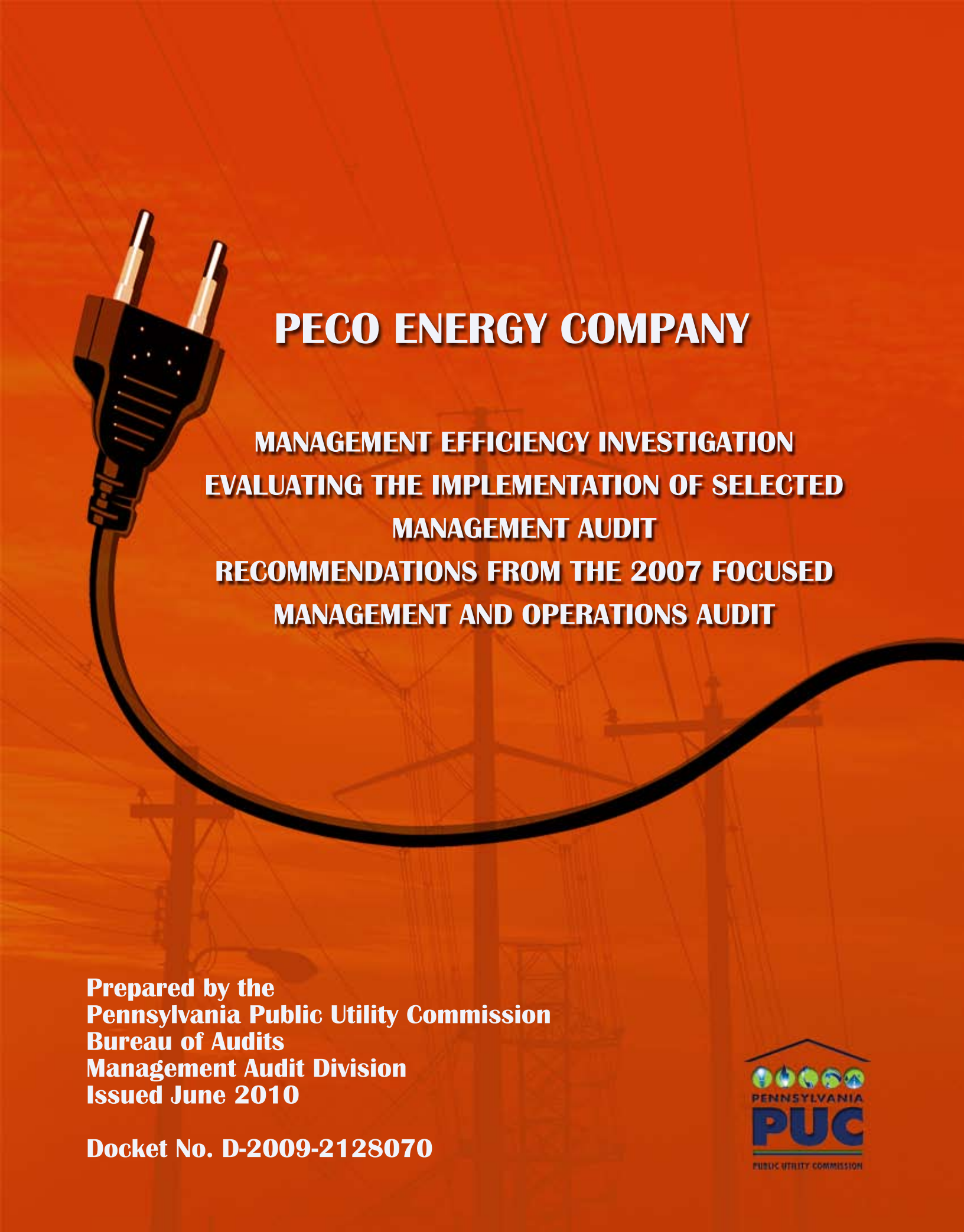

PECO ENERGY COMPANY

MANAGEMENT EFFICIENCY INVESTIGATION EVALUATING THE IMPLEMENTATION OF SELECTED MANAGEMENT AUDIT RECOMMENDATIONS FROM THE 2007 FOCUSED MANAGEMENT AND OPERATIONS AUDIT

