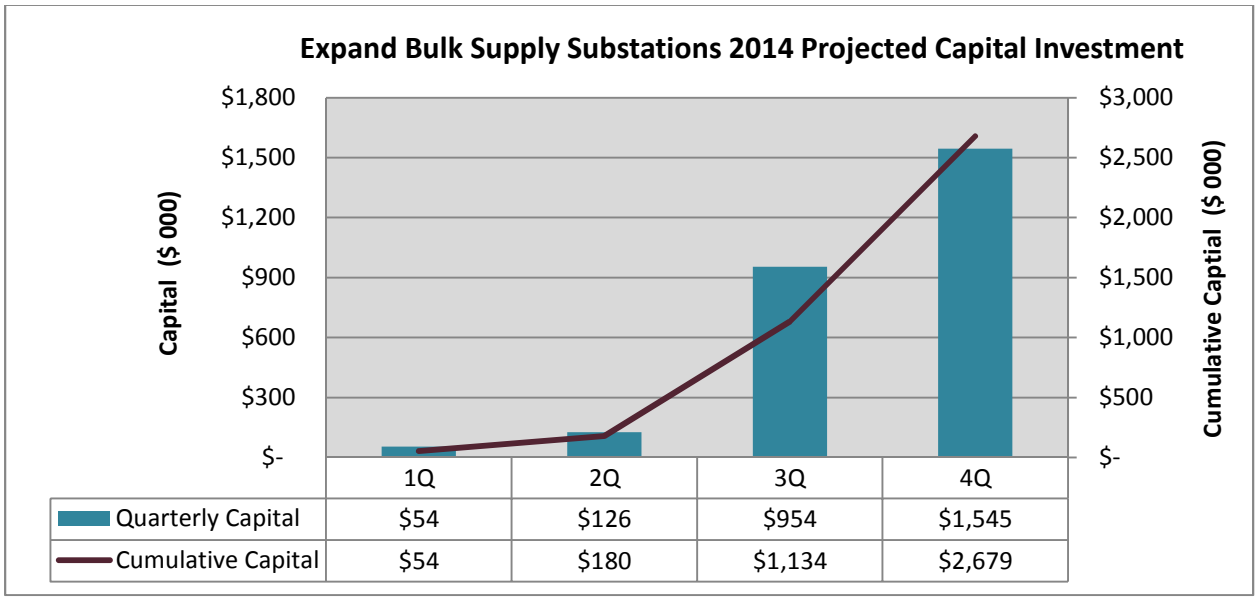
1.N.1: 2014 Program Scope

This program will construct new bulk supply substations (e.g., 161/69 kV, 138/69 kV, and 138/34.5 kV), or install new bulk supply transformers at existing substation locations, and implement associated line and equipment reinforcements.

1.N.2: 2014 Program Capital Investments

Figure 1.N.2 represents the projected 2014 capital expenditures for this program in 2014. AIC estimates the 2014 program cost to be approximately $2.7 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work, may evolve over time.

Figure 1.N.2: Expand Bulk Supply Substations 2014 Capital Investments

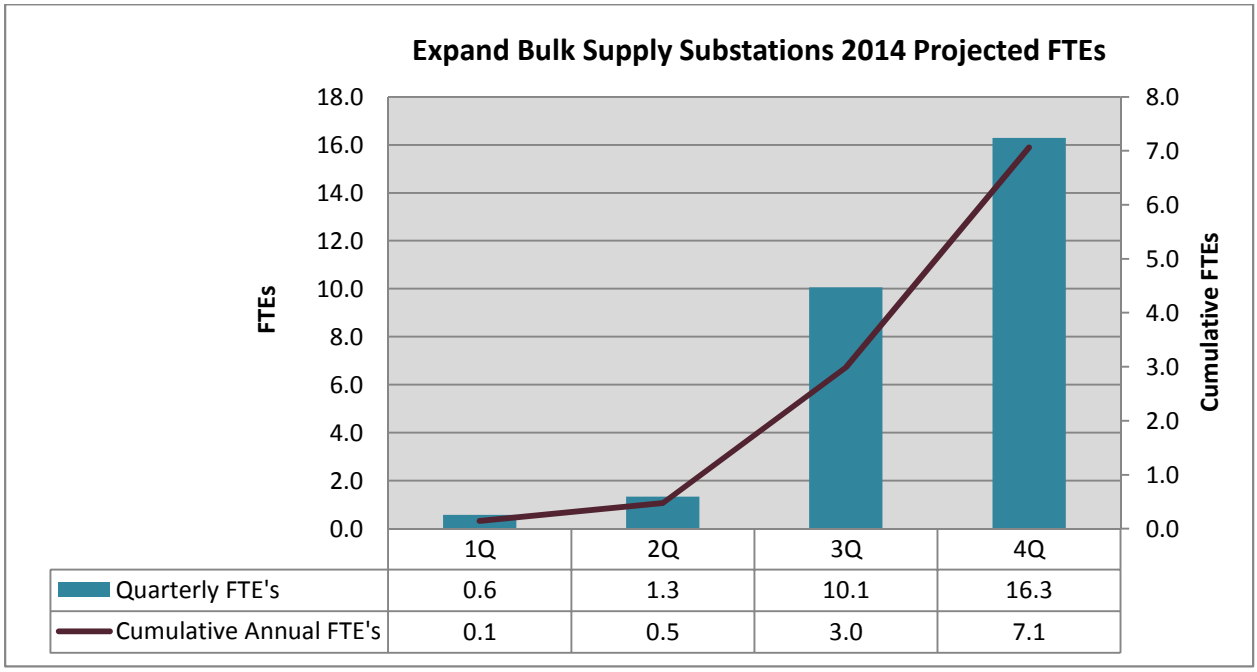


	1Q	2Q	3Q	4Q
Quarterly Capital	$54	$126	$954	$1,545
Cumulative Capital	$54	$180	$1,134	$2,679

1.N.3: 2014 Program FTEs

Figure 1.N.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.N.3: Expand Bulk Supply Substations 2014 FTEs



	1Q	2Q	3Q	4Q
Quarterly FTE's	0.6	1.3	10.1	16.3
Cumulative Annual FTE's	0.1	0.5	3.0	7.1

1.N.4: Program Schedule/Units

Engineering and construction will commence for this project in 2014.

Section 1.O: Underground Primary Distribution Cable

1.O.1: 2014 Program Scope

This program will replace or inject underground cable in 2014 that has been identified through historical outage information and engineering analysis. These cables may be either individual or multiple cable sections within an underground system.

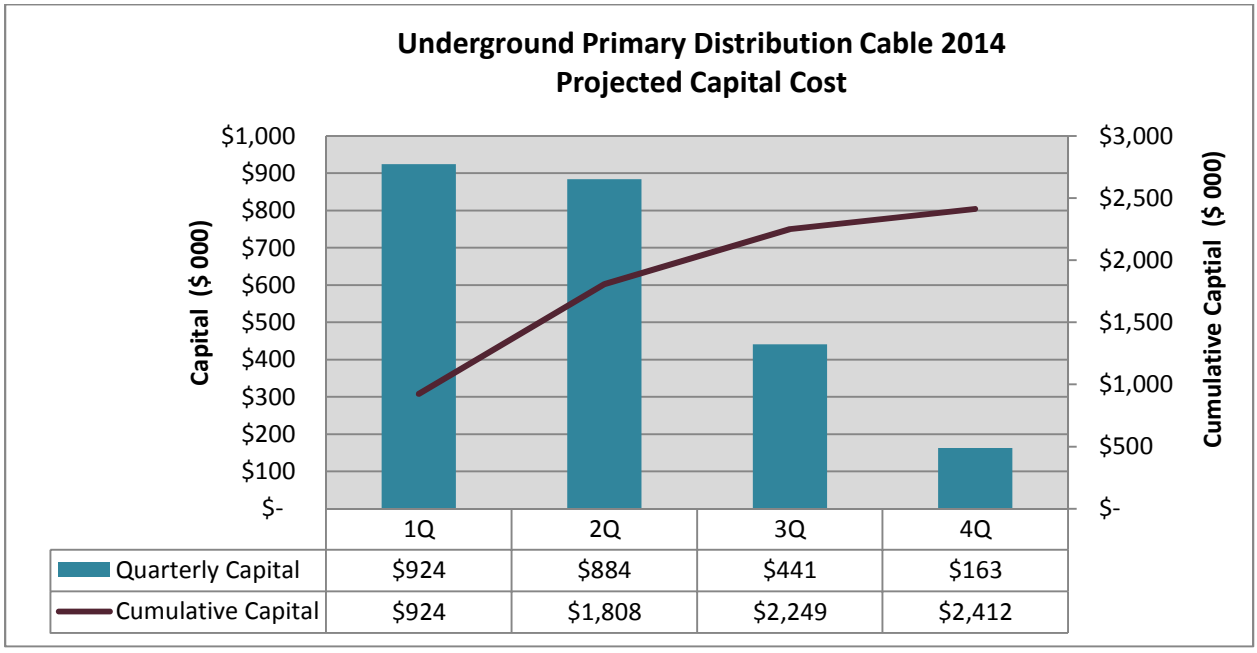
These projects were generally selected on the basis of:

1. Historical outage information
2. Age of the cable
3. Engineering analysis
4. Greatest number of customers
5. Workload management

1.O.2: 2014 Program Capital Investments

Figure 1.O.2 represents the projected 2014 capital expenditures for this program in 2014. AIC estimates the 2014 program cost to be approximately $2.4 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

Figure 1.O.2: Underground Primary Distribution Cable 2014 Capital Investments

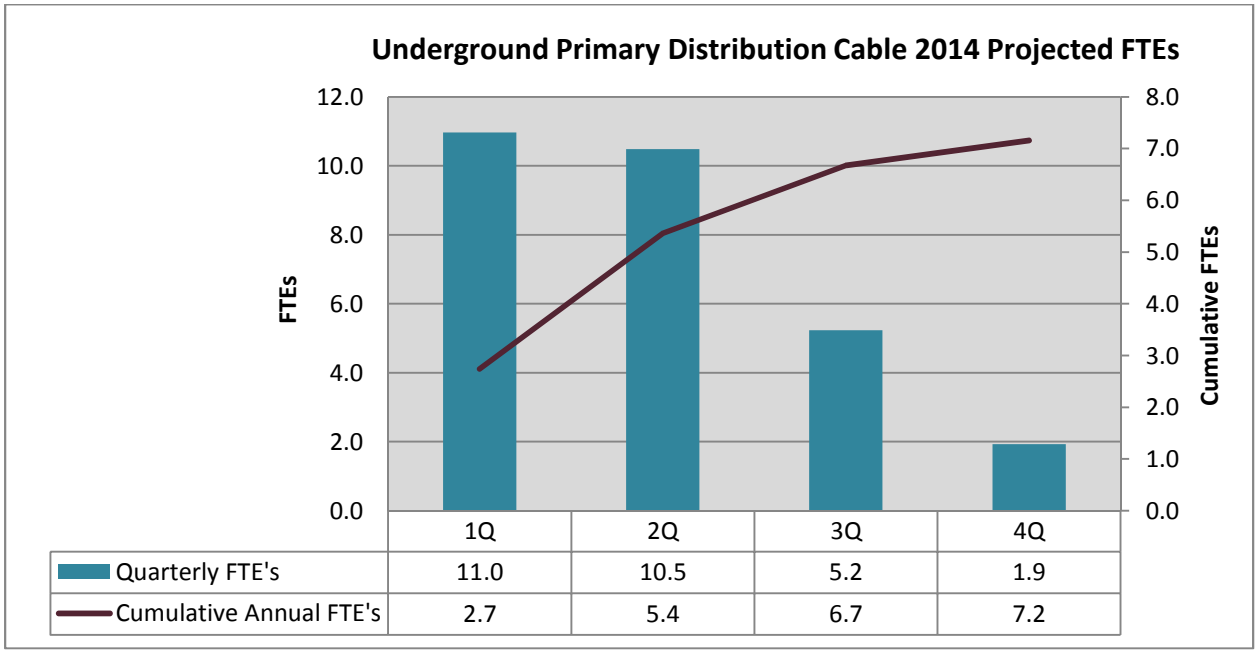


	1Q	2Q	3Q	4Q
Quarterly Capital	$924	$884	$441	$163
Cumulative Capital	$924	$1,808	$2,249	$2,412

1.O.3: 2014 Program FTEs

Figure I.O.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

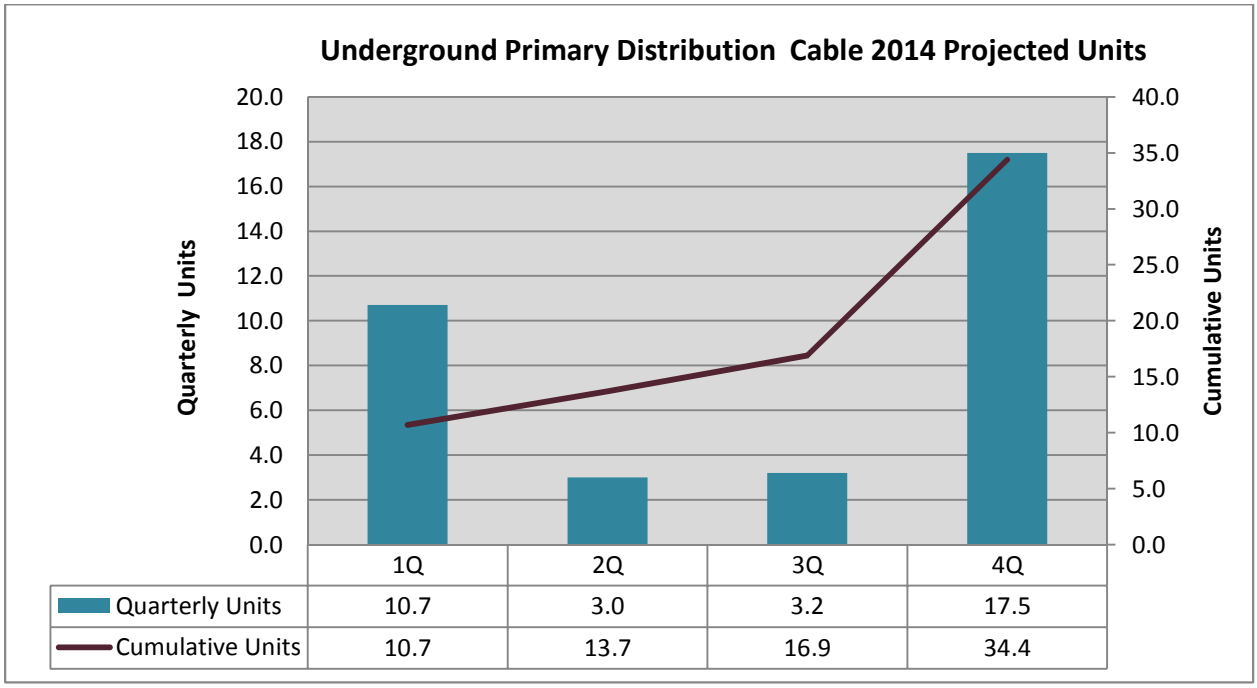
Figure 1.O.3: Underground Primary Distribution Cable 2014 FTEs



1.O.4: Program Units

Figure 1.O.4 shows the units to be replaced in 2014 under this program. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown are miles.

Figure 1.O.4: Underground Primary Distribution Cable Units



	1Q	2Q	3Q	4Q
Quarterly Units	10.7	3.0	3.2	17.5
Cumulative Units	10.7	13.7	16.9	34.4

Section 1.P: System Tie Primary Distribution

1.P.1: 2014 Program Scope

This program plans to build or reconductor primary distribution circuits to tie primary distribution circuits together for better operating efficiency and reliability. This could include making distribution ties between adjacent substations, tying legacy company circuits together that are in closer proximity, or tying to other utility sources such as Co-Ops and municipalities.

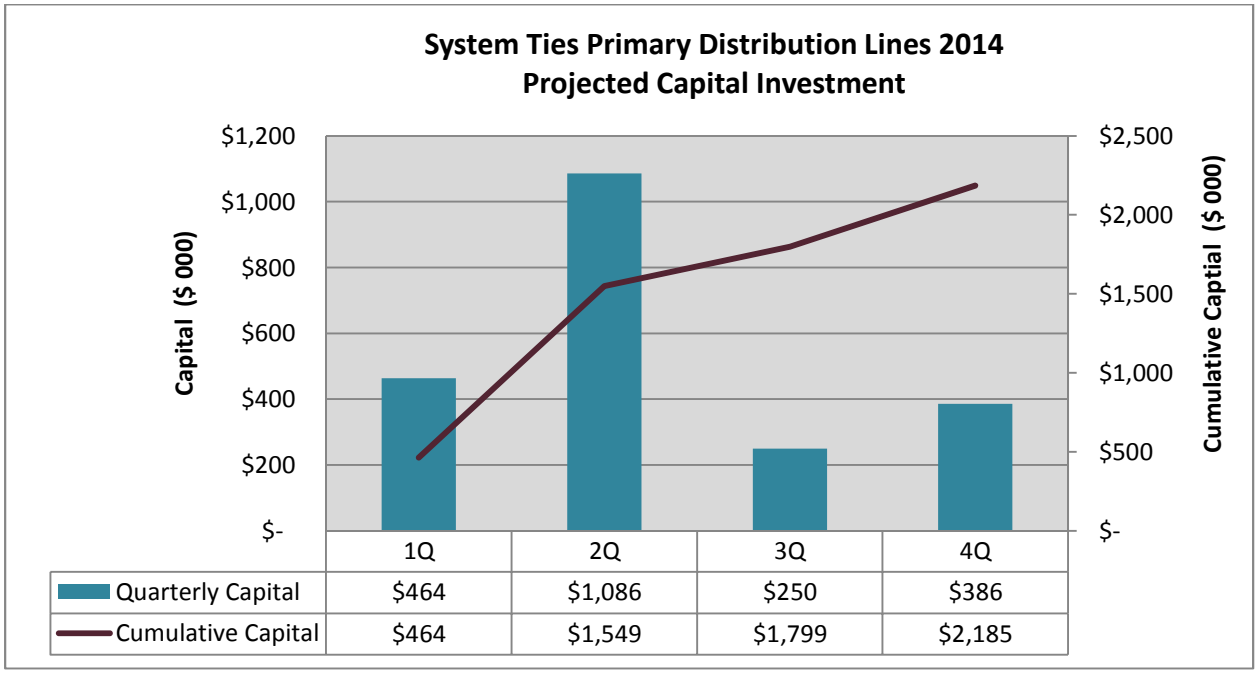
System tie projects were generally selected based on:

1. System benefit
2. Greatest number of customers.
3. Outage history
4. Workload management

1.P.2: 2014 Program Capital Investments

Figure 1.P.2 represents the projected 2014 capital expenditures for this program in 2014. AIC estimates the 2014 program cost to be approximately $2.2 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

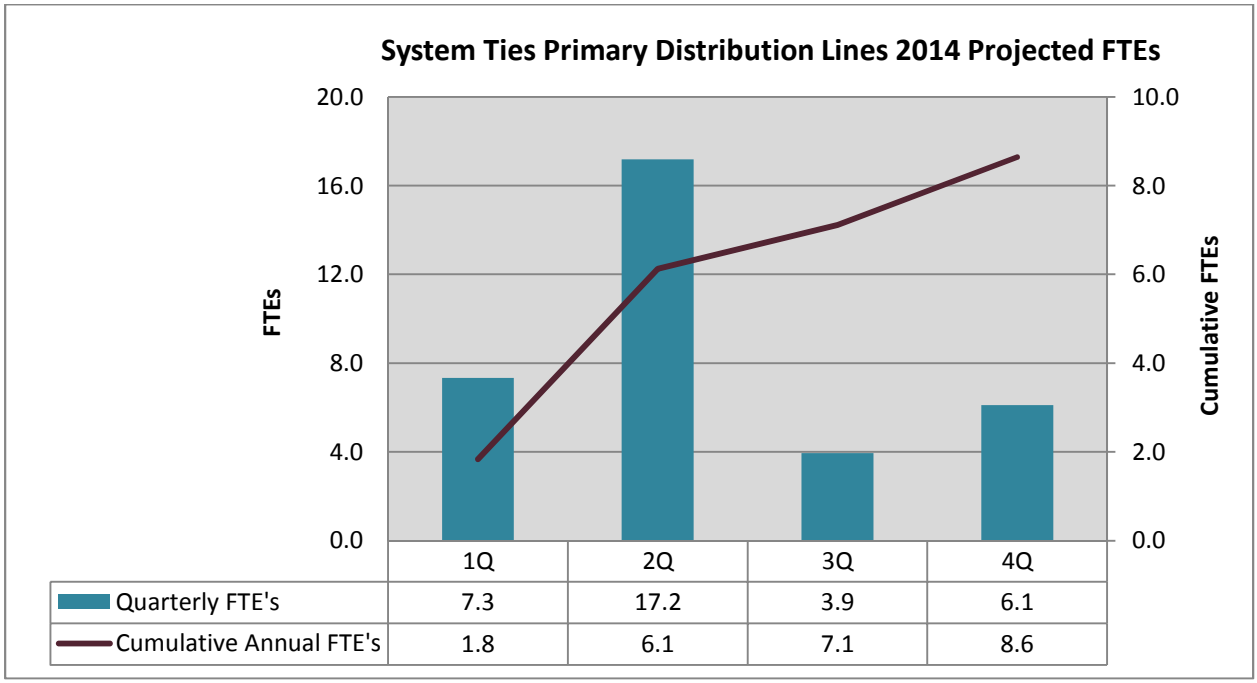
Figure 1.P.2: System Ties Primary Distribution Lines 2014 Capital Investments



1.P.3: 2014 Program FTEs

Figure 1.P.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

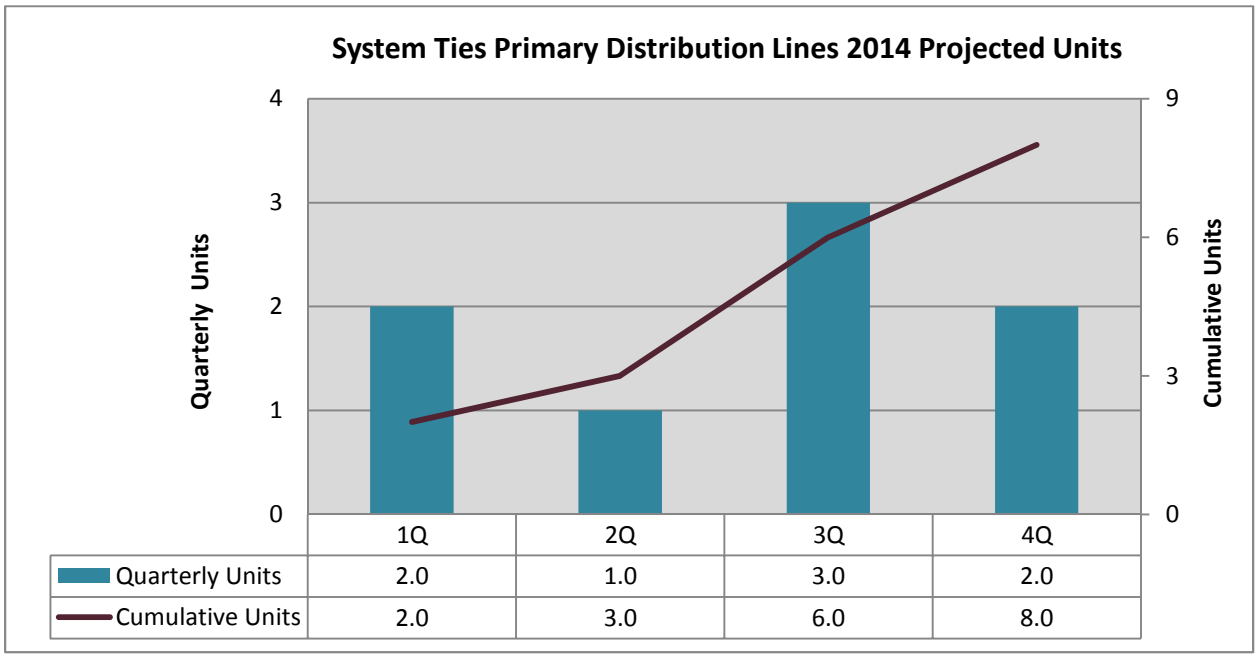
Figure 1.P.3: System Ties Primary Distribution Lines 2014 FTEs



1.P.4: Program Units

Figure 1.P.4 shows the units to be replaced in 2014 under this program. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown are projects.