Prepared by the
Pennsylvania Public Utility Commission
Bureau of Audits
Management Audit Division
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Docket No. D-2009-2128070

PENNSYLVANIA PUC
PUBLIC UTILITY COMMISSION

PECO ENERGY COMPANY
MANAGEMENT EFFICIENCY INVESTIGATION

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I. INTRODUCTION

A. Background

On April 20, 2006, the Pennsylvania Public Utility Commission's (PUC or Commission) accepted the Schumaker & Company (Schumaker or Consultant) proposal to perform a stratified management and operations audit of the PECO Energy Company (PECO). Schumaker subsequently completed its work, and in August 2007, issued a final report containing 53 recommendations for improvement. PECO submitted its Implementation Plan on August 10, 2007 indicating acceptance or partial acceptance of 52 recommendations and rejection of one recommendation. On August 30, 2007, at D-05MGT048, the Commission made both the audit report and Implementation Plan public and directed PECO to:

- Proceed with its August 10, 2007 Implementation Plan.
- Submit progress reports on the implementation annually, by August 30, for the next three years.

Since the audit report was made public, PECO has submitted two Implementation Plan updates as requested by the Commission to ascertain the Company's progress in implementing the recommendations from the management audit report. Based on a review of these updates, the Audit Staff elected to conduct a Management Efficiency Investigation (MEI) of PECO's progress in implementing 27 of the original 53 recommendations. Specific items of management effectiveness and operational efficiency may be investigated pursuant to Title 66 Pa. C.S. § 516(b).

B. Objective and Scope

The objective of this MEI was to review and evaluate the effectiveness of PECO's efforts to implement certain recommendations contained in the August 2007 Focused Management and Operations Audit Report. The scope of this evaluation was limited to PECO's efforts in implementing 27 prior management audit recommendations in the functional areas of:

- Executive Management
- Corporate Governance
- Affiliate Interests
- Financial Management
- Electric and Gas Operations
- Electric and Gas Reliability
- Emergency Response
- GIS Mapping
- Emergency Preparedness
- Customer Service
- Support Services

Additionally, the Audit Staff deemed it prudent to review PECO's compliance with PUC regulations at 52 Pa. Code Chapter 101 regarding physical security, cyber security, emergency response, and business continuity plans.

C. Approach

This MEI was performed by the Management Audit Staff of the PUC's Bureau of Audits (Audit Staff). Actual fieldwork began on October 13, 2009, and continued through December 16, 2009. The fact gathering process included:

- Interviews with PECO personnel.
- Analysis of selected PECO records, documents, reports, and other information for the period 2005 through 2009.
- Visits to selected Company facilities.

II. SUMMARY OF MANAGEMENT EFFECTIVENESS AND OPERATING EFFICIENCY

The Audit Staff found that PECO has effectively or substantially implemented 14 of the 27 prior management audit recommendations reviewed and has taken some action on the remaining 13 recommendations. Among the more notable improvements achieved by the management of PECO are:

- Completed implementation of the Mobile Dispatch System resulting in annual savings of approximately $6,500,000.
- Successfully reduced its energy-theft caseload by reorganizing its Revenue Protection Department and utilizing several reports to monitor for electric-theft resulting in annual savings of approximately $1,200,000 since 2006.
- Taken steps to improve the effectiveness of its gas-theft of service program resulting in annual savings of approximately $35,000.
- Updated its staffing planning model with more detailed tools including a staffing gap analysis; identifying critical positions; estimating attrition and retirement; anticipating hiring needs; and recruiting, retaining, and developing staff.
- Reduced the need for corrective maintenance to approximately 8% of total pruning costs over the 2005 to 2009 timeframe resulting in annual savings of $112,000.
- Increased its overall vegetation management funding over 2005 levels and plans to maintain higher funding levels through 2012.
- Amended the Audit Committee Charter to require periodic formal reviews on bidding for external audit services.
- Updated internal documentation relating to Exelon affiliate relationships and transactions to reflect the impact of the Public Utility Holding Company Act of 2005.
- Developed a process to compare cost of services provided to affiliates that exceed $500,000 per year to market resulting in an annual savings of $273,000.
- Adopted a policy for its Internal Audit Services to perform internal audits of affiliate transactions and associated cost allocations every two years.
- Began using integrated absence management and expanded workforce availability benchmarking metrics.
- Developed and implemented defined Information Technology project management methodologies.
- Enhanced the risk management program through updated policies and procedures.