Figure 1.O.4: System Ties Primary Distribution Lines Units



Section 1.Q: CERT Remediation

1.Q.1: 2014 Program Scope

The program specifically targets existing CERT and potential CERT customers that have exceeded the reliability criteria for two consecutive years. These projects may include such items as rebuilding portions of distribution circuits, building new circuit ties, or installation of targeted distribution automation schemes.

These projects were generally selected on the bases of:

1. Number of existing or potential CERT customers
2. Historical outage information
3. Scope of each individual project
4. Workload management

1.Q.2: 2014 Program Capital Investments

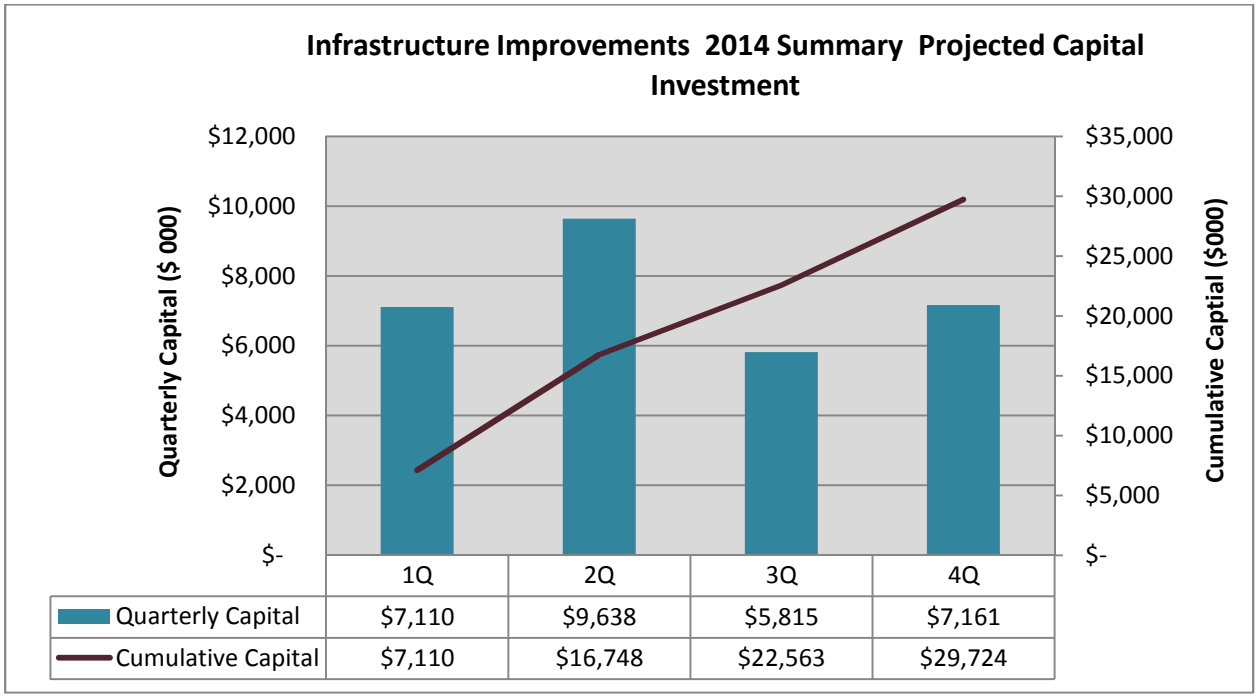
There are no projected capital expenditures expected in this program for 2014.

Section 1.R: Infrastructure Improvement Summary

1.R.1: Summary Capital Expenditures

Figure 1.R.1 represents the projected total capital expenditures for the Infrastructure Improvement programs under the Infrastructure and Modernization portion of the Act, excluding the Training Facilities. The Training Facilities are shown separately. AIC estimates the summary cost to be $29.7 million in capital investment, plus associated expenses over the program period. Estimates of cost, scope of work, and schedules for that work may evolve over time.

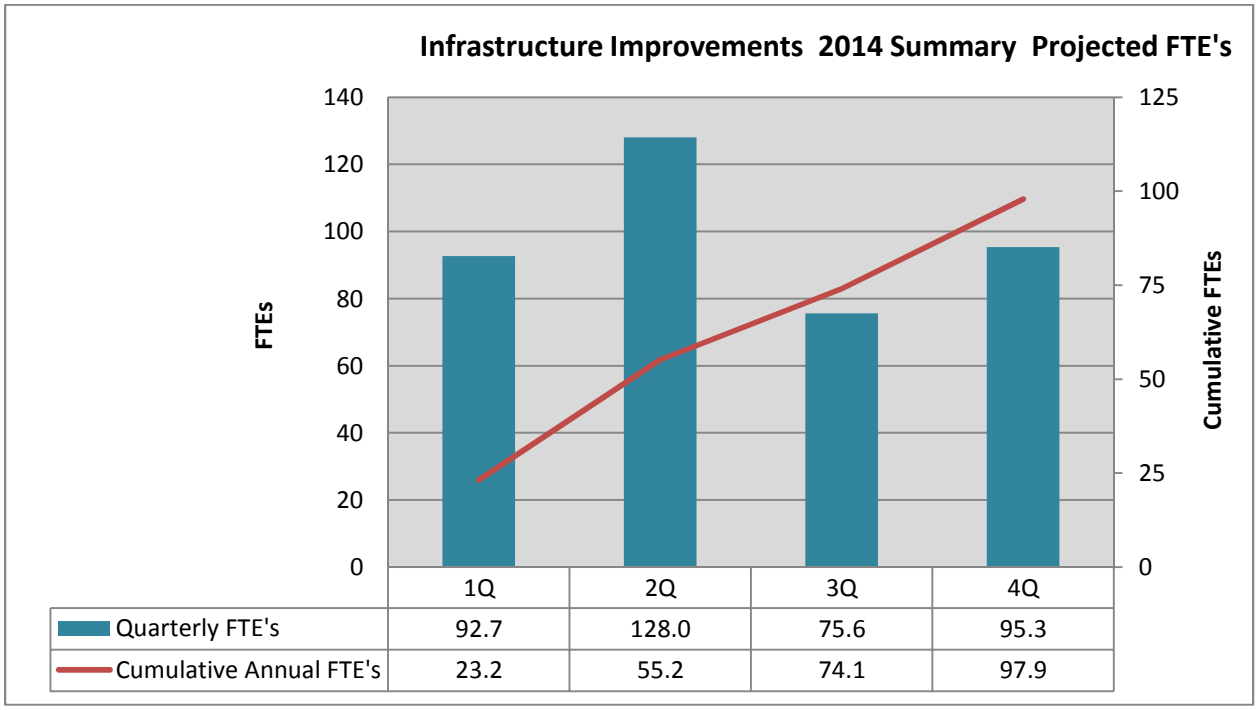
Figure 1.R.1: Infrastructure Improvement Summary 2014 Capital Investments



1.R.2: Program FTEs

Figure1.R.2 represents the projected FTEs required to perform the scheduled scope of work. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 1.R.2: Infrastructure Improvement Summary 2014 FTEs



Section 2: Training Facilities

Section 2A: Training Facilities

2.A.1: 2014 Program Scope

There are no projected expenditures under this program in 2014.

Section 3: Distribution Automation Programs

Section 3.A: Primary Distribution Automation

3.A.1: 2014 Program Scope

This program is designed to install primary distribution level automation schemes in a self- isolating mode. In some cases smart switching devices will be installed in order to facilitate the automatic isolation of the faulted section and restoration of the remaining load. In addition to installation of the appropriate line devices, this program will install metering and control on the distribution substation equipment if not equipped.

Benefits include, where possible, the limiting of the aggregate load experiencing a permanent outage due to a fault on a primary distribution backbone feeder to approximately half the load of the feeder. In some cases in may also avoid the loss of an entire feeder load due to the loss of supply, such as a substation bus, transformer, or high voltage distribution line.

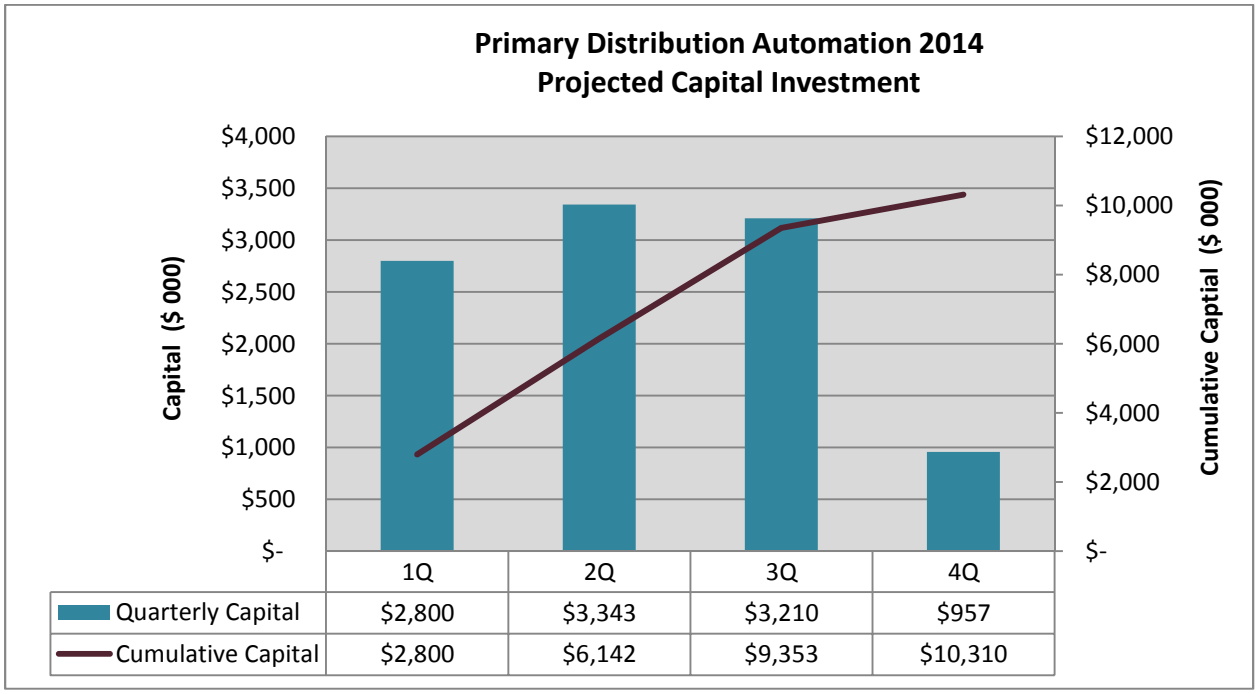
These projects were generally selected on the basis of:

1. Greatest number of customers
2. Historical outage information
3. Complexity of the project
4. Communication infrastructure requirements
5. Workload management

3.A.2: 2014 Program Capital Investments

Figure 3.A.2 represents the projected capital expenditures for this program in 2014. AIC estimates the 2014 program cost to be approximately $10.3 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

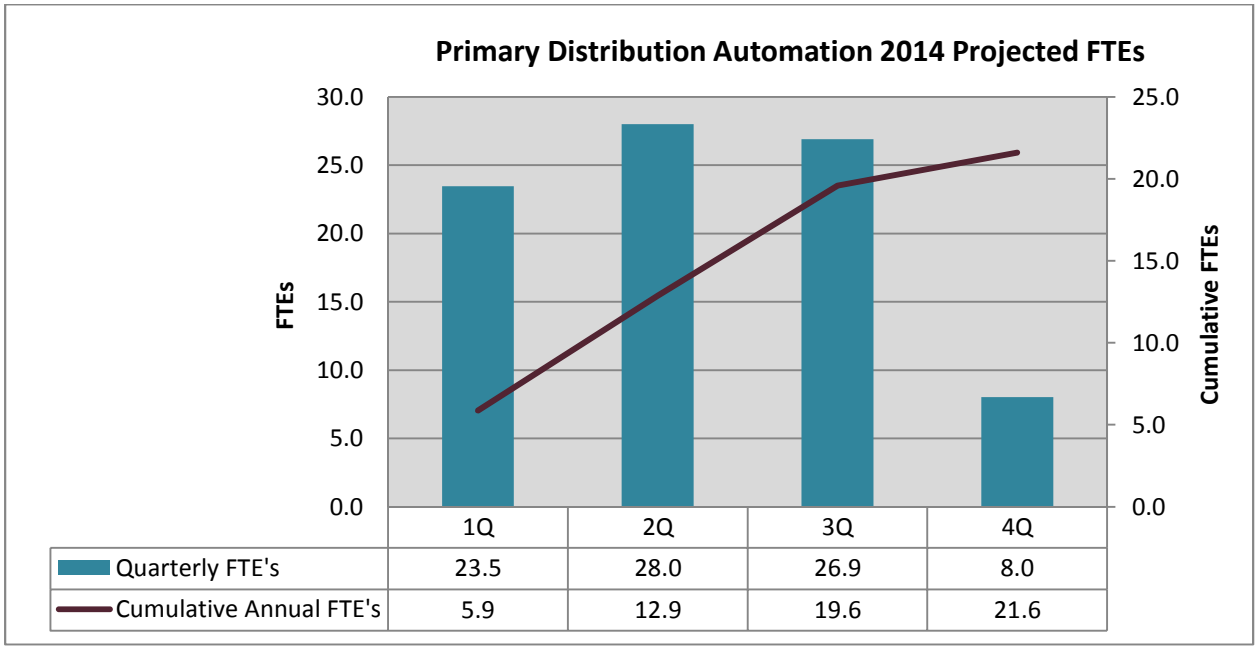
Figure 3.A.2: Primary Distribution Automation 2014 Capital Investments



3.A.3: 2014 Program FTEs

Figure 3.A.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 3.A.3: Primary Distribution Automation 2014 FTEs

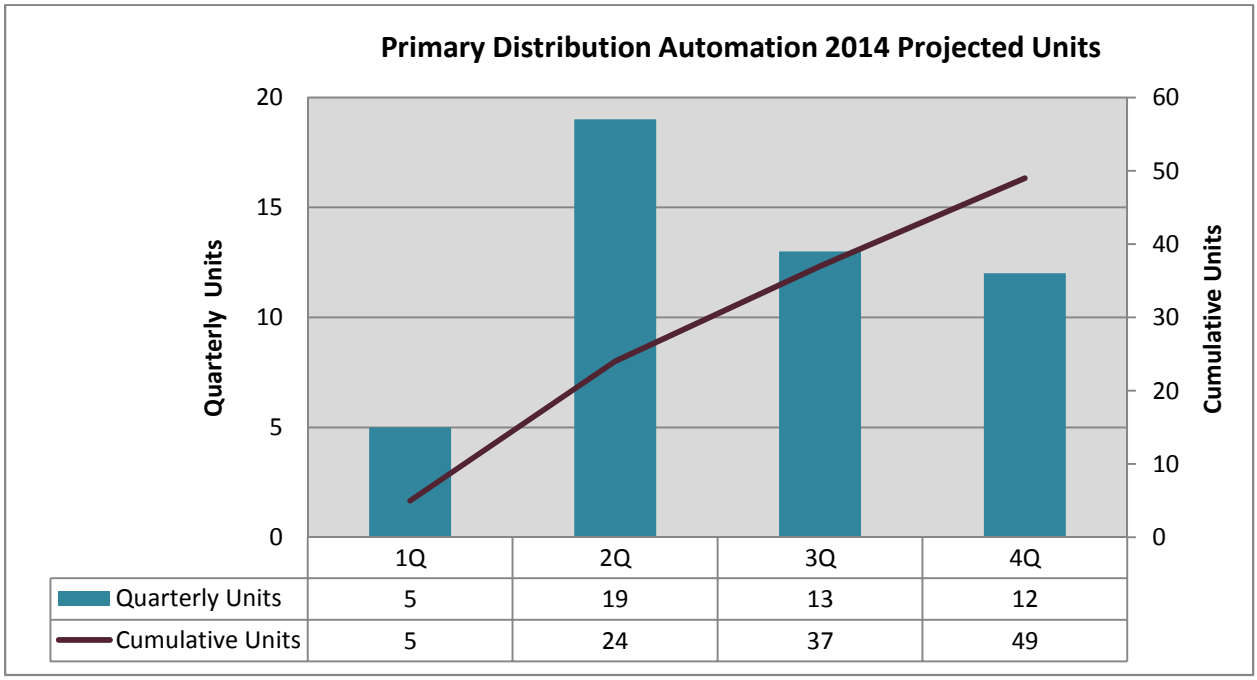


	1Q	2Q	3Q	4Q
Quarterly FTE's	23.5	28.0	26.9	8.0
Cumulative Annual FTE's	5.9	12.9	19.6	21.6

3.A.4: Program Schedule/Units

Figure 3.A.4 shows the number of units to be completed in 2014 under this program. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown are projects.

Figure 3.A.4: Primary Distribution Automation 2014 Units



Section 3.B: Communication Infrastructure

3.B.1: 2014 Program Scope

The AIC's Communications Infrastructure program is foundational to allowing the other Smart Grid programs to obtain their desired benefits. This program will focus on delivering secure, performance-driven communications solution(s). The program will leverage a combination of different communication technologies due to tradeoffs in cost, coverage, bandwidth, latency, reliability, etc. Both public cellular and private RF communications will be converged, as appropriate, onto Internet Protocol (IP) based architecture.

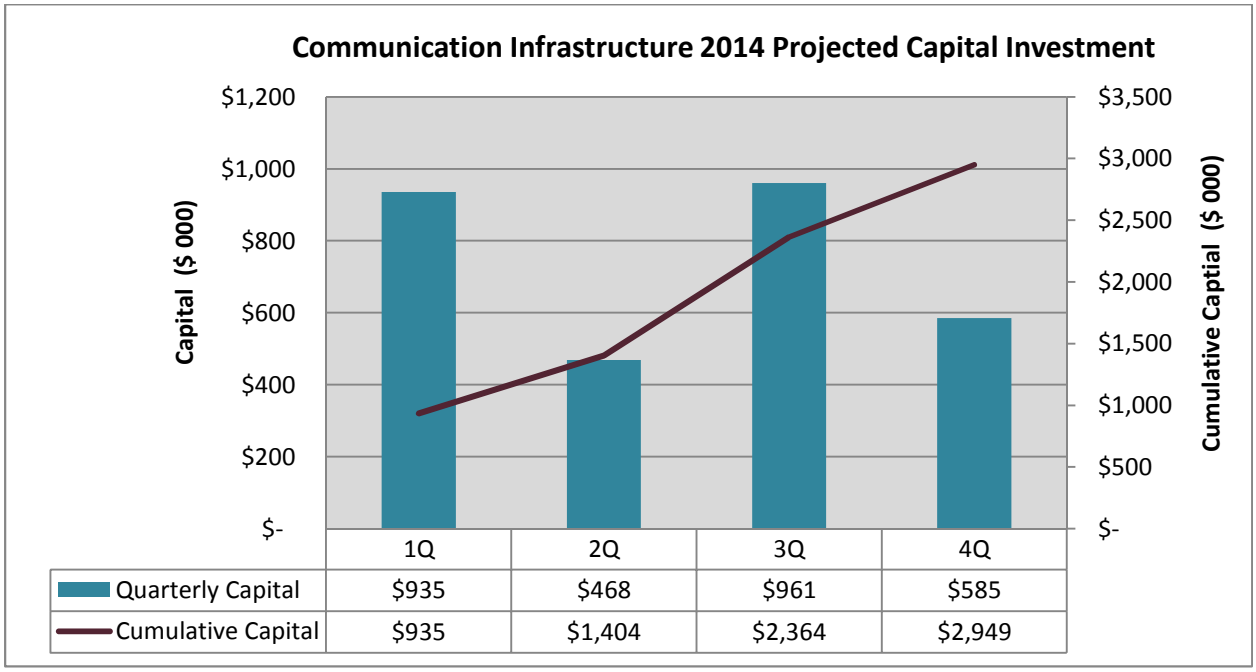
Year 2014 will continue the planning, design and procurement phases for the AIC Smart Grid Communications Network (SGCN). The design and deployment activities will address the core SGCN requirements of performance, security, manageability, upgradeability, and reliability as aligned with the smart grid application(s) being supported. Multi-layered network communications models will incorporate Internet Protocol (IP) services to 1) ensure maximum interoperability based upon current standards that are both available and generally accepted as best practice and 2) to the maximum extent possible, comply with standards that have been deemed relevant by National Institute of Standards and Technology (NIST) and the Smart Grid Interoperability Panel (SGIP). As mentioned previously, not only will both public and private wireless services be used, but also wired technologies will be leveraged as appropriate to continue to address performance and cyber security requirements, as well as to optimize costs. Cyber security (to include, but not be limited to, the implementation of best-practice security processes, procedures, standards and technologies) will be incorporated from an end-to-end, holistic perspective starting in the initial years of planning, design and deployment. The footprint of the private wireless will be expanded to cover a larger portion of the AIC territory with addition of two new master radio locations. This will reduce overall long-term cost and

increase responsiveness to provide secure control for field distribution automation control applications. Newer high-bandwidth wireless technologies are being explored that will provide low latency communication and the ability to handle additional capacity such as video surveillance. Also, being reviewed is how the Network Operations Center (NOC) will be enhanced to provide service to a larger footprint in monitoring increased network communications end points as well as the addition of AMI communications infrastructure.

3.B.2: 2014 Program Capital Investments

Figure 3.B.2 represents the projected 2014 capital expenditures for this program. AIC estimates the 2014 program cost to be approximately $2.9 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

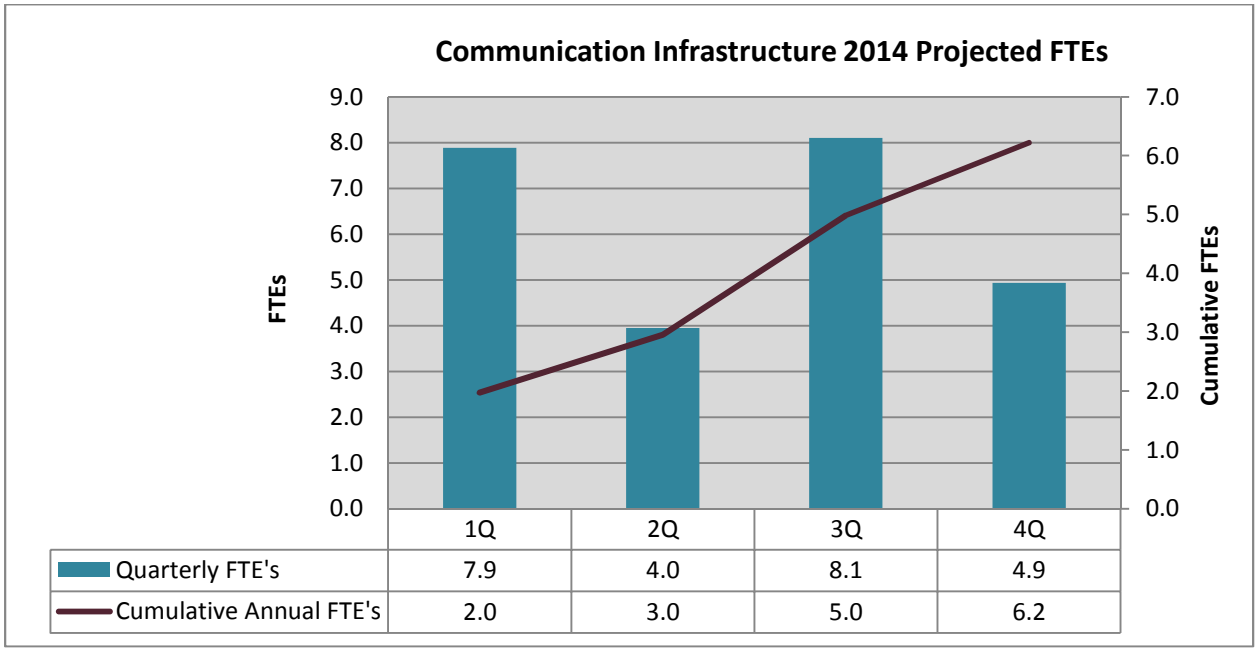
Figure 3.B.2: Communication Infrastructure 2014 Capital Investments



3.B.3: 2014 Program Schedule/FTEs

Figure 3.B.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 3.B.3: Communication Infrastructure 2014 FTEs



	1Q	2Q	3Q	4Q
Quarterly FTE's	7.9	4.0	8.1	4.9
Cumulative Annual FTE's	2.0	3.0	5.0	6.2

Section 3.C: High Voltage Distribution Relaying

3.C.1: 2014 Program Scope

This program is to replace obsolete electro-mechanical relays on the high voltage distribution system with microprocessor based relays. Some of the expected benefits are

1. Provide distance to fault data to system control to accelerate outage restoration
2. Relay health status continuously monitored by SCADA
3. Detailed fault data for post disturbance evaluation
4. Reduced maintenance due to longer testing intervals.

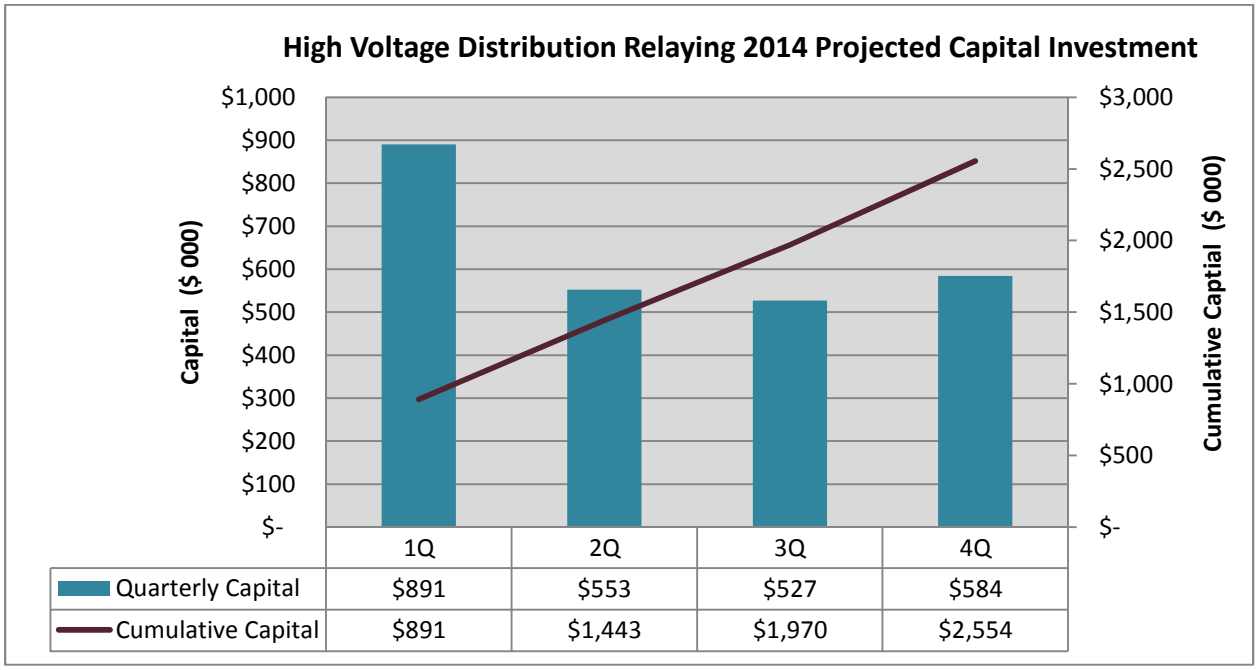
Project selection is generally based on.

1. Historical performance.
2. Greatest number of customers
3. Complexity of project
4. Workload management

3.C.2: 2014 Program Capital Investments

Figure 3.C.2 represents the projected 2014 capital expenditure for this program. AIC estimates the 2014 program cost to be approximately $2.6 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

Figure 3.C.2: High Voltage Distribution Relaying 2014 Capital Investments

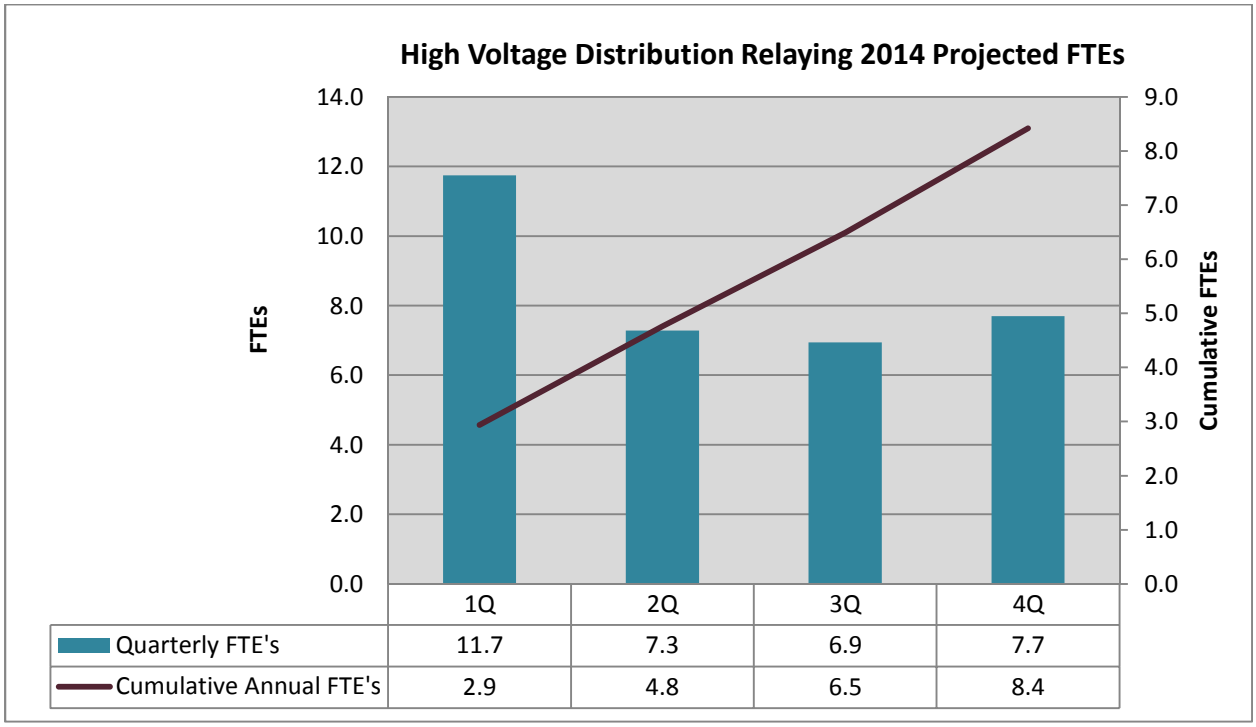


	1Q	2Q	3Q	4Q
Quarterly Capital	$891	$553	$527	$584
Cumulative Capital	$891	$1,443	$1,970	$2,554

3.C.3: 2014 Program FTEs

Figure 3.C.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 3.C.3: High Voltage Distribution Relaying 2014 FTEs

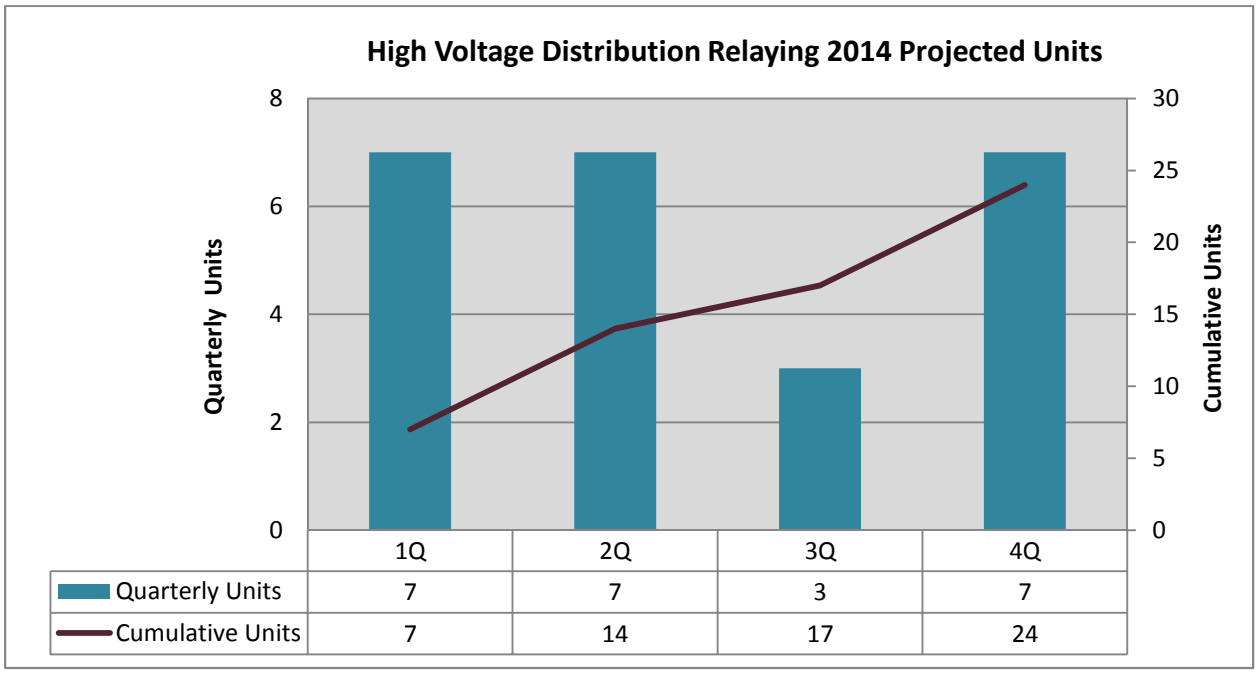


	1Q	2Q	3Q	4Q
Quarterly FTE's	11.7	7.3	6.9	7.7
Cumulative Annual FTE's	2.9	4.8	6.5	8.4

3.C.4: Program Schedule/Units

Figure 3.C.4 shows the number of units to be completed in 2014 under this program. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown are terminals.

Figure 3.C.4: High Voltage Distribution Relaying 2014 Units



Section 3.D: Distribution Substation Metering

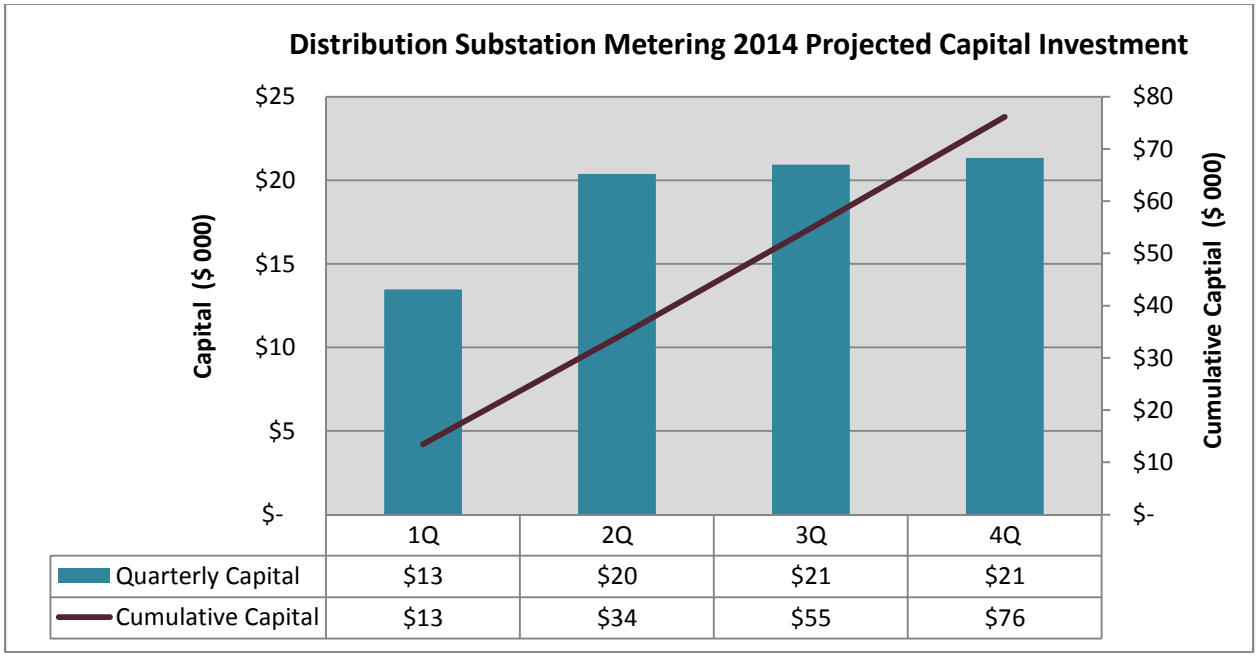
3.D.1: 2014 Program Scope

This program will add distribution substation transformer and circuit load metering at select substations that currently do not have remote read capability. These meters will be remotely read and reported through the SCADA system. Benefits include the ability to accurately collect load information for engineers to determine the most efficient options for upgrading the electric system.

3.D.2: 2014 Program Capital Investments

Figure 3.D.2 represents the projected 2014 capital expenditure for this program. AIC estimates the 2014 program cost to be approximately $76,000 in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

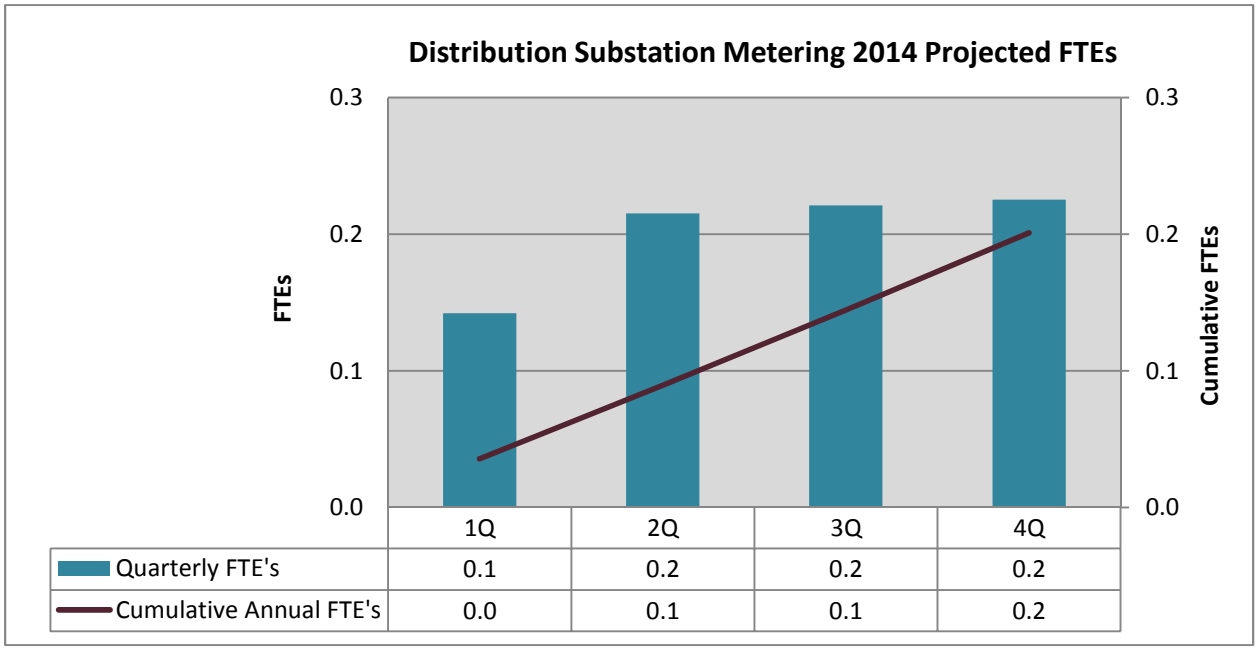
Figure 3.D.2: Distribution Substation Metering 2014 Capital Investments



3.D.3: 2014 Program FTEs

Figure 3.D.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 3.D.3: Distribution Substation Metering 2014 FTEs



3.D.4: Program Schedule/Units

The investment under this program in 2014 is for engineering only. No units will be installed.

Section 3.E: High Voltage Distribution Automation

3.E.1: 2014 Program Scope

This program will install smart switching devices on the high voltage distribution system in order to facilitate the automatic isolation of faulted line sections and the restoration of the remaining loads. It also includes the installation of remote fault current indicators (FCI) at select locations to help identify fault location. Benefits include a reduction in the amount of customers experiencing an extended outage, and faster fault location.