While these accomplishments are commendable, the Audit Staff has identified further improvement opportunities in certain areas. In particular, PECO needs to:

- Manage annual non-storm overtime spend to more reasonable levels through the use of proper controls, reviews, and authorizations including monitoring and tracking overtime which should result in annual savings ranging from $500,000 to $1,500,000.
- Allocate vegetation funding levels among operation regions to target areas experiencing elevated tree related outages relative to the other operating regions and continue 34kV and Mid-cycle programs to mitigate tree related outages.
- Determine the feasibility of augmenting the tree trimming criteria for the selected circuits under the 34kV and mid-cycle programs to include more ground-to-sky trimming where strategically feasible and appropriate considering the public ramifications.
- Restructure the reporting relationship of the Internal Audit function so that it no longer reports administratively, directly or indirectly to management responsible for the financial accounting or finance operations of the company.
- File updated affiliated interest documents including, but not limited to, the Mutual Services Agreement and General Services Agreement, and associated organization structure documents to the Commission for review and approval.
- Complete market testing in 2010 for select Exelon shared services.
- Increase efforts to fill vacant positions in the Internal Audit Department more quickly in order to mitigate the need to augment audit services and strive to more closely align staff expertise to the Company needs which would result in annual savings of $101,000.
- Complete development and implementation of the Enterprise Geographic Information System (GIS) to visually portray the results of the electric reliability program, as appropriate.
- Strive to reduce the number of “at-fault” line hits attributable to inaccurate and no print causal factors which would result in annual savings of $50,000.
- Complete deployment of the Enterprise GIS system, as appropriate, to further enhance the ability to geographically display the gas pipe network.
- Document lessons learned (i.e., successes and challenges) from the Mobile Dispatch System implementation and perform a final project evaluation to provide feedback on system performance, business process changes and change management issues to facilitate a better understanding of any limitations incurred due to underlying GIS issues.
- Complete the development and implementation of formal quality assurance functions for major projects.

Exhibit II-1 summarizes the 27 prior recommendations reviewed and the Audit Staff’s follow-up findings, conclusions, and recommendations.

PECO ENERGY COMPANY
MANAGEMENT EFFICIENCY INVESTIGATION
SUMMARY OF AUGUST 2007 MANAGEMENT AUDIT RECOMMENDATIONS AND STAFF'S FOLLOW-UP FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS.

August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
III. EXECUTIVE MANAGEMENT				
Continue a move toward integrated absence management and implement broader workforce availability metrics in the Human Resources Performance Indicator Scorecard.	4th Quarter 2008	1.	PECO is now using integrated absence management and expanded workforce availability benchmarking metrics.	None.
IV. CORPORATE GOVERNANCE				
Organize the Internal Audit function to report administratively to an independent organization, the CEO, or directly to the Board of Directors.	1st Quarter 2008	2.	The Internal Audit function reports administratively to the EVP Finance & Legal.	Restructure the reporting relationship of the Internal Audit function so that it no longer reports administratively, directly or indirectly, to management responsible for the financial accounting or finance operations of the company.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
IV. CORPORATE GOVERNANCE (continued)				
Formally review bidding for external audit services every five years to consider alternative firms as Exelon's external auditors.	4th Quarter 2007	3.	The Audit Committee Charter was amended to require periodic (at least every five years) formal reviews on bidding for external audit services.	None.
V. AFFILIATE INTERESTS				
Provide updated affiliated interest and associated organization structure documents to PaPUC staff.	4th Quarter 2008	4.	The GSA and MSA affiliated interest agreements on file with the Commission are forms and have since been updated by PECO, but not filed with the Commission for approval.	File updated affiliated interest documents including, but not limited to, the MSA and GSA, and associated organization structure documents to the Commission for review and approval.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
V. AFFILIATE INTERESTS (continued)				
Update internal documentation now that Public Utility Holding Act of 2005 is in effect.	4th Quarter 2007	5.	Internal documentation relating to Exelon affiliate relationships and transactions has been updated to reflect the impact of PUHCA 2005.	None.
Perform a study examining whether there is a material difference between "at cost" and market pricing for service transactions that exceed $500,000 per year with selected Exelon service affiliates.	1st Quarter 2008	6.	PECO has developed a process to compare cost of services provided to its affiliates that exceed $500,000 per year to market.	None.
Develop a formal PECO program to periodically and systematically evaluate use of shared services within the Exelon organization versus use of outsourcing options.	1st Quarter 2008	7.	PECO has developed a formal approach for evaluating the cost effectiveness of using Exelon shared services.	Complete market testing in 2010 for select Exelon shared services and continue to evaluate on an annual basis.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
V. AFFILIATE INTERESTS (continued)				
Perform a cost benefit analysis regarding consolidation of its billing/allocation and time reporting systems.	3rd Quarter 2008	8.	Exelon performed a cost/benefit analysis and recently implemented a new Intercompany Billing System and Enterprise Time and Labor System.	None.
Regularly perform internal audits of affiliate transactions and associated cost allocations.	4th Quarter 2008	9.	Exelon has adopted a policy for its Internal Audit Services to perform internal audits of affiliate transactions and associated cost allocations every two years.	None.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
VI. FINANCIAL MANAGEMENT				
Investigate and assess the cost-effectiveness of staff augmentation, as currently used, for the Internal Audit function.	1st Quarter 2008	10.	The Company performed an assessment of its utilization of external audit resources to meet the workload requirements of its Internal Audit Department.	Increase efforts to fill vacant positions in the Internal Audit department more quickly in order to mitigate the need to augment audit services and strive to more closely align staff expertise to the Company's needs.
VII. ELECTRIC AND GAS OPERATIONS				
Evaluate the annual overtime charges for reasonableness and determine if it is an efficient use of resources.	4th Quarter 2008	11.	Non-storm overtime as a percentage of total Electric Field Operation's Department payroll remains high.	Manage annual non-storm overtime spend to more reasonable levels through the use of proper controls, reviews, and authorizations including monitoring and tracking of annual overtime hours as a percentage of regular man-hours by locality/service center and Company-wide.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
VII. ELECTRIC AND GAS OPERATIONS (continued)				
Proactively assess hiring needs to address the potential attrition of very experienced field operations employees over the course of the next several years, but enhance the Staff Planning documentation to provide a more comprehensive and detailed analysis of projected attrition and hiring needs.	2nd Quarter 2008	12.	PECO has updated its staff planning model with more detailed tools including a staffing gap analysis; identifying critical positions; estimating attrition and retirement; anticipating hiring needs; and recruiting, retaining, and developing staff.	None.
VIII. ELECTRIC AND GAS RELIABILITY				
Enhance the ability to visually portray the results of PECO's electric reliability program.	3rd Quarter 2008	13.	PECO has taken steps to select a vendor for implementing an Enterprise Geographic Information System (GIS) that will help visually portray the results of PECO's electric reliability program.	Complete a final Business Case encompassing the overall information Technology strategy and upon approval, select a vendor and implement the Enterprise GIS to visually portray the results of PECO's electric reliability program, as appropriate.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