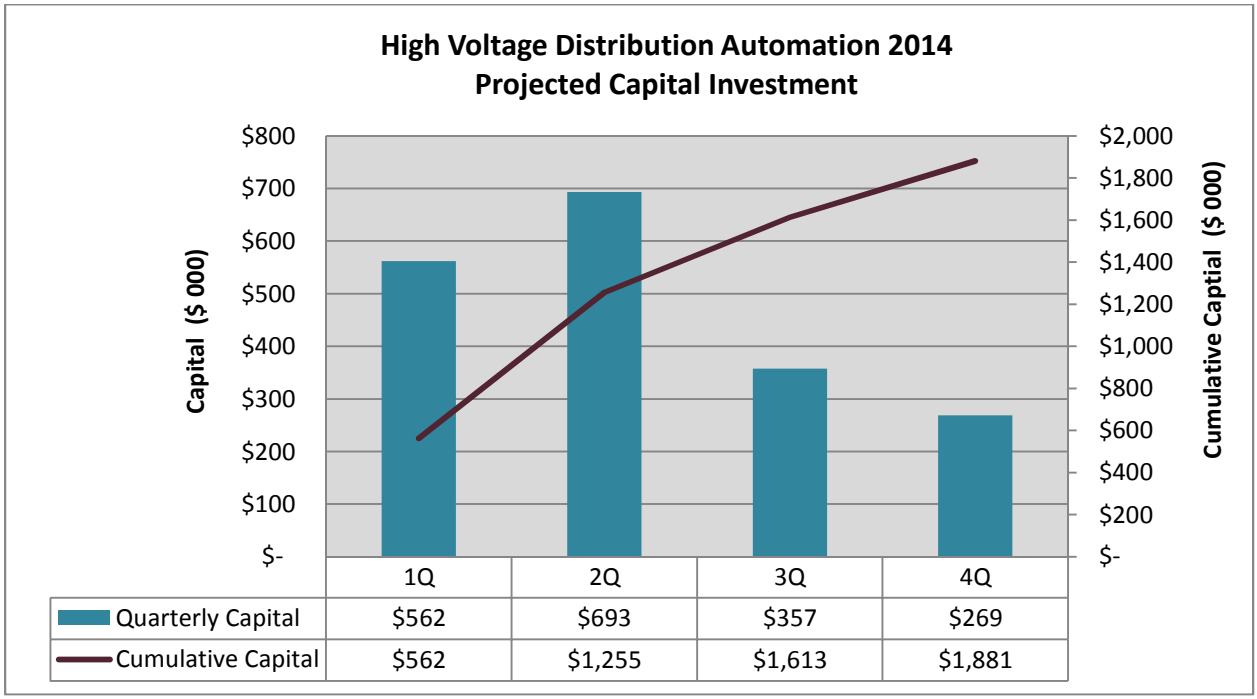
Projects were generally selected on the basis of:

1. Greatest number of customers
2. Circuit configuration
3. System benefit
4. Historical outage information
5. Communication availability
6. Available resources

3.E.2: 2014 Program Capital Investments

Figure 3.E.2 represents the projected capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $1.9 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

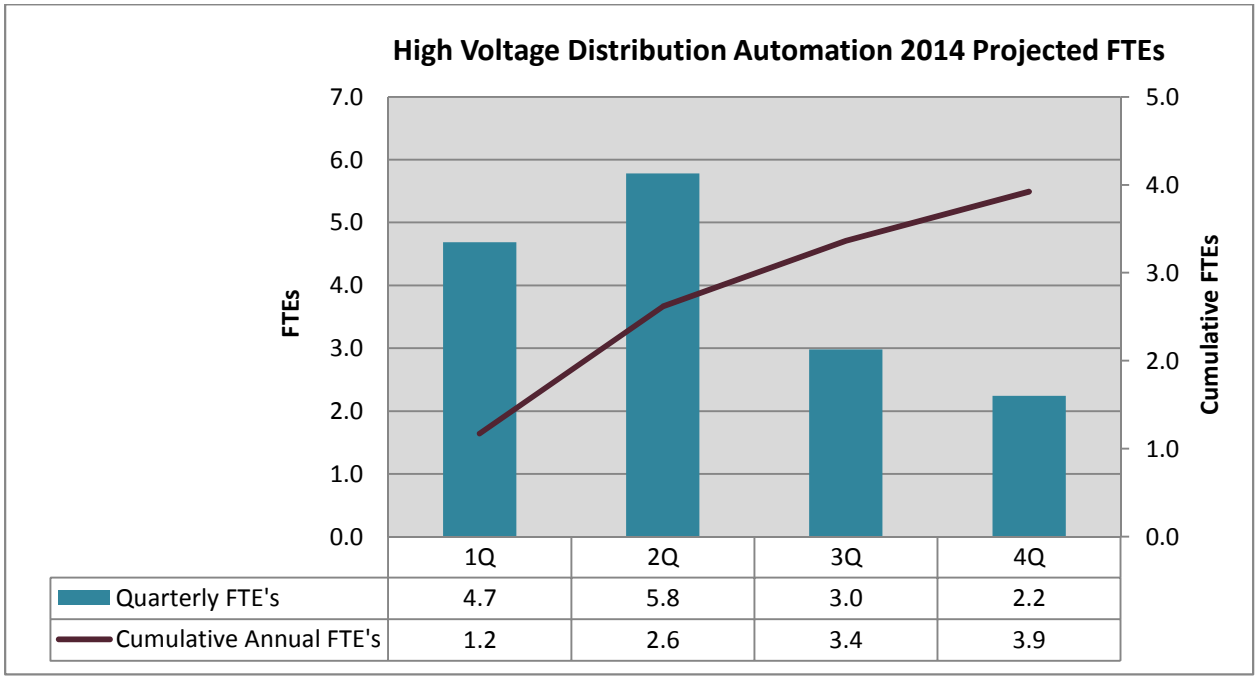
Figure 3.E.2: High Voltage Distribution Automation 2014 Capital Investments



3.E.3: 2014 Program FTEs

Figure 3.E.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

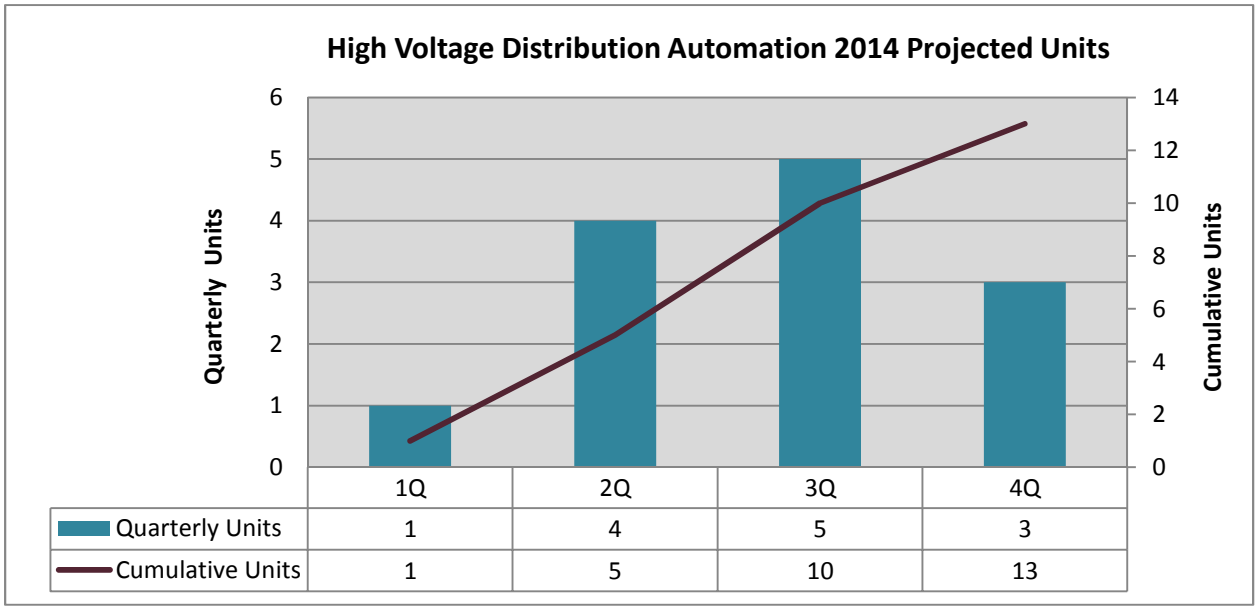
Figure 3.E.3: High Voltage Distribution Automation 2014 FTEs



3.E.4: Program Units/Schedule

Figure 3.E.4 shows the number of units to be completed in 2014 under this program. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown below are projects.

Figure 3.E.4: High Voltage Distribution Automation 2014 Units



Section 3.F: Test Bed

3.F.1: 2014 Program Scope

There are no projected expenditures under this program in 2014.

Section 3.G: Underground Network Modernization

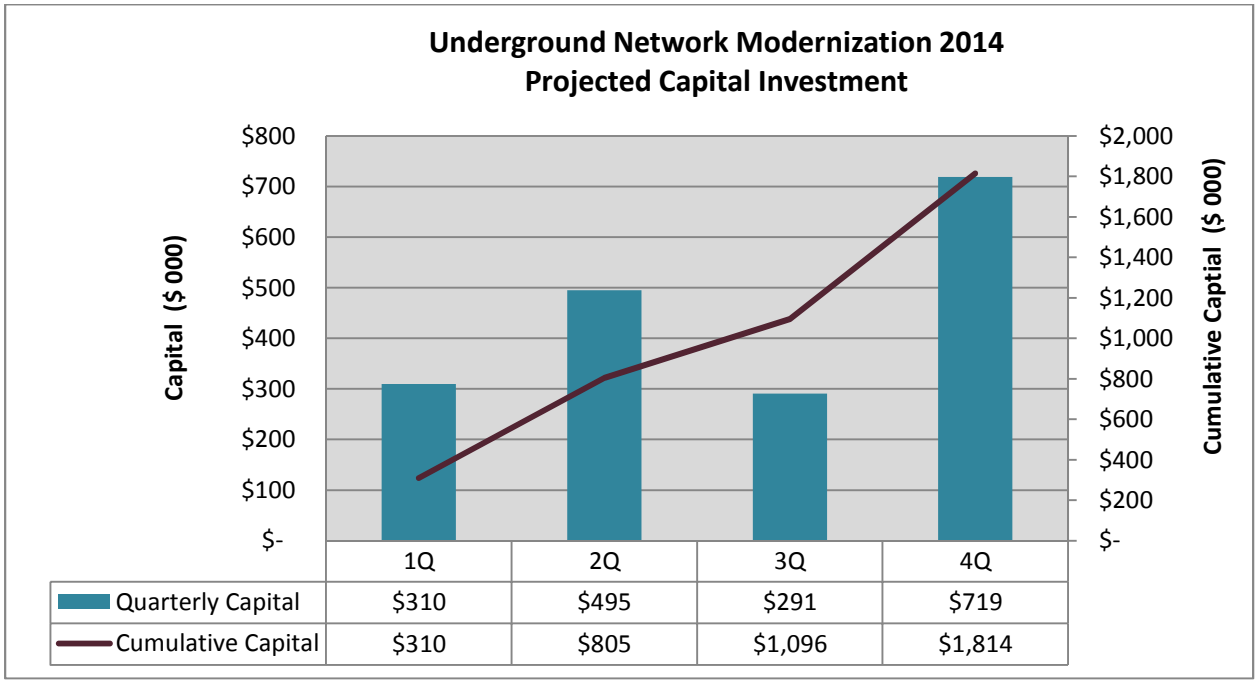
3.G.1: 2014 Program Scope

Ameren Illinois has over 150 network protectors in service. They are becoming increasingly difficult to maintain. This program is to replace the 1950 vintage network protectors with modern solid state network protectors. The new protectors will have SCADA remote communication and monitoring capabilities. This will ensure the safe isolation of network faults and allow for maintenance without time consuming switching or arc flash mitigation.

3.G.2: 2014 Program Capital Investments

Figure 3.G.2 represents the projected capital investment for this program in 2014. AIC estimates the 2014 program cost to be approximately $1.8 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

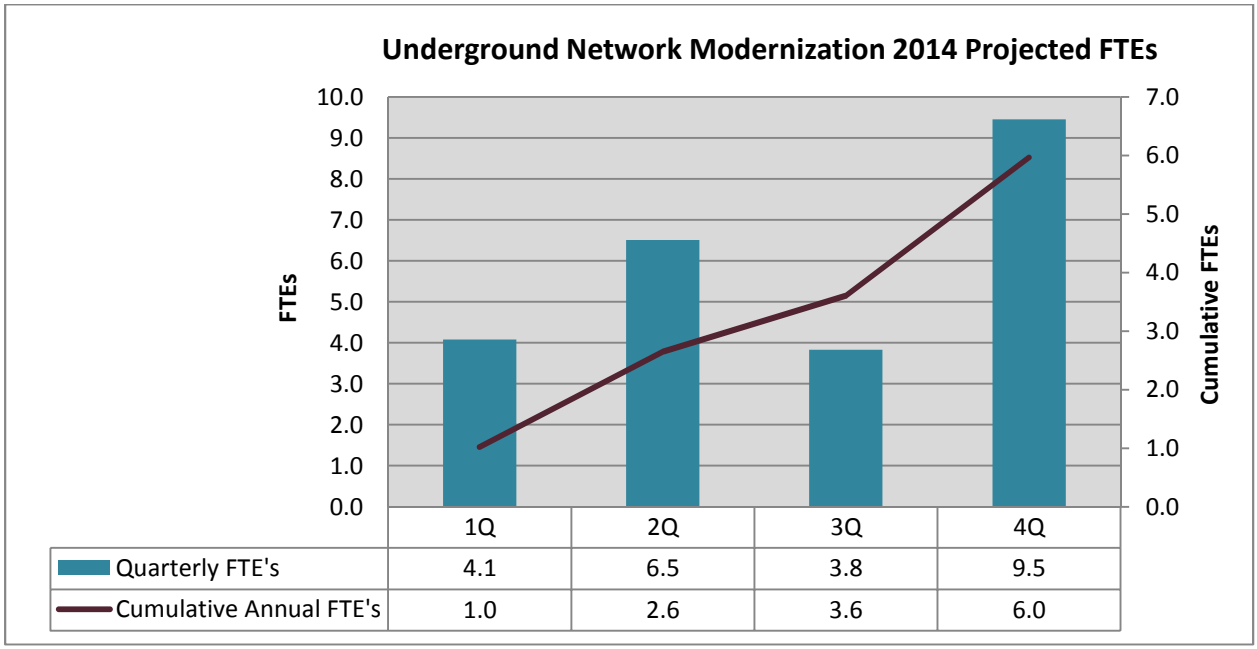
Figure 3.G.2: Underground Network Modernization 2014 Capital Investments



3.G.3: 2014 Program FTEs

Figure 3.G.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 3.G.3: Underground Network Modernization 2014 FTEs

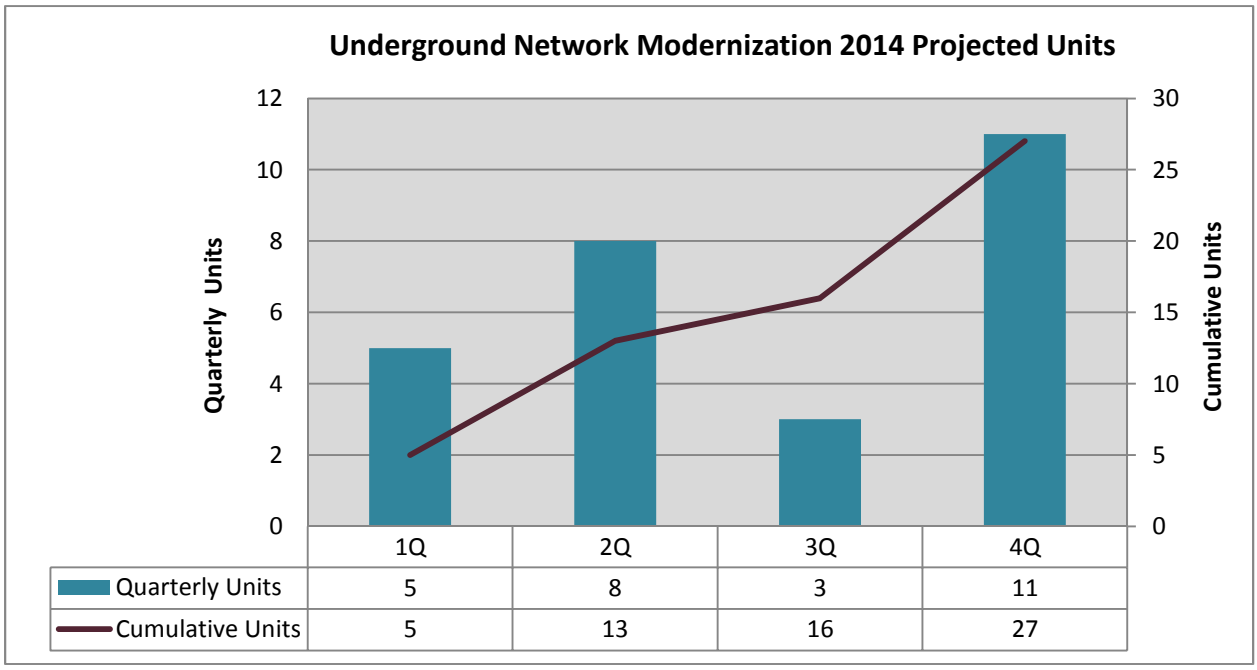


	1Q	2Q	3Q	4Q
Quarterly FTE's	4.1	6.5	3.8	9.5
Cumulative Annual FTE's	1.0	2.6	3.6	6.0

3.G.4: Program Units/Schedule

Figure 3.G.4 shows the number of units to be completed in 2014 under this program. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown below are protectors upgraded or replaced.

Figure 3.G.4: Underground Network Modernization 2014 Units

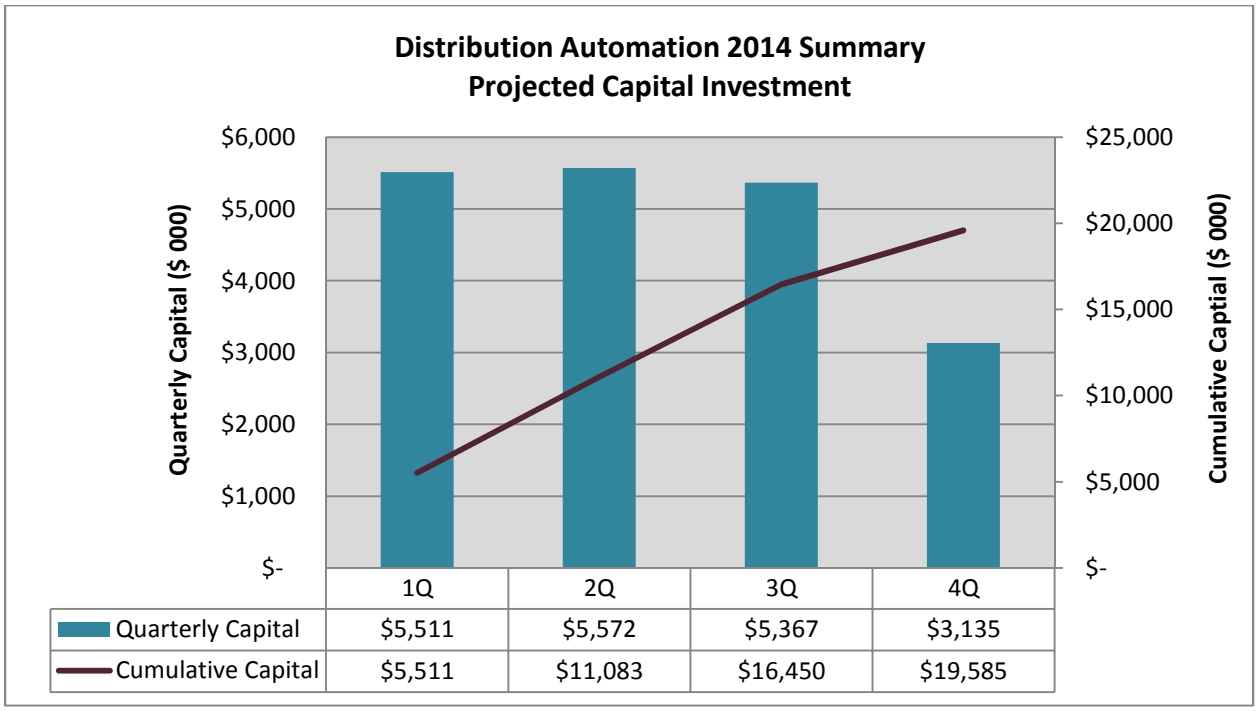


Section 3.H: Distribution Automation Summary

3.H.1: Summary Budget

Figure 3.H.1 represents the projected capital budget for the Distribution Automation portion of the Act's Smart Grid investment. It does not include the AMI program. AIC estimates the program cost to be $19.6 million in capital investment, plus associated expenses over the program period. Estimates of cost, and scope of work, and schedules for that work, may evolve over time.

Figure 3.H.1: Distribution Automation 2014 Summary Capital Investments

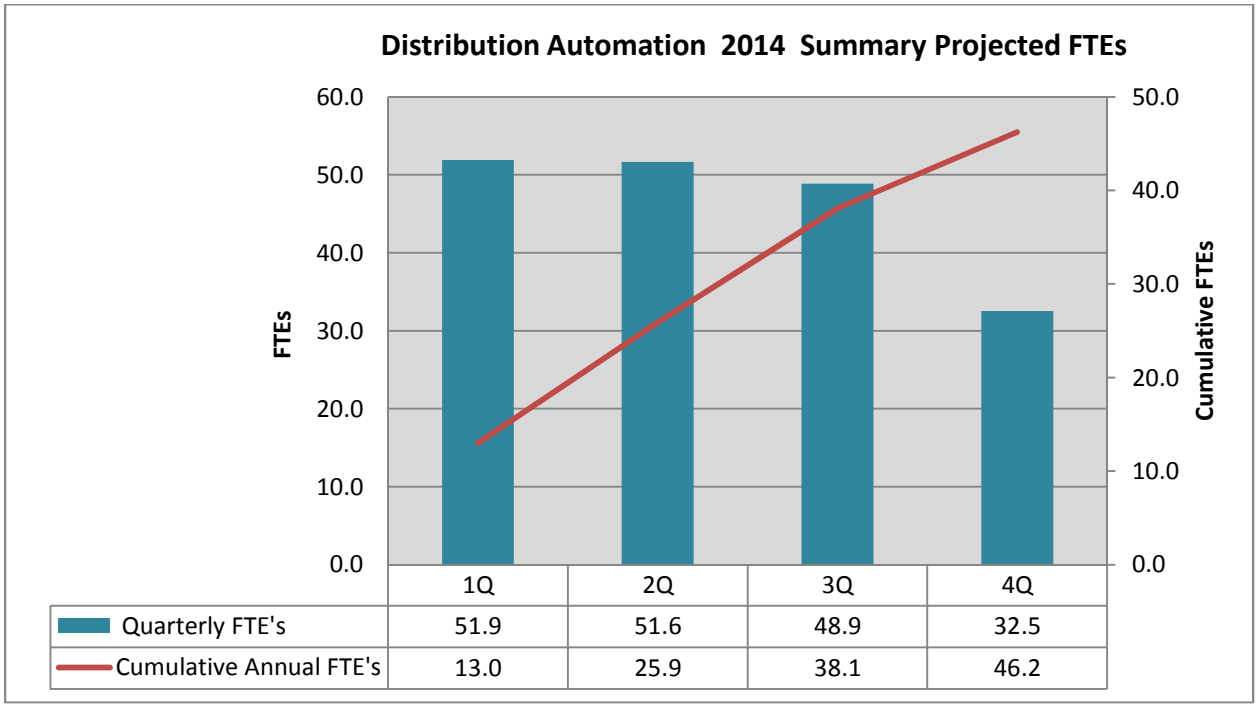


	1Q	2Q	3Q	4Q
Quarterly Capital	$5,511	$5,572	$5,367	$3,135
Cumulative Capital	$5,511	$11,083	$16,450	$19,585

3.H.2: Summary FTEs

Figure 3.H.2 represents the projected FTEs required to perform the scheduled scope of work for this summary program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 3.H.2: Distribution Automation 2014 Summary FTEs



	1Q	2Q	3Q	4Q
Quarterly FTE's	51.9	51.6	48.9	32.5
Cumulative Annual FTE's	13.0	25.9	38.1	46.2

Section 4: Advanced Metering Infrastructure (AMI)

4.A.1: 2014 Program Scope

The 2014 AMI Plan objectives are:

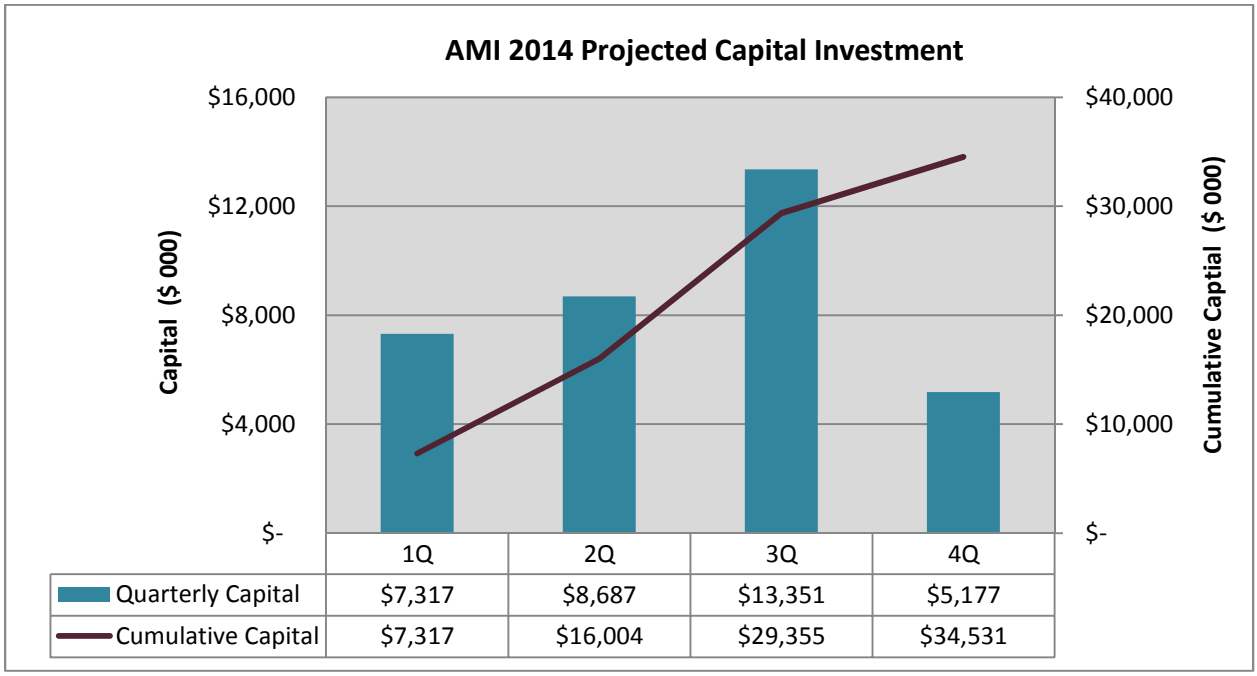
1. Complete Stage One - AMI Head End/Meter Data Management Systems Integration and customer billing
2. Begin AMI Meter/Module Deployment in June 2014
3. Develop Non-Standard Metering Service (submit tariff)
4. Detail design and implement Integrated Operations Center (initial phase)
5. Create AMI Analytics reporting
6. Implement Web Portal (residential customers)
7. Establish Customer Communications (Execute outreach initiatives for AMI deployment, continue stakeholder communications initiatives)

There are 40,000 electric AMI meters projected to be installed in 2014. A more detailed description can be found in the most recent AMI Plan as filed with the ICC, and in the AMI Plan update report submittal.

4.A.2: 2014 Program Capital Investments

Figure 4.A.2 represents the projected 2014 capital expenditures for this program. AIC estimates the 2014 program cost to be approximately $34.5 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

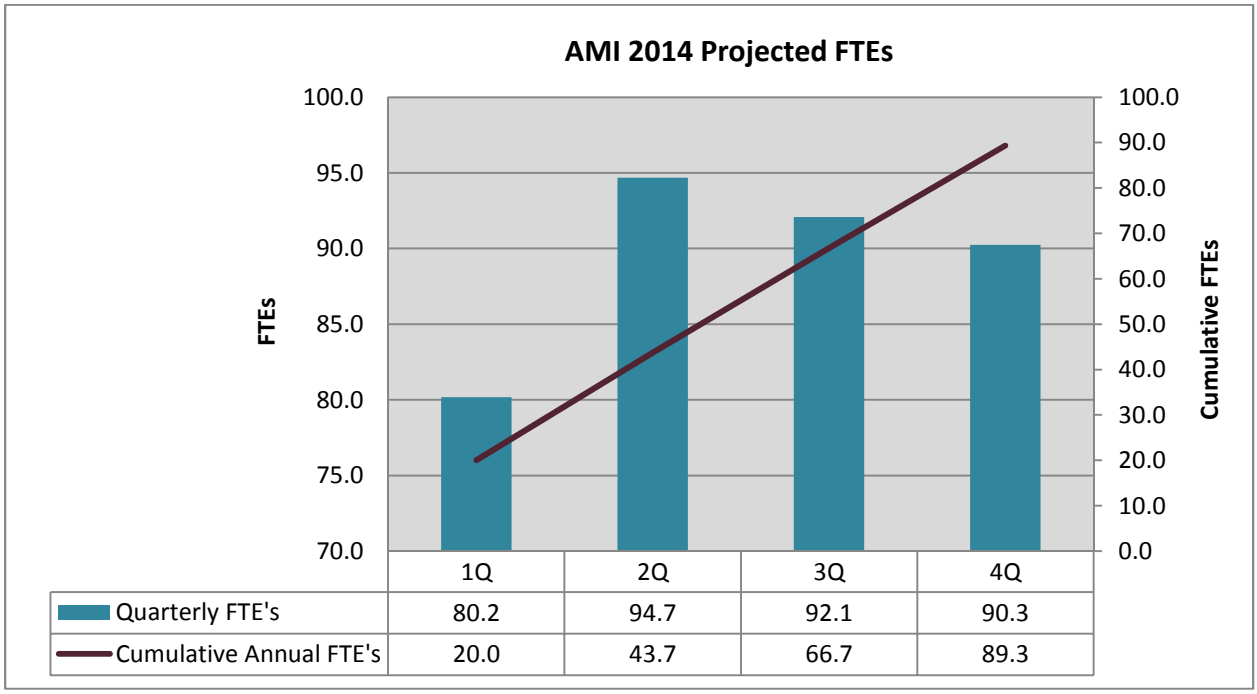
Figure 4.A.2: AMI 2014 Capital Investments



4.A.3: 2014 Program FTEs

Figure 4.A.3 represents the projected FTEs required to perform the scheduled scope of work for the AMI program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 4.A.3: AMI 2014 FTEs

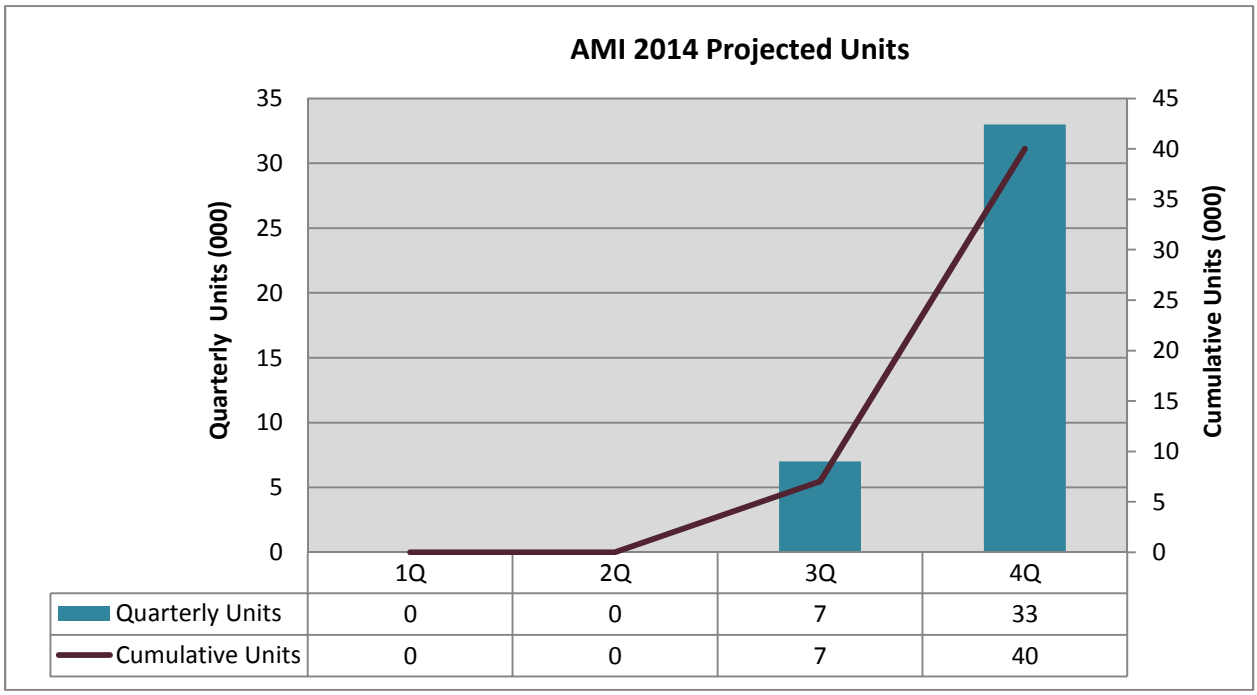


	1Q	2Q	3Q	4Q
Quarterly FTE's	80.2	94.7	92.1	90.3
Cumulative Annual FTE's	20.0	43.7	66.7	89.3

4.A.4: Program Units/Schedule

Figure 4.A.4 shows the number of meters to be installed in 2014 under this program. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown below are electric meters (in thousands).

Figure 4.A.4: Advanced Metering Infrastructure 2014 Units



	1Q	2Q	3Q	4Q
Quarterly Units	0	0	7	33
Cumulative Units	0	0	7	40

Section 5: Volt/Var Optimization

Section 5.A: High Voltage Volt/Var Control

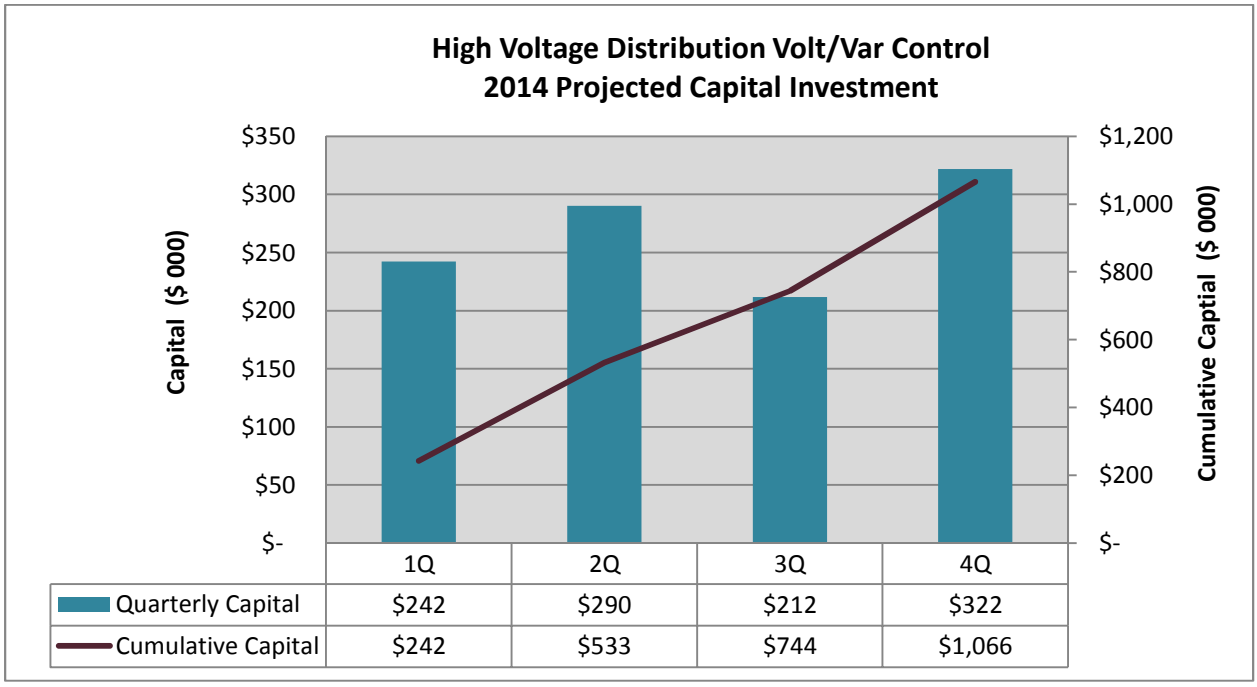
5.A.1: 2014 Program Scope

The intent of this program is to provide dynamic voltage control and optimal reactive power flow across the high voltage distribution system. Benefits include reducing energy losses due to circulating network flows and provide reduced voltage reductions to support optimal use of the system. The initial focus in on insuring all switched high voltage distribution capacitors have SCADA control and voltage indication as part of their intelligence.

5.A.2: 2014 Program Capital Investments

Figure 5.A.2 represents the projected capital expenditures for this program in 2014. AIC estimates the 2014 program cost to be approximately $1.1 million in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

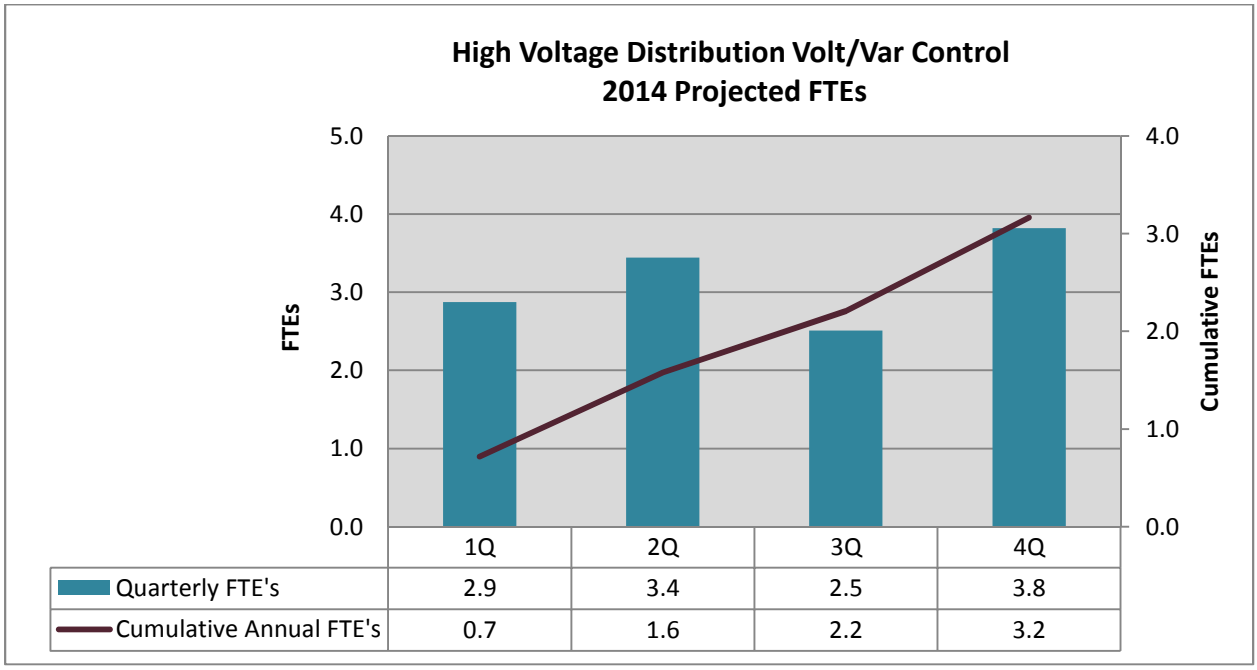
Figure 5.A.2: High Voltage Volt/Var Control 2014 Capital Investments



5.A.3: 2014 Program FTEs

Figure 5.A.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

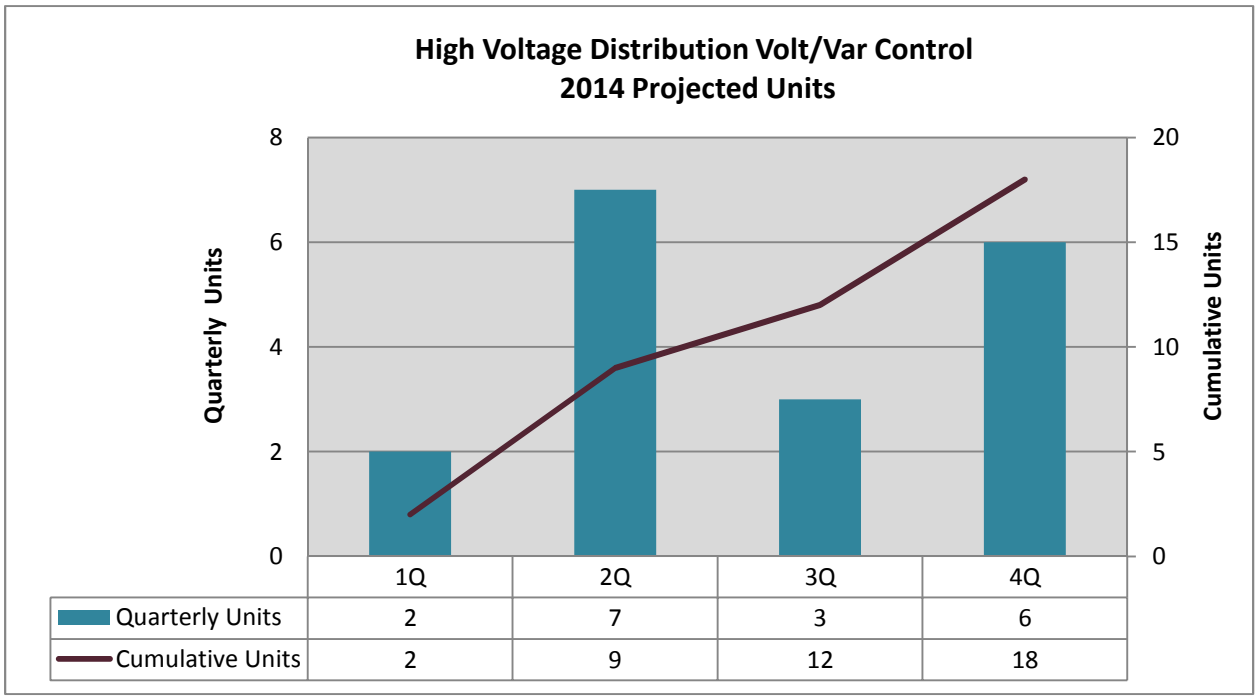
Figure 5.A.3: High Voltage Volt/Var Control 2014 FTEs



5.A.4: Program Units

Figure 5.A.4 shows the number of units to be completed under this program in 2014. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown below are projects.