VIII. ELECTRIC AND GAS RELIABILITY (continued)				
Report on steps taken to address the slightly unfavorable trends recently experienced in outage causes.	1st Quarter 2008	14.	PECO has implemented programs to address the unfavorable system trends in both equipment and tree-related outages; however, additional resources have not been allocated to those operating regions and/or counties with elevated tree related outage levels.	Allocate vegetation management funding levels among operating regions and the 34kV, herbicide, Hazardous Removal and mid Cycle programs to target areas experiencing elevated tree related outages relative to the other operating regions to mitigate tree related outages.
Increase vegetation management funding 10% to 20% over 2005 levels to address the increase in the number of tree-related interruptions.	Complete	15.	PECO has increased its overall vegetation management funding over 2005 levels and plans to maintain higher funding levels through 2012.	None.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
VIII. ELECTRIC AND GAS RELIABILITY (continued)				
Reduce the need for corrective maintenance expenditures.	Complete	16.	PECO has reduced the need for corrective maintenance to approximately 8% of total pruning costs over the 2005 to 2009 timeframe.	None.
Shift and prioritize the focus of the proposed mid-cycle and 34kV programs to actions that have the most impact on customer minutes of interruptions.	2nd Quarter 2008	17.	PECO has directed the focus of the mid-cycle and 34kV programs to circuits that have the most impact on customer interruptions; however, additional improvement opportunities have been identified.	Determine the feasibility of augmenting the tree trimming criteria for the selected circuits under the 34kV and mid-cycle programs to include more ground-to-sky trimming where strategically appropriate and feasible considering the public ramifications.
Take corrective actions to further reduce gas line hits.	1st Quarter 2008	18.	PECO has taken actions to reduce gas line hits but further reductions could be achieved.	Strive to reduce the number of PECO "at-fault" line hits attributable to inaccurate and no print causal factors.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
VIII. ELECTRIC AND GAS RELIABILITY (continued)				
Enhance the ability to visually portray the gas pipe network, surrounding environmental data, pipe leaks, and replacement projects on geographic maps.	4th Quarter 2008	19.	PECO has enhanced the ability to visually portray the gas pipe network and is in the process of implementing an Enterprise GIS system that will further enhance its ability to geographically display data collected in the field.	Complete a final Business Case encompassing PECO's overall IT strategy and upon approval, select a vendor and implement the Enterprise GIS system, as appropriate, to further enhance the ability to geographically display the gas pipe network.
IX. EMERGENCY RESPONSE				
Continue the analysis presented in this section to measure the management of the dispatch queue time as one of several possible indicators of the effectiveness of the emergency response resource strategy.	4th Quarter 2008	20.	PECO has completed implementation of the Mobile Dispatch System and has begun using the new system to collect historical information but has not performed a detailed dispatch queue analysis.	Perform analysis of the dispatch queue times as historical information is gathered, document the results, and make resource allocation changes as appropriate.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
X. GIS MAPPING				
Complete a more detailed assessment and cost benefit analysis, based on results of the request for quotation, to evaluate a phased program approach to implementing an Enterprise GIS system for PECO.	4th Quarter 2008	21.	PECO has performed a preliminary cost/benefit analysis and has taken steps to select a vendor for implementing an Enterprise GIS system.	Complete evaluation of the benefits of implementing an Enterprise GIS system and establish a timeframe, as appropriate, for deployment.
Document and report on the results of the Mobile Dispatch project following implementation at PECO in 2009.	2nd Quarter 2010	22.	Although PECO has fully implemented the Mobile Dispatch System, a final project evaluation (i.e., system performance, change management issues, and business project changes, etc.) will not be performed until the fourth quarter of 2010.	Document lessons learned (i.e., successes and challenges) from the Mobile Dispatch System implementation and perform a final project evaluation to provide feedback on system performance, business process changes and change management issues to facilitate a better understanding of any limitations.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
XI. EMERGENCY PREPAREDNESS				
None.		23.	PECO Energy has comprehensive physical security, cyber security, emergency response, and business continuity plans and these plans are tested and updated annually.	None.
XII. CUSTOMER SERVICE				
Reduce the backlog in electric-theft caseload.	Complete	24.	It appears that PECO has successfully reduced its electric-theft caseload by reorganizing its Revenue Protection Department and utilizing several reports to monitor for electric-theft.	None.
Implement measures to significantly improve the effectiveness of the gas-theft of service program.	1st Quarter 2008	25.	PECO has taken steps to improve the effectiveness of its gas-theft of service program.	None.