Figure 5A.4: High Voltage Distribution Volt/Var Control 2014 Units



Section 5.B. Primary Distribution Volt/Var Control

5.B.1: 2014 Program Scope

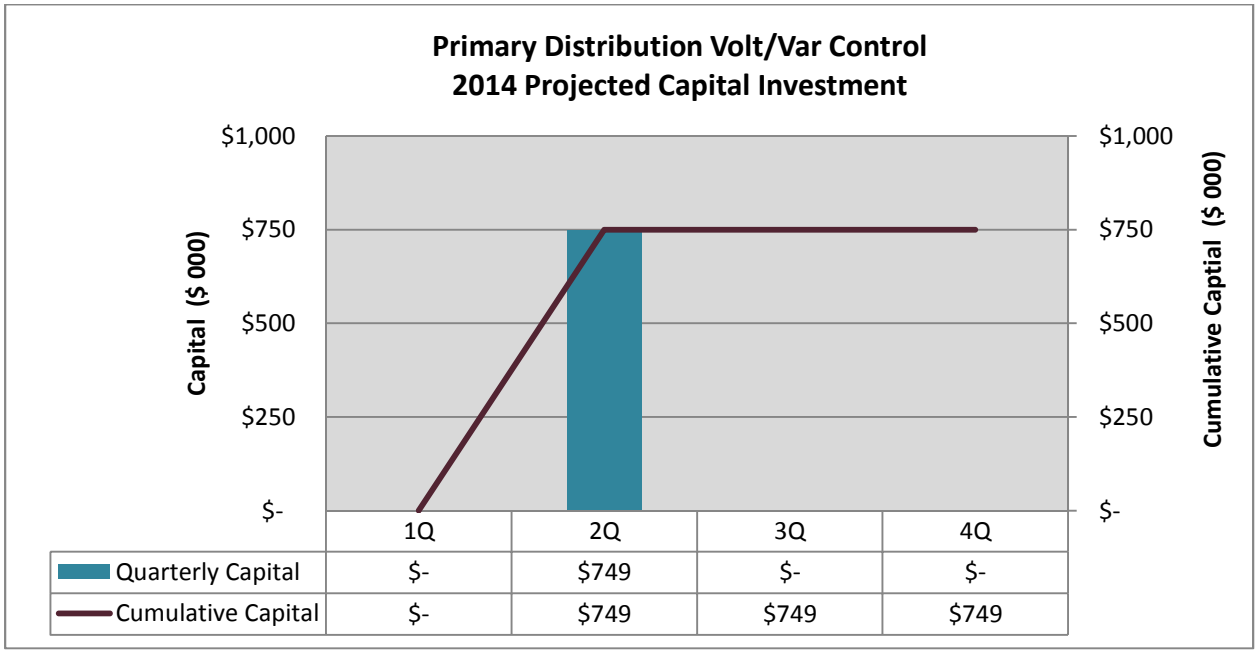
This program is intended to provide dynamic voltage control and optimal reactive power flow on select primary distribution circuits. Benefits include reducing energy losses due to circulating network flows and/or provide reduced voltage reductions to support optimal use of the system. The initial focus in on insuring all switched low voltage distribution capacitors in the metro east area currently being controlled by an obsolete system will interact with the new ADMS.

Ameren Illinois completed its conversation voltage reduction pilot in July of 2013. Results of the pilot project were shared with ICC staff on November 1, 2013. Ameren Illinois is currently studying a subset of its electric distribution circuits to determine the viability and potential locations for implementation of conservation voltage reduction control implementation. Ameren Illinois is also considering further piloting of a CVR approach that includes voltage optimization. The outcome of these studies will guide future volt/var control implementation on the Ameren Illinois electric distribution system.

5.B.2: 2014 Program Capital Investments

Figure 5.B.2 represents the projected capital expenditures for this program in 2014. AIC estimates the 2014 program cost to be approximately $749,000 in capital investment, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

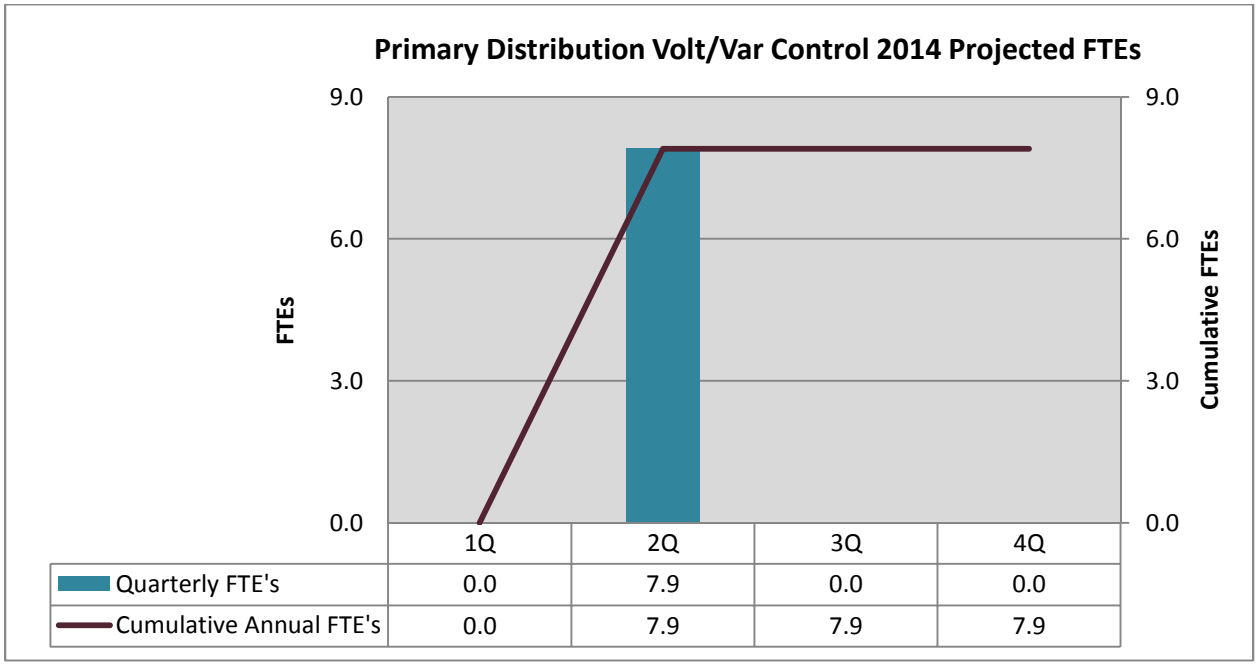
Figure 5.B.2: Primary Distribution Volt/Var Control 2014 Capital Investments



5.B.3: 2014 Program FTEs

Figure 5.B.3 represents the projected FTEs required to perform the scheduled scope of work for this program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 5.B.3: Primary Distribution Volt/Var Control 2014 FTEs

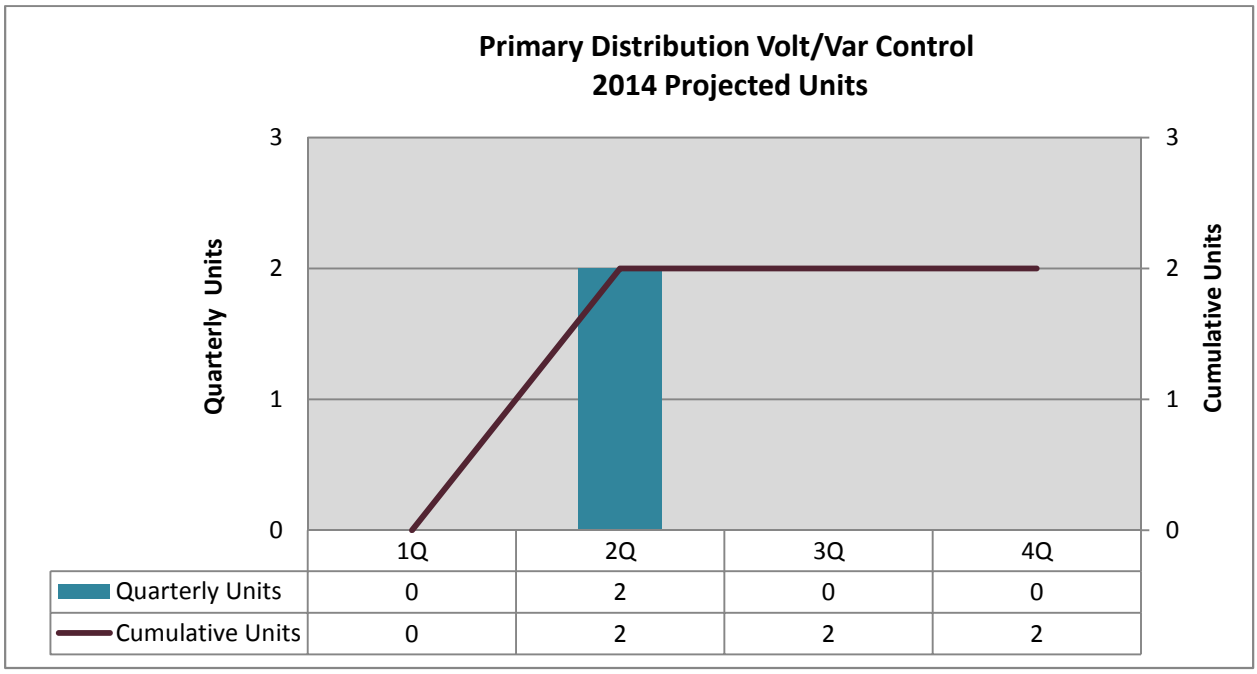


	1Q	2Q	3Q	4Q
Quarterly FTE's	0.0	7.9	0.0	0.0
Cumulative Annual FTE's	0.0	7.9	7.9	7.9

5.B.4: Program Units

Figure 5.B.4 shows the number of units to be completed under this program in 2014. This chart will serve as a tracking mechanism over the course of the year, and reflects the scope of work planned to be accomplished as well as the scope of work left to be performed. Estimates of cost, units of work, and schedules for that work may evolve over time. The units shown below are projects.

Figure 5.B.4: Primary Distribution Volt/Var Control 2014 Units



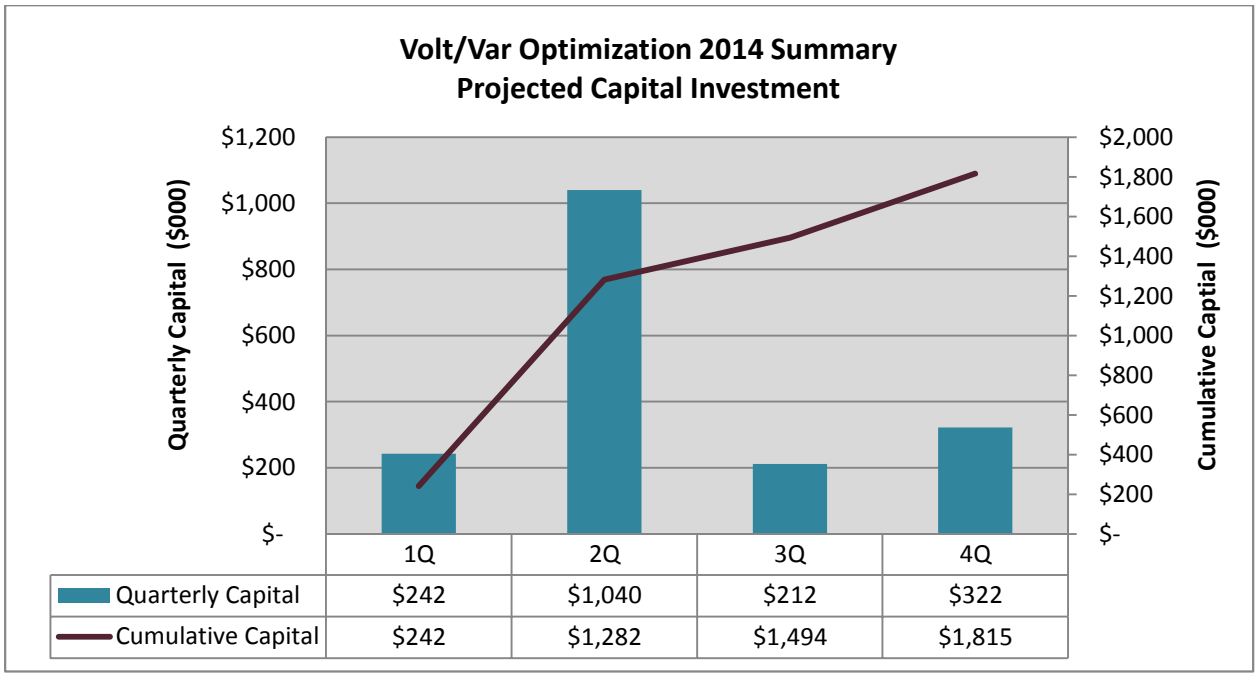
	1Q	2Q	3Q	4Q
Quarterly Units	0	2	0	0
Cumulative Units	0	2	2	2

Section 5.C: Volt/Var Optimization Summary

5.C.1: Summary Capital Investments

Figure 5.C.1 represents the projected capital expenditures for the Volt/Var Optimization programs. AIC estimates the program cost to be $1.8 million in capital investment, plus associated expenses over the program period. Estimates of cost, scope of work, and schedules for that work may evolve over time.

Figure 5.C.1: Volt/Var Optimization 2014 Summary Capital Investments

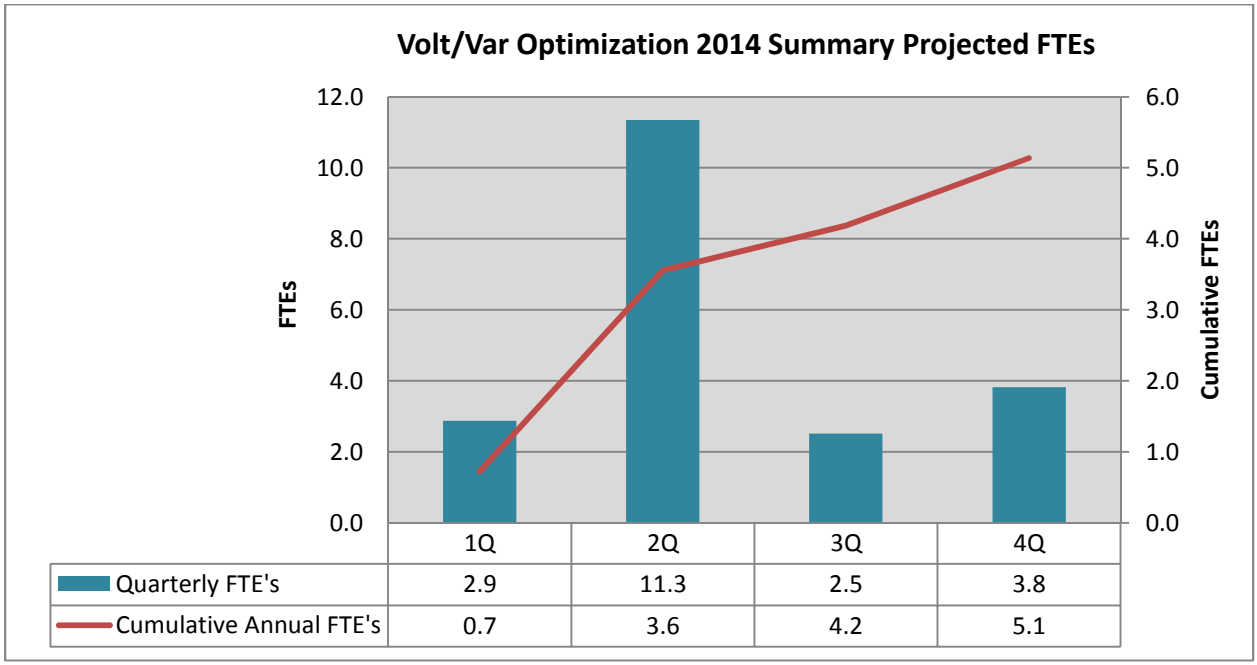


	1Q	2Q	3Q	4Q
Quarterly Capital	$242	$1,040	$212	$322
Cumulative Capital	$242	$1,282	$1,494	$1,815

5.C.2: Summary FTEs

Figure 5.C.2 represents the projected FTEs required to perform the scheduled scope of work. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, legal support, supervision and craft.

Figure 5.C.2: Volt/Var Optimization 2014 Summary FTEs



	1Q	2Q	3Q	4Q
Quarterly FTE's	2.9	11.3	2.5	3.8
Cumulative Annual FTE's	0.7	3.6	4.2	5.1

Section 6: Software and Technology Enhancements

Section 6.A: Advanced Distribution Management System (ADMS)

6.A.1: 2014 Program Scope

This program is to replace AIC's existing SCADA and DDOS systems with an Advanced Distribution Management System (ADMS). This project is composed of three implementation parts.

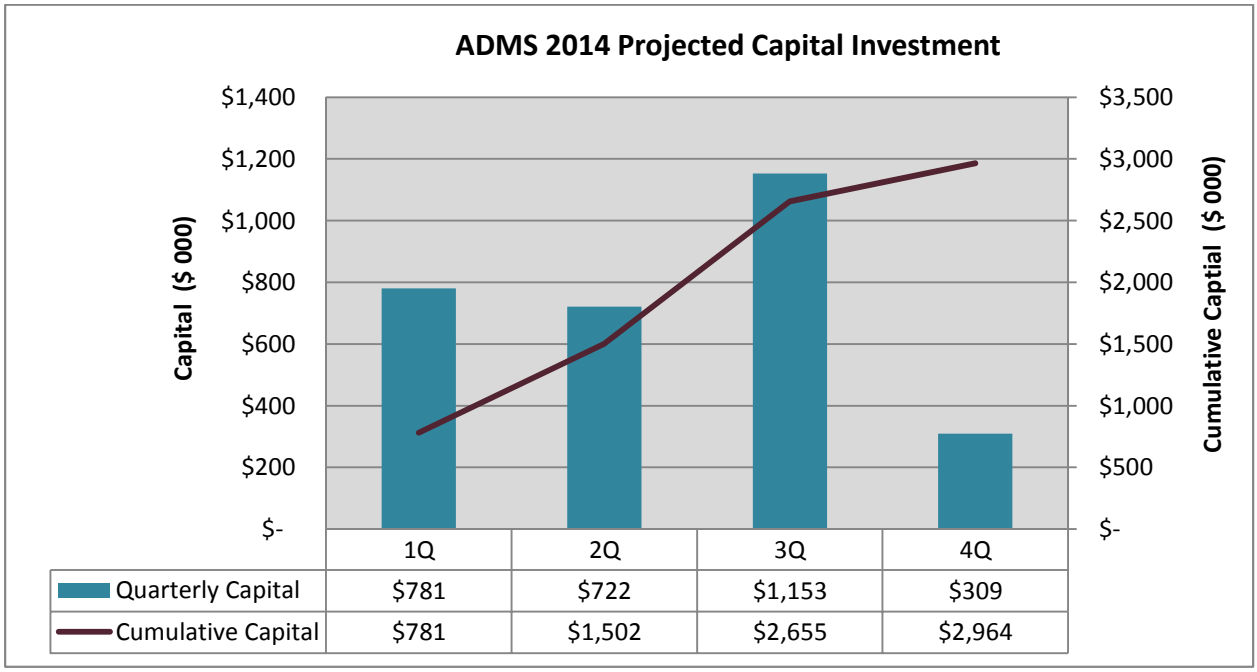
1. SCADA implementation in 3rd quarter of 2012.
2. DMS/mapping and switching implementation in 2nd quarter of 2013.
3. Outage/Mobile implementation in mid-2014.

The Ameren Illinois ADMS will improve the quality of service for the AIC customers by responding to customer service interruptions more rapidly. ADMS will improve the system dispatcher's ability to monitor and control the power system during normal, abnormal, and emergency conditions by providing reliable and appropriate real-time data from the network. Furthermore, ADMS will improve power system efficiency by helping to maintain acceptable power factors and reducing system losses, locate, isolate, and restore outages quicker. Equally important, ADMS will assist power system maintenance and safety practices by providing more reliable, meaningful, and timely records of the operating history of the power system and its field devices. Finally, ADMS will improve the ability of the engineering staff to perform power systems analysis and planning by providing increased access to past and current operations data with associated software tools.

6.A.2: 2014 Program Capital Investments

Figure 6.A.2 represents the projected 2014 capital expenditures for the ADMS program. AIC estimates the 2014 program investment to be approximately $3.0 million in capital, plus associated expenses. Estimates of cost, units of work, and schedules for that work may evolve over time.

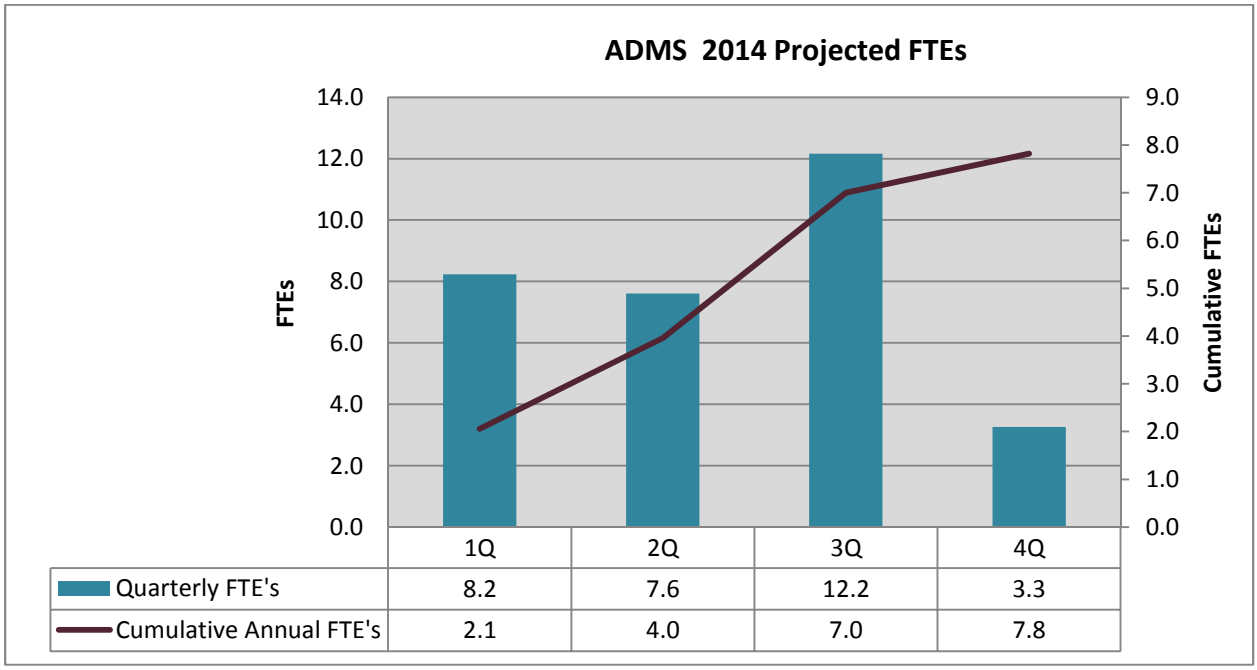
Figure 6.A.2: ADMS 2014 Capital Investments



6.A.3: 2014 Program FTEs

Figure 6.A.3 represents the projected FTEs required to perform the scheduled scope of work for the ADMS program in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, supervision and craft.