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August 2007 Management Audit Recommendations	Originally Targeted Completion Date	MEI Finding Number	Staff's Follow-up Findings and Conclusions as of December 16, 2009	Staff's Follow-up Recommendation
XIII. SUPPORT SERVICES				
Implement formal quality-assurance activities for major projects.	1st Quarter 2009	26.	The IT (Information Technology) department is in the process of developing and implementing additional QA processes and procedures.	Complete the development and implementation of formal quality assurance functions for major projects.
Develop a plan to ensure consistent implementation of a project management methodology with enhanced capabilities across the IT and other Exelon organizations.	1st Quarter 2008	27.	The Exelon IT organization has developed and implemented defined IT project management methodologies.	None.
Continue to strengthen Exelon's risk management program.	4th Quarter 2007	28.	Exelon's risk management program was enhanced and incorporated into updated policies and procedures.	None.

III. EXECUTIVE MANAGEMENT

Background – The focused management and operations audit of PECO Energy Company (PECO or Company) conducted by Schumaker & Company was issued in August 2007, at D-05MGT048, contained four recommendations regarding the Executive Management functional area. In this chapter, one prior recommendation and prior situation are reviewed and one follow up finding is presented.

Prior Recommendation – Continue a move toward integrated absence management and implement broader workforce availability metrics in the Human Resources Performance Indicator Scorecard (HR Scorecard).

Prior Situation – PECO had many process owners (i.e., line management, Occupational Health Services, Employee Service Center, etc.) across the Company tracking workforce availability; however, results were not integrated and reported in the HR Scorecard provided to senior management. Only disability metrics were being reported in the HR scorecard.

Schumaker & Company considered the Company's strategic emphasis on workforce availability to be positive. However, the consultant suggested that a more integrated focus on total absence management would have presented a truer perspective of the percentage of the workforce that is available for duty on any given day.

It was noted that PECO was committed to employee wellness as evidenced by its 24 hour call-a-nurse program, Employee Assistance Program, and its partnering with the Mayo Clinic as a wellness partner. PECO also provided on-site fitness facilities at many locations and an on-site fitness vendor offering employees preventative health services such as blood pressure screenings, cholesterol screenings, and body mass index measurements.

Follow-Up Finding and Conclusion No. 1 – **PECO is now using integrated absence management and expanded workforce availability benchmarking metrics.**

During 2008, the Company's Occupational Health Services (OHS) group began a number of absence management and workforce availability initiatives including utilizing PeopleSoft Absence and Family Medical Leave Act (FMLA) Tracking Modules and a proprietary OHS software tool, to track statistics related to short-term disability, duration of disability, return to work, total disability days per month, etc. OHS is also utilizing Employer Measures of Productivity, Absence, and Quality to evaluate internal program performance and validate program improvement via external benchmarks. The system is formula driven and uses standardized metrics for benchmarking. Disability statistical tracking and workforce availability metrics are primary components. Benchmarking data is used to compile the monthly Productivity and Disability Report. Included in the report are total number of disability claims and percentage of employees whom returned to

work, duration of disability, FMLA applications received, and total disability days per month.

The PECO Human Resources Department evaluated and identified key workforce availability performance metrics to be monitored on a regular basis and added them to the HR Scorecard. Among these metrics are employee availability, short-term tenure turnover (i.e., 1 year or less tenure), retention of high potential key managers and higher level management employees (i.e., focus on retention of identified high retention risk employees at manager level and above), full-time equivalent headcount report versus budget, and ready now rate (i.e., positions filled by ready now candidates divided by the total available positions.

Maintaining an integrated focus on total absence management gives a truer perspective of the percentage of the workforce available at any given time while workforce availability benchmarking reflect the Company's performance related to strategic objectives. PECO's wellness programs and on-site fitness centers should also contribute to maintaining a healthy workforce.

Staff's Follow-up Recommendation – None.

IV. CORPORATE GOVERNANCE

Background – The focused management and operations audit of PECO Energy Company (PECO or Company) conducted by Schumaker & Company was issued in August 2007, at D-05MGT048, contained two recommendations regarding the Corporate Governance functional area. In this chapter, the two prior recommendations and prior situations are reviewed and two follow up findings and one recommendation are presented.

Prior Recommendation – Organize the Internal Audit function to report administratively to an independent organization, the Chief Executive Officer (CEO), or directly to the Board of Directors.

Prior Situation – Exelon's Internal Audit group reported functionally to the Board of Director's Audit Committee with the Vice President (VP), Internal Audit & Controls meeting with the Audit Committee at every committee meeting as well as at specially called meetings and teleconferences and had free access to the Audit Committee Chairman at any time. However, administratively for day to day operations the Internal Audit group reported to the Executive Vice President (EVP) Finance & Markets/Chief Financial Officer (CFO), which weakened its independence from the financial organization that is the primary subject of its scrutiny.

Internal Audit staffing and budgets were prepared by Exelon management; however, the Audit Committee discussed Internal Audit needs both in open meetings and in executive session. The EVP Finance & Markets/CFO had official authority over Internal Audit employees for annual performance and salary reviews. He consulted with the Audit Committee Chairman on the annual performance and salary review of the Vice President, Internal Audit & Controls.

Follow-Up Finding and Conclusion No. 2 – **The Internal Audit function reports administratively to the EVP Finance & Legal.**

In June 2009, a reorganization of Exelon's senior leadership team placed the Internal Audit function administratively under the EVP Finance & Legal. The reporting relationship is delineated in the Exelon Internal Audit Services Audit Charter stating the VP, Internal Audit & Controls functionally reports to the Audit Committee Chairman of the Board of Directors and administratively to the EVP Finance & Legal. The EVP Finance & Legal has official authority over the VP, Internal Audit & Controls for annual performance and salary reviews, although he will at times consult with the Audit Committee on these matters.

Also reporting directly to the EVP Finance & Legal is the Senior Vice President (SVP) & CFO who has responsibility for the Company's financial records. The administrative ties of Internal Audit to the Finance organization provides the potential for actual and/or a perceived lack of independence. Although there is Audit Committee oversight, the opportunity for inappropriate pressure being placed on the Internal Audit function has not materially changed from the previous organization structure. Placing Internal Audit under an independent organization, the CEO, or reporting for all aspects

directly to the Board of Directors as recommended by Schumaker & Company would make it truly independent of the Company's financial management.

Staff's Follow-up Recommendation – Restructure the reporting relationship of the Internal Audit function so that it no longer reports administratively, directly or indirectly, to management responsible for the financial accounting or finance operations of the company.

Prior Recommendation – Formally review bidding for external audit services every five years to consider alternative firms as Exelon's external auditors.

Prior Situation – The Exelon Board of Directors, through the Audit Committee, provided oversight over the external auditors' activities. The Audit Committee met frequently with the external auditors to review their work, material findings, etc. and received quarterly reports on their fees and expenses. The Audit Committee pre-approved all work before the external auditor could commence work. Lead and review partners were rotated every five years.

Exelon had no formal policy to rebid external auditing services on a regular basis or to consider alternative firms as its external auditors.

Follow-Up Finding and Conclusion No. 3 – The Audit Committee Charter was amended to require periodic (at least every five years) formal reviews on bidding for external audit services.