Figure 6.A.3: ADMS 2014 FTEs



Section 6.B: Replace Distribution Engineering Workstation (DEW)

6.B.1: 2014 Program Scope

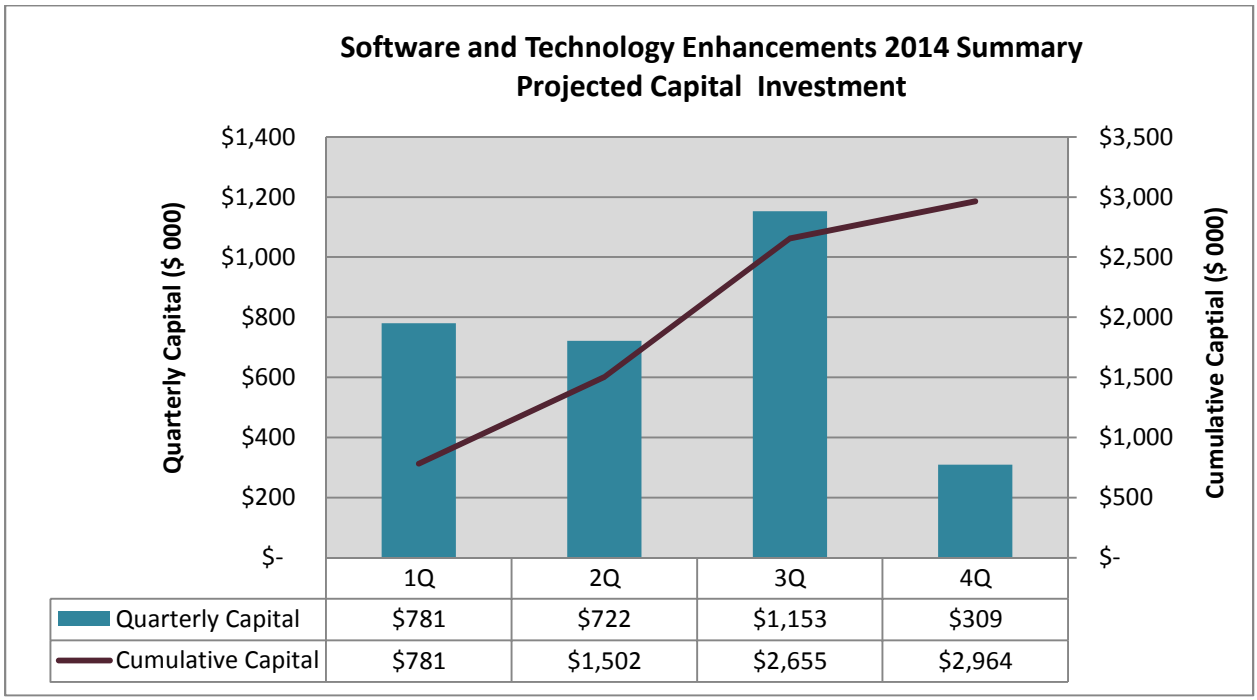
There are no projected investments associated with this project in 2014.

Section 6.C: Software and Technology Enhancements Summary

6.C.1: Summary Capital Investments

Figure 6.C.1 represents the projected capital investments for the Software and Technology Enhancements programs. AIC estimates the program cost to be $3.0 million in capital investment, plus associated expenses in 2014. Estimates of cost, scope of work, and schedules for that work may evolve over time.

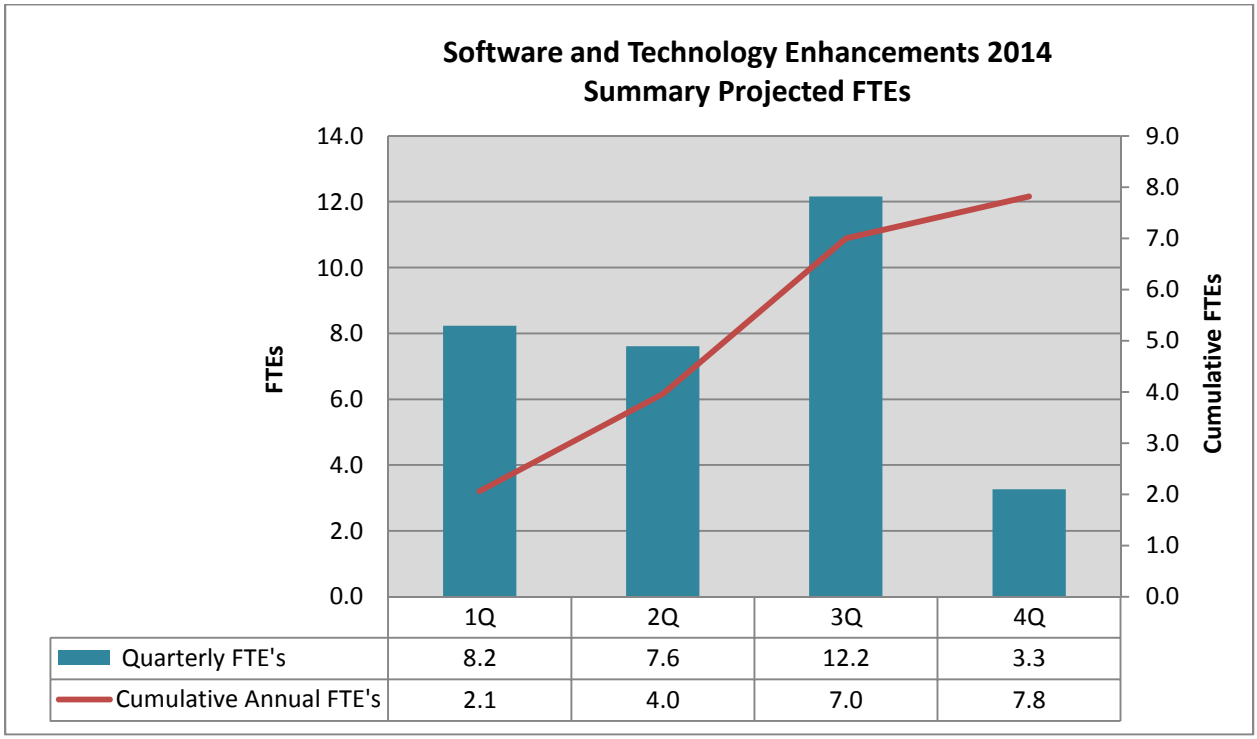
Figure 6.C.1: Software and Technology Enhancements 2014 Summary Capital Investments



6.C.2: Program FTEs

Figure 6.C.2 represents the projected FTEs required to perform the scheduled scope of work in 2014. Job classifications may include, but are not limited to, engineers, technicians, work planners, finance support, safety support, scheduling support, legal support, supervision, and craft.

Figure 6.C.2: Software and Technology Enhancements 2014 Summary FTEs

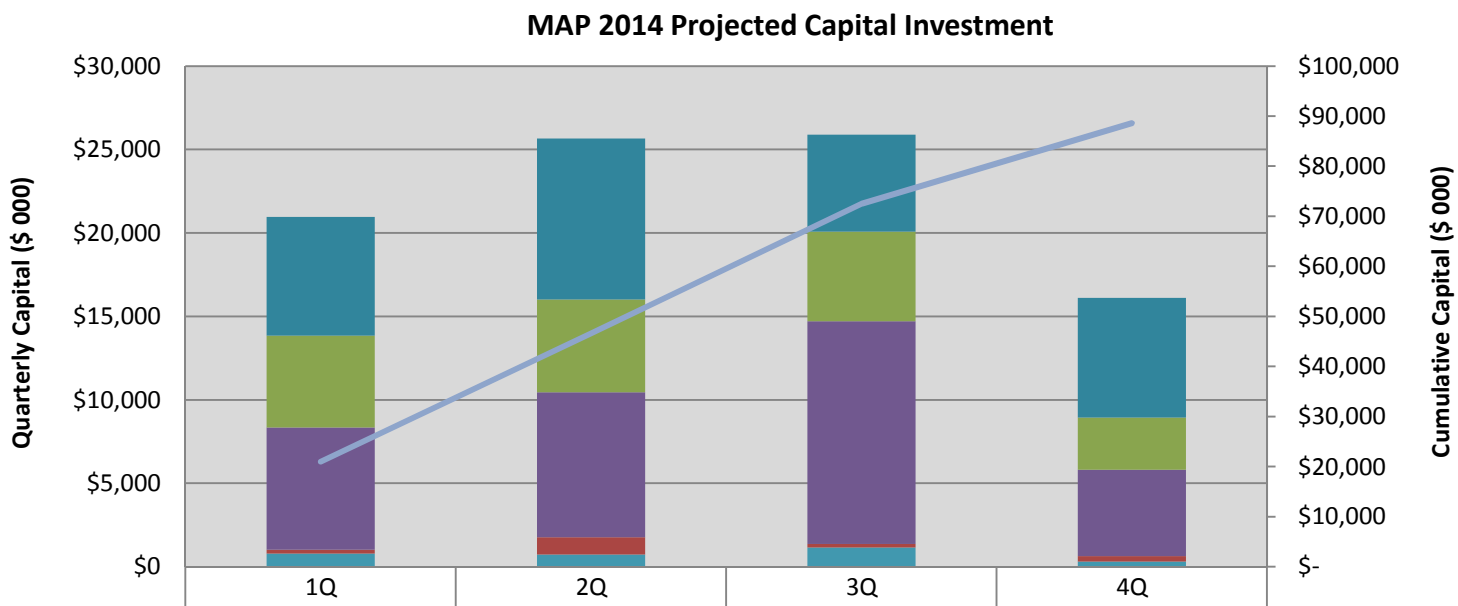


Appendix A: Summary-Level Plan Information

As required by Section 16-108 (b), the total projected $88.6 million of cumulative capital investment under the 2014 Plan will be incremental to AIC's total annual capital investment program, as defined in Section 16-108.5(b). That is, over the course of 2014, AIC will invest at least a projected cumulative total of $88.6 million more capital than a capital investment program that invested at an annual rate defined by AIC's average capital spend for calendar years 2008, 2009, and 2010, as reported in AIC's applicable Federal Energy Regulatory Commission ("FERC") Form 1s.

Figure 1 represents the projected total capital investment associated with the 2014 Plan.

Figure 1: 2014 Plan Capital Investments



	1Q	2Q	3Q	4Q
Infrastructure Improvements	$7,110	$9,638	$5,815	$7,161
Distribution Automation	$5,511	$5,572	$5,367	$3,135
AMI	$7,317	$8,687	$13,351	$5,177
Volt/Var	$242	$1,040	$212	$322
Software and Technology	$781	$722	$1,153	$309
Training Center	$-	$-	$-	$-
Quarterly Total	$20,961	$25,659	$25,897	$16,104
Cumulative Capital	$20,961	$46,619	$72,516	$88,620

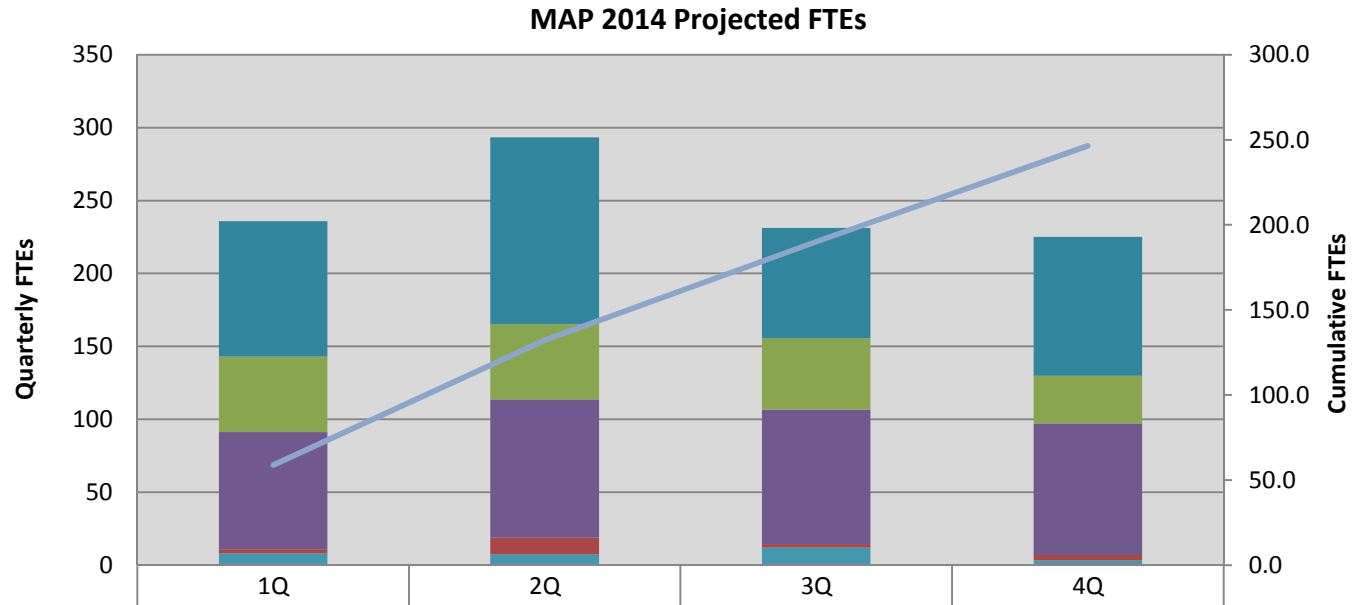
Figure 2 represents the projected total number of units to be installed within the 2014 Plan.

Figure 2: 2014 Plan Units

Infrastructure Improvements	Units	Projected
Replace Primary Distribution Substation Reclosers	Reclosers	38
Substation Animal Protection	Substations	10
Bulk Substation Improvements	Projects	0
Distribution Transformer Reserve	Projects	2
Tie Line Capacity - Line 6973	Project	0
Substation Low side Auto Transfer	Projects	0
High Voltage Distribution Pole Reinforcement	Poles	240
Replace High Voltage Distribution Breakers	Breakers	0
Spacer Cable Program	Miles	9.3
Rebuild Primary Distribution Lines	Miles	17.7
Primary Distribution Lines Capacity Additions	Projects	4
Bulk Transformer Outage Mitigation	Projects	1
Rebuild High Voltage Distribution Lines	Miles	12.2
Expand Bulk Supply Substations	Projects	0
Underground Primary Distribution Cable	Miles	34.4
System Tie Primary Distribution	Projects	8
CERT Remediation	Projects	0
Distribution Automation		
Primary Distribution Automation	Projects	49
Communication Infrastructure	None	0
High Voltage Distribution Relaying	Terminals	24
Distribution Substation Metering	Projects	0
High Voltage Distribution Automation	Projects	13
Underground Network Modernization	Protector	27
Test Bed	Project	0
Advanced Metering Infrastructure		
AMI Summary	Meters (thousands)	40
Volt/Var Optimization		
High Voltage Distribution Volt / Var Control	Projects	18
Primary Distribution Volt/Var Control	Projects	2
Software and Technology Enhancements		
ADMS	Phases	1
Replacement of DEW	Project	0
Training Facilities		
Training Facilities	Locations	0

Figure 3 represents the total projected FTEs to execute the scheduled scope of work associated with the 2014 Plan. The projected FTEs shown in Figure 3 do not include any induced or indirect FTEs.

Figure 3: 2014 Plan FTEs



	1Q	2Q	3Q	4Q
Infrastructure Improvements	92.7	128.0	75.6	95.3
Distribution Automation	51.9	51.6	48.9	32.5
AMI	80.2	94.7	92.1	90.3
Volt/Var	2.9	11.3	2.5	3.8
Software and Technology	8.2	7.6	12.1	3.3
Training Center	0.0	0.0	0.0	0.0
Quarterly Total	235.9	293.3	231.2	225.1
Cumulative Annual Total	59.0	132.3	190.1	246.4

Figure 4: Projected Plan projects to be placed in service in 2014

Program	Location	Description
ADMS	Illinois	Cycle C ADMS
AMI	Illinois	AMI
Bulk Transformer Outage Mitigation	Pinckneyville	Reconductor 2.5 miles of Line 6639 from Pinckneyville Sub to Str. 192A
Communication Infrastructure	Illinois	Bulk Sub High-Bandwidth
Communication Infrastructure	Illinois	High Voltage 2014
Communication Infrastructure	Illinois	Master Remote Upgrades
Communication Infrastructure	Illinois	Master Tower 2014
Distribution Substation Transformer Reserve	Sparta	Sparta Market St Sub (Line Work)
Distribution Substation Transformer Reserve	Sparta	Sparta Market St Sub (Substation Work)
High Voltage Distribution Automation	Bloomington	Add Auto Transfer scheme to substation switches in network Line 3484 at Bloomington GE Rd
High Voltage Distribution Automation	Carrier Mills	Carrier Mills - Install motor operators and SCADA control on switches 305 and 311
High Voltage Distribution Automation	Carrier Mills	South Carrier Mills Sub - Replace Switch 312&313-SCADA
High Voltage Distribution Automation	Champaign	Add Motor Operator/SCADA Control of N.O. switch 1944 on Line 6695
High Voltage Distribution Automation	Charleston	Add AS and SCADA control on Line 730 at switch 617 near Charleston substation
High Voltage Distribution Automation	Chesterville Gibson City Pana, Paris	Add Motor Operator/SCADA Control of N.O. switch 613 on radial sub-transmission lines [N. Mowequa/Chesterville], N.O. switch 666 on radial sub-transmission lines [S. Gilman/S. Gibson City], N.O. switch 385 on radial sub-transmission lines [Pana N./Taylorville S.], & N.O. switch 613 or 632 on radial sub-transmission lines [Paris S./Hutsonville]
High Voltage Distribution Automation	Decatur	Install SCADA controlled motor operator on switch 1819 in Line 3371 near Decatur Zexel
High Voltage Distribution Automation	Jacksonville	Add Motor Operator/SCADA Control of N.O. switch 2115 on radial sub-transmission lines [W. Roodhouse/Jack. Ind Park]
High Voltage Distribution Automation	Le Roy	Install SCADA controlled motor operator on switch 1754 on Line 3397
High Voltage Distribution Automation	Mansfield	Install SCADA Control with Auto-Sectionalizing to switch 1912 in the Line 6603A tap to Mansfield
High Voltage Distribution Automation	Marissa	Add Auto-sectionalizing to Line 3448 around Marissa Substation
High Voltage Distribution Automation	Metropolis	Add SCADA control and Auto-Sect of Substation SWS 694/695 at Metropolis North Substation (Metropolis Loop Phase 1)
High Voltage Distribution Automation	Red Bud	Replace AB 2662 w Viper AS. Keeps Ruma, S Red Bud and Prairie Du Rocher on.
High Voltage Distribution Pole Reinforcement	Canton	Liverpool 34.5kV radial tap ts-201 3-1/0ACSR 69 KV & 3-336.4ACSR 12 KV Cond- 6.4 miles (U32-258) (3)
High Voltage Distribution Pole Reinforcement	Greenfield	Storm hardening for Berdan Junction to Greenfield V79-727
High Voltage Distribution Pole Reinforcement	Jerseyville	Eldred to Hardin w/ TS251 construction class 3 poles with 6m Shield, 336 ACSR 69kV, 336 ACSR underbuilt
High Voltage Distribution Pole Reinforcement	Joppa	69KV White Hill – Joppa Line Hardening
High Voltage Distribution Pole Reinforcement	Macomb	Bushnell 7 mile radial tap (U78-728) TS-251, class 3 poles
High Voltage Distribution Pole Reinforcement	Mt Sterling	TS251 Const Class 3 poles just west of Mt Sterling Sub
High Voltage Distribution Pole Reinforcement	Quincy	Storm hardening for E Quincy Jct- Coatsburg Jct V26-292
High Voltage Distribution Relaying	Centralia	South Centralia - Line 6673
High Voltage Distribution Relaying	Danville	Danville E Fairchild - Line 6661
High Voltage Distribution Relaying	Donnellson	Midway - Line 6644
High Voltage Distribution Relaying	Du Quoin	Duquoin - Line 6639/6668
High Voltage Distribution Relaying	East Peoria	Wallace - Line 6976
High Voltage Distribution Relaying	Fisher	Fisher - Line 6919
High Voltage Distribution Relaying	Greenville	Greenville McCord - Line 3466
High Voltage Distribution Relaying	Herrin	Herrin E - Line 273
High Voltage Distribution Relaying	Kewanee	E. Kewanee - Line 3353/3354
High Voltage Distribution Relaying	Lawrenceville	Lawrenceville S - Line 758
High Voltage Distribution Relaying	Marshall	Marshall - Line 6963
High Voltage Distribution Relaying	Peoria	Cornell - Line 6963

Program	Location	Description
High Voltage Distribution Relaying	Peoria	Glendale - Line 6919
High Voltage Distribution Relaying	Pinckneyville	Pinckneyville - Line 6636/6638/6639
High Voltage Distribution Relaying	Roanoke	Hawthorne - Line 6962
High Voltage Distribution Relaying	Steeleville	Steeleville - Line 3350
High Voltage Distribution Relaying	Washington	Eastern - Line 6962/6976
High Voltage Distribution Relaying	West Salem	West Salem - Line 6640
High Voltage Distribution Relaying	Wood River	Wood River 6th St - Line 3473
High Voltage Volt/Var Control	Argenta	Add SCADA to 69kv Substation Capacitor Bank at Argenta
High Voltage Volt/Var Control	Arlington	Add SCADA Control to 34.5kv 3.6MVAR Capacitor Bank at Cherry Substation
High Voltage Volt/Var Control	Belleville	Add SCADA Control to Capacitor Bank at Belleville Pontiac Substation
High Voltage Volt/Var Control	Columbia	Add SCADA Control to Capacitor Bank at Columbia Substation
High Voltage Volt/Var Control	Danville	Add SCADA Control to Capacitor Bank at Bowman Station
High Voltage Volt/Var Control	Danville	Add SCADA Control to Capacitor Bank at Liberty Lane Substation
High Voltage Volt/Var Control	Marshall	Add SCADA Control to Capacitor Bank at Marshall Substation
High Voltage Volt/Var Control	Martinsville	Add SCADA Control to Capacitor Bank at Martinsville Substation
High Voltage Volt/Var Control	Mt. Vernon	Add SCADA to 34.kv Capacitor bank at Mt Vernon 27th St substation
High Voltage Volt/Var Control	Ottawa	Add SCADA Control to 34.5kv 5.4MVAR Capacitor Bank at Ottawa Cactus Substation
High Voltage Volt/Var Control	Ottawa	Add SCADA Control to 34.5KV 7.2MVAR Capacitor Bank at North Ottawa Substation
High Voltage Volt/Var Control	Ramsey	Add SCADA Control to 34.5kv 3.6Mvar Capacitor Bank at Ramsey Substation
High Voltage Volt/Var Control	Smithton	Add SCADA Control to Capacitor Bank at Smithton Station
High Voltage Volt/Var Control	Spring Valley	Add SCADA Control to 34.5kv 5.4MVAR Capacitor Bank at Spring Valley Substation
High Voltage Volt/Var Control	Troy	Add SCADA to 34.5kv Substation Capacitor Banks- Troy Industrial substation
High Voltage Volt/Var Control	Troy Grove	Add SCADA Control to 34.5kv 3.6MVAR Capacitor Bank at Troy Grove Substation
High Voltage Volt/Var Control	Valmeyer	Add SCADA Control to Capacitor Bank at Valmeyer Rt 156 Substation
High Voltage Volt/Var Control	Waterloo	Add SCADA Control to Capacitor Bank at Waterloo Substation
Primary Distribution Automation	Belleville	Install DA auto trsfr scheme using nine Intellirupters, on new feeders at Belleville West Haven (Existing Sub K05-New West Haven HD5) and ties to Belle Valley, Richland Creek, and Belleville 8th St.
Primary Distribution Automation	Belleville	Replace Belleville 44th breaker 140-0 with recloser, SCADA, and Intellinode and incorporate into existing DA scheme. Upgrade Belleville 44th feeder 138-0 to include DA transfer capability to new Concordia feeder.
Primary Distribution Automation	Belleville	Upgrade Richland Creek feeder 251-0 to include DA transfer capability to new West Haven feeder
Primary Distribution Automation	Bloomington	Install DA auto trsfr scheme, midpoint of Bloomington Empire circuit 176, midpoint of Normal Rt66 circuit 282, and at the tie.
Primary Distribution Automation	Bloomington	Install DA auto trsfr scheme, midpoint of Bloomington GE Rd circuit 185, midpoint of Normal Rt 66 circuit 282, and at the tie
Primary Distribution Automation	Bloomington	Install DA auto trsfr scheme, midpoint of Bloomington Morris Ave. circuit 381, midpoint of S. Bloomington circuit 153, and at the tie.
Primary Distribution Automation	Bloomington	Install DA auto trsfr scheme, midpoint of West Bloomington circuit 163, midpoint of Bloomington Washington St circuit 402, and at the tie.
Primary Distribution Automation	Bloomington	Replace Bloomington Morris Ave. feeder 381 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Bloomington	Replace S. Bloomington feeder 153 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Carbondale	Install DA auto trsfr scheme, midpoint of Makanda circuit 581, midpoint of Carbondale Pleasant St. circuit 511, and at the tie
Primary Distribution Automation	Centralia	Install DA auto trsfr scheme, midpoint of Centralia S. Pleasant circuit 150, midpoint of Centralia Mitchell Rd circuit 166, and at the tie
Primary Distribution Automation	Champaign	Install DA auto trsfr scheme, midpoint of Champaign Bradley circuit 117, midpoint of Champaign Kirby circuit 811, and at the tie.
Primary Distribution Automation	Champaign	Install DA auto trsfr scheme, midpoint of Champaign Bradley circuit 117, midpoint of Champaign Kirby circuit 821, and at the tie.
Primary Distribution Automation	Champaign	Install DA auto trsfr scheme, midpoint of Champaign Mattis circuit 166, midpoint of Champaign Bradley circuit 116, and at the tie, upgrade voltage regulators.
Primary Distribution Automation	Champaign	Install DA auto trsfr scheme, midpoint of Champaign Oak St. circuit 541, midpoint of Champaign Kirby circuit 812, and at the tie.

Program	Location	Description
Primary Distribution Automation	Champaign	Install DA auto trsfr scheme, midpoint of Champaign Windsor circuit 388, midpoint of SW Campus circuit 352, and at the tie, regulator upgrade required.
Primary Distribution Automation	Champaign	Install DA auto trsfr scheme, midpoint of N. Champaign circuit 131, midpoint of Champaign Mattis circuit 166 and two of the tie switches
Primary Distribution Automation	Champaign	Install DA auto trsfr scheme, midpoint of Urbana Goodwin circuit 415, midpoint of Champaign Oak St circuit 543, and at the tie.
Primary Distribution Automation	Champaign	Replace Champaign Bradley feeder 117 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Champaign	Replace Champaign Kirby Ave feeder 812 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Champaign	Replace Champaign Kirby Ave feeder 821 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Champaign	Replace Champaign Oak St. feeder 541 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Collinsville	Install DA auto trsfr scheme, midpoint of Collinsville Cloverleaf circuit 389, midpoint of Collinsville Reese Dr circuit401, and at the tie.
Primary Distribution Automation	Collinsville	Replace Collinsville Cloverleaf feeder 388 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Collinsville	Replace Collinsville Reese Dr. Substation breaker 401 with Recloser that includes Metering, Intellinode, and SCADA.
Primary Distribution Automation	Danville	Install DA auto trsfr scheme, midpoint of Danville E. Fairchild circuit 127 , midpoint of Danville Winter Ave circuit 175, and at the tie
Primary Distribution Automation	Decatur	Add DA to Decatur Brush College ckt 117 to East Decatur ckt 110
Primary Distribution Automation	Decatur	Install DA auto trsfr scheme, midpoint of Decatur Baltimore circuit 142, midpoint of East Decatur circuit 110, at the tie point
Primary Distribution Automation	East Peoria	Replace Fondulac feeder 4 recloser and interface to DA auto trsfr scheme
Primary Distribution Automation	Edwardsville	Install DA auto trsfr scheme, midpoint of S. Edwardsville 407, midpoint of Edwardsville Schwarz St 365, and at the tie.
Primary Distribution Automation	Edwardsville	Replace Edwardsville 2nd breakers 362 and 361 with recloser that includes metering, Intellinode, and SCADA.
Primary Distribution Automation	Edwardsville	Replace S. Edwardsville breakers 412, 413, and 415 with recloser that includes metering, Intellinode, and SCADA.
Primary Distribution Automation	Jacksonville	Install DA auto trsfr scheme, midpoint of S. Jacksonville circuit 212, midpoint of Jacksonville PP circuit 332, and at the tie.
Primary Distribution Automation	Macomb	Replace W. Macomb feeder 528 recloser, scada, and interface to DA auto trsfr scheme. Install Intellinode on feeder 520.
Primary Distribution Automation	Metamora	Install DA auto trsfr scheme, midpoint of Metamora-FDR 3, midpoint of Fondulac-FDR4, and at the tie.
Primary Distribution Automation	Metamora	Replace Metamora feeder 3 distribution breaker with recloser and interface to DA auto trsfr scheme
Primary Distribution Automation	Mt. Vernon	Install DA auto trsf scheme, midpoint of Mt Vernon 27th circuit 155, midpoint of Mt Vernon Brownsville Rd circuit 161, and at the tie
Primary Distribution Automation	O' Fallon	Install DA auto trsfr scheme, midpoint of O'fallon Troy Rd circuit 311 , midpoint of O'fallon Seven Hills circuit 258, and at the tie
Primary Distribution Automation	Peoria	Install DA auto trsfr scheme, midpoint of Radnor feeder 8, midpoint of Northwest feeder 1, and at a tie
Primary Distribution Automation	Peoria	Install DA auto trsfr scheme, midpoint of Sheridan feeder 2, midpoint of Park feeder 1, and at a tie
Primary Distribution Automation	Peoria	Install Intellinode on Park feeder 1 for DA auto trsfr scheme
Primary Distribution Automation	Peoria	Replace Sheridan feeder 2 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Rushville	Replace Rushville feeder 561 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Urbana	Install DA auto trsfr scheme, midpoint of Urbana Five Pts circuit 951, midpoint of Urbana Washington circuit 470, and at the tie.
Primary Distribution Automation	Urbana	Install DA auto trsfr scheme, midpoint of Urbana Philo Rd. ciruit 241, midpoint of Urbana Washington St circuit 470, and at the tie.
Primary Distribution Automation	Urbana	Replace Urbana Philo Road feeder 241 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Urbana	Replace Urbana Washington St. feeder 470 recloser, scada, and interface to DA auto trsfr scheme
Primary Distribution Automation	Wood River	Install DA auto trsfr scheme, midpoint of Wood River 6th St circuit 339, midpoint of Wanda circuit 350, and at the tie.
Primary Distribution Automation	Wood River	Install DA auto trsfr scheme, midpoint of Wood River 6th St circuit 340, midpoint of Rosewood Heights circuit 353, and at the tie
Primary Distribution Lines Capacity Additions	Belleville	Extend 6th Ckt out of Porter Rd Sub
Primary Distribution Lines Capacity Additions	Centralia	Upgrade circuit to Maschhoffs 1 mile
Primary Distribution Lines Capacity Additions	East Peoria	Reconductor Springbay Feeder 2 to the South for a Feeder Tie to Fondulac Feeder 4
Primary Distribution Lines Capacity Additions	Eldorado	Eldorado - Upgrade 4000' of 1/0 ascr with 556 MCM from Rt 142 to 4th St along Rt 45 in Eldorado
Primary Distribution Volt/Var Control	Alton	Replace existing radio controlled distribution capacitor controls in Alton with SCADA controls

Program	Location	Description
Primary Distribution Volt/Var Control	East St. Louis	Replace existing radio controlled distribution capacitor controls in E. St Louis with SCADA controls
Rebuild High Voltage Distribution Lines	East St Louis	E. St. Louis - Ridge-72 - Tie ESL Fairview Heights system to IP L3311.
Rebuild High Voltage Distribution Lines	Gilman	Gilman - Z05725 - Sheldon REA-Sheldon
Rebuild High Voltage Distribution Lines	Hillsboro	L3453 - Relocate portion of L 3453 from old abandon railroad property to roadside.
Rebuild High Voltage Distribution Lines	Hillsboro	Respan portions of L3317 due to galloping.
Rebuild High Voltage Distribution Lines	Hillsboro	X04-720 - Create tie 3314 and 3348.
Rebuild High Voltage Distribution Lines	Robinson	Robinson - X96-711 - Lawrenceville S to Robinson.
Rebuild Primary Distribution Lines	Belleville	Upgrade 7400' of old single phase #6CW to 3 phase 556AA
Rebuild Primary Distribution Lines	Carbondale	Makanda S60-581 - Upgrade 2800' 1-ph to V phase along Racoon Valley Rd
Rebuild Primary Distribution Lines	Champaign	Rebuild 1.4 miles of St. Joseph Rural R20-502 feeder from Switch 502-83 to Switch 502-91. Upgrade the #2 copperweld to 556 AAC.
Rebuild Primary Distribution Lines	Hillsboro	Morrisonville P54-827 rebuild/relocation. 62 poles.
Rebuild Primary Distribution Lines	Jacksonville	Rebuild remaining 2.3miles portions of feeder tie to New Berlin
Rebuild Primary Distribution Lines	Jacksonville	Reconductor 8096' of Jacksonville West
Rebuild Primary Distribution Lines	Paxton	Rossville S Y68-581-Rebuild Rural Portions
Rebuild Primary Distribution Lines	Ramsey	Rebuild and relocate 1.2 miles of ckt Q71-846.
Rebuild Primary Distribution Lines	Sparta	4-12 KV conversion. Bad conductor on winter peaking system. 2 miles (e)
Rebuild Primary Distribution Lines	Sparta	Reconductor 7100' of #4 cu, 1/0ck w 1/0 acsr.Sw 929-70 on Park along line along north, Winters & Cole.
Replace Primary Distribution Substation Reclosers	Brimfield	Brimfield Substation - Replace 3phase recloser on feeder 1
Replace Primary Distribution Substation Reclosers	Canton	Canton Spoon River Substation - Replace 3phase recloser on feeder 509
Replace Primary Distribution Substation Reclosers	Carbondale	Carbondale SW Substation -Replace 3phase recloser on feeder 507
Replace Primary Distribution Substation Reclosers	Carterville	Carterville Substation-Replace 3phase recloser 595
Replace Primary Distribution Substation Reclosers	Eureka	Eureka Substation - Replace 3phase recloser on feeder 1 & 2
Replace Primary Distribution Substation Reclosers	Fairmount	Fairmount Substation - Replace 3phase recloser on feeder 1 & 4
Replace Primary Distribution Substation Reclosers	Farmington	Linberg Substation - Replace 3phase recloser on feeder 1
Replace Primary Distribution Substation Reclosers	Gibson City	Gibson City Substation - Replace 3phase recloser on feeder 512
Replace Primary Distribution Substation Reclosers	Harrisburg	Harrisburg S Substation - Replace 3phase recloser 512
Replace Primary Distribution Substation Reclosers	Herrin	Herrin SW Substation-Replace 3phase recloser 549
Replace Primary Distribution Substation Reclosers	Jerseyville	Jerseyville Substation-Replace 3phase recloser 511
Replace Primary Distribution Substation Reclosers	Kansas	Kansas Substation - Replace 3phase recloser on feeder 507
Replace Primary Distribution Substation Reclosers	Lacon	Fulton Substation - Replace 3phase recloser on feeder 3
Replace Primary Distribution Substation Reclosers	Lincoln	Kickapoo Substation - Replace 3phase recloser on feeder 2
Replace Primary Distribution Substation Reclosers	Lincoln	McGrath Substation - Replace 3phase recloser on feeder 4

Program	Location	Description
Replace Primary Distribution Substation Reclosers	Marion	Energy South Substation Replace 3phase recloser 528
Replace Primary Distribution Substation Reclosers	Mattoon	Mattoon Northwest -Replace 3phase recloser 555 & 556
Replace Primary Distribution Substation Reclosers	Metamora	Springbay Substation - Replace 3phase recloser on feeder 1
Replace Primary Distribution Substation Reclosers	Moweaqua	Moweaqua N. Substation - Replace 3phase recloser on feeder 521
Replace Primary Distribution Substation Reclosers	Murphysboro	Murphysboro NW Substation-Replace 3phase recloser 503
Replace Primary Distribution Substation Reclosers	Peoria	Allen Substation-Replace 3phase recloser on feeder 1 & 3
Replace Primary Distribution Substation Reclosers	Peoria	Lake Substation-Replace 3phase recloser on feeder 2
Replace Primary Distribution Substation Reclosers	Peoria	Nebraska Substation - Replace 3phase recloser on feeder 3
Replace Primary Distribution Substation Reclosers	Peoria	Ozark Substation-Replace 3phase recloser on feeder 3
Replace Primary Distribution Substation Reclosers	Pittsfield	Pittsfield Substation-Replace 3phase recloser on feeder 530
Replace Primary Distribution Substation Reclosers	Quincy	Quincy 36th & College Substation - Replace 3phase recloser on feeder 526
Replace Primary Distribution Substation Reclosers	Savoy	Savoy Substation - Replace 3phase recloser on feeder 505
Replace Primary Distribution Substation Reclosers	Springfield	Ridge Substation - Replace 3phase recloser on feeder 1 & 2
Replace Primary Distribution Substation Reclosers	Taylorville	Taylorville Shumway Substation - Replace 3phase recloser on feeder 500
Replace Primary Distribution Substation Reclosers	Washington	Kice Substation - Replace 3phase recloser on feeder 1
Replace Primary Distribution Substation Reclosers	Watseka	Watseka East Substation-Replace 3phase recloser 537
Replace Primary Distribution Substation Reclosers	Wyoming	Stark Substation - Replace 3phase recloser on feeder 1
Replace Primary Distribution Substation Reclosers	Yates City	Salem Substation (CIL)-Replace 3phase recloser on feeder 1
Spacer Cable Program	Bethalto	Repair 1.53 miles of 477 MCM spacer cable, circuit J34-377, Bethalto
Spacer Cable Program	Carlinville	Repair 1.50 miles of 477 MCM spacer cable, circuit K09-863, Carlinville
Spacer Cable Program	Champaign	Replace 2,428' of spacer cable along ckt 117. Duncan Rd/Rt 10 to I-57.
Spacer Cable Program	Champaign	Replace 5,362' of spacer cable along ckt 552. Perkins Sub west to Rt 45 and north along 45.
Spacer Cable Program	Danville	Replace 3,116' of space cable along ckt 135. Westville W Main Sub to Washington Ave.
Spacer Cable Program	Decatur	Replace 1550' of spacer cable on circuit L36-215
Spacer Cable Program	Decatur	Replace 2000' of spacer cable west of Walnut Grove substation on ckt L35-137
Spacer Cable Program	Gillespie	Repair 0.50 miles of 477 MCM spacer cable, circuit M47-802, Gillespie
Spacer Cable Program	Gillespie	Repair 0.50 miles of 477 MCM spacer cable, circuit M48-814, Gillespie
Spacer Cable Program	Granite City	Repair 0.95 miles of 477 MCM spacer cable, circuit M81-402, Granite City
Spacer Cable Program	Granite City	Repair 0.95 miles of 477 MCM spacer cable, circuit M81-405, Granite City
Spacer Cable Program	Salem	Rebuild 0.5 miles of spacer cable on ckt Q83-171. Route 50 north to OCRs.
Spacer Cable Program	Sparta	Rebuild 1000' of spacer cable on College St on ckt R10-925.

Program	Location	Description
Substation Animal Protection	Barry	Barry - Install new electric fence
Substation Animal Protection	Bloomington	Bloomington Power House - Install new electric fence
Substation Animal Protection	Bloomington	Bloomington Prospect - Install new electric fence
Substation Animal Protection	Cuba	Cuba - Install new electric fence
Substation Animal Protection	Marblehead	North Marblehead - Install new electric fence
Substation Animal Protection	Mt Zion	Mt. Zion Rt. 121 - Install new electric fence
Substation Animal Protection	Normal	Normal Main St. - Install new electric fence
Substation Animal Protection	Ottawa	Ottawa - Install new electric fence
Substation Animal Protection	Ottawa	South Ottawa - Install new electric fence
Substation Animal Protection	Palmyra	Palmyra - Install new electric fence
System Tie Primary Distribution	Belleville	Columbia Palmer Creek Ckt 213 - Reconductor 4000' of 3ph 1/0 with 556.
System Tie Primary Distribution	Champaign	Champaign Walnut St Sub 12 kV Ckts reserve - Phase 1 and 2
System Tie Primary Distribution	Danville	Div 4 - Build a Fairmount D66-1-Fithian Rural M25-144 12kV Circuit Tie
System Tie Primary Distribution	Decatur	Decatur - Upgrade approximately 12 spans of 12kV line to provide a circuit tie to circuit L08-226
System Tie Primary Distribution	East Peoria	Elm Grove 1 tie to Sheridan 2
System Tie Primary Distribution	Macomb	Reconductor 1145' of 1/0ACSR with 556AAC from pole #LI1634 to pole #LI1865 and install 2700' of 4/0AL URD between pole #LI1865 and pole #LI2135
System Tie Primary Distribution	Peoria	Ozark 1 feeder tie to Bartonville 25
System Tie Primary Distribution	Peoria	Peoria - Alta 1 feeder tie to Allen 3
Underground Network Modernization	Illinois	Replace Network Protectors and add SCADA in Peoria, Bloomington, and Decatur Area (27)
Underground Primary Distribution Cable	Belleville	Replace backup sub exit to Ckt 117. Mapped as 117a or 117b.
Underground Primary Distribution Cable	Belleville	Trailer Crt on E Main. Riser 126-73. 1500'
Underground Primary Distribution Cable	Bloomington	Bloomington -South of Ft Jesse Rd, West of Towanda Replace BCN primary
Underground Primary Distribution Cable	Bloomington	Replace BCN primary, Hilltop Mobil Home Park
Underground Primary Distribution Cable	Brimfield	Vault 86191 - Vault 84200 - Transformer 437091
Underground Primary Distribution Cable	Carbondale	Carbondale - Replace 35 yr old 1/0 UG in large apartment complex and replace inoperable switch pedestal
Underground Primary Distribution Cable	Carbondale	Carbondale - Replace 700' of 3 phase 1/0 cable
Underground Primary Distribution Cable	Chillicothe	Replace underground cable 20804 N Deer Bluffs Dr D36-2
Underground Primary Distribution Cable	Decatur	Replace BCN primary, Butler Dr
Underground Primary Distribution Cable	East Peoria	Riser Fuse 119482 - Transformer 107615
Underground Primary Distribution Cable	East St. Louis	Replace 70' of 750AL with 750CU
Underground Primary Distribution Cable	Eldorado	Replace bad UG 3ph pri 170 ft to sta 81559 and complete loop- only 2 outages both within last 8 months
Underground Primary Distribution Cable	Green Valley	Riser Fuse 207989 - Transformer 204674
Underground Primary Distribution Cable	Pekin	Riser Fuse 208140 - Transformer 204443
Underground Primary Distribution Cable	Peoria	2014 UG Injection
Underground Primary Distribution Cable	Springfield	Replace cable-Morningside Trailer Pk
Underground Primary Distribution Cable	Toulon	Riser Fuse 556082 - Transformer 505350
Underground Primary Distribution Cable	Troy	Replace 2900' of bad UG along Arrowhead Dr.