At the January 29, 2008 Exelon Board of Directors meeting, amendments to various board committee charters, including the Audit Committee Charter, were unanimously approved. An amendment to the Audit Committee Charter stipulates that at least every five years, in the same year the lead audit partner is required to be rotated, the Audit Committee will review a report prepared by the Corporate Controller whether it would be practicable to rebid independent auditor services. A copy of the confidential report presented to the Exelon Audit Committee at its November 30, 2009 meeting was provided for review. The report indicated that it was not practicable at that time to solicit bids for external audit services citing factors such as the incumbent's favorable fee structure (i.e., benchmarked against peer firms) , extensive energy/utility industry expertise and experience, and Exelon's high level of satisfaction with the current firm. The Audit Committee concurred with the Corporate Controller report and no bids were solicited. As a result, Exelon has continued its use of PricewaterhouseCoopers LLP as the external audit firm which began in 2000.

Periodic formal reviews of potential bidding for external audit services enables, Exelon to ensure it is paying a reasonable amount for its external audit services and ensure its external auditors do not become complacent in providing truly independent audit services.

Staff's Follow-up Recommendation – None.

V. AFFILIATED INTERESTS

Background – The focused management and operations audit of PECO Energy Company (PECO or Company) conducted by Schumaker & Company was issued August 2007, at D-05MGT048, contained six recommendations regarding the Affiliated Interests functional area. In this chapter, the six prior recommendations and prior situations are reviewed and six follow-up findings and two recommendations are presented.

Prior Recommendation – Provide updated affiliated interest and associated organization structure documents to Pennsylvania Public Utility Commission (PUC or Commission) staff.

Prior Situation – PECO entered into a General Services Agreement (GSA) with Exelon Business Services Company (EBSC), which provides goods and services to its regulated (including PECO) and unregulated affiliates. To specify lower-level details such as the basis of pricing, billing arrangements, and accounting requirements, EBSC had set up service level arrangements (SLAs).

In addition, PECO entered into a Mutual Services Agreement (MSA) with various affiliates (e.g., Exelon, Exelon Generation, Exelon Enterprises, etc.) to provide and receive non-power goods and services. To specify lower-level details such as the basis of pricing, billing arrangements, and accounting requirements, PECO and its affiliates set up work orders in the form of affiliate level arrangements (ALAs).

A GSA form and a MSA form were submitted to the PUC in 1999 as part of PECO's filing to the Commission in the Unicom/PECO merger. In its June 22, 2000 Order in the Unicom/PECO proceeding, the PUC approved the forms of the GSA and the MSA The GSA was subsequently dated and signed by the companies in 2001; the MSA was never executed. It was Exelon management's position that only the GSA and MSA needed to be filed with the PUC, therefore the SLAs and ALAs were not submitted to the PUC for approval. However, it was Schumaker & Company's opinion that the SLAs and the ALAs contain much of the detailed information required to fully understand how affiliate relationships and transactions are implemented within the Exelon organization and therefore the consultant believed they should be submitted to the PUC for review.

Follow-up Finding and Conclusion No. 4 – The GSA and MSA affiliated interest agreements on file with the Commission are forms and have since been updated by PECO, but not filed with the Commission for approval.

In 2009 during fieldwork, PECO provided affiliated interest (e.g., GSA, MSA, SLAs, and ALAs) and associated organization structure documents to the PUC Audit Staff for its review. The auditor's review noted that the GSA and MSA were copies of the agreements previously approved by the PUC on June 22, 2000.

The GSA and MSA, that were submitted and approved by the Commission during the Unicom/PECO merger, omitted the names of companies, dates, and signatures which were to be addressed when the merger was finalized. PECO's current working copies of the GSA and MSA have addressed these omissions with exception of the MSA which has not been executed or signed by the applicable parties. In addition, PECO made the following changes since the documents were filed at the Commission, including:

- adding additional language to some sections,
- adding sections (i.e., Corporate Governance Services and Client Companies sections of the GSA),
- adding attachments,
- adding exhibits,
- and adding allocation ratio details.

Moreover, the GSA and MSA both contain language which reflects that Exelon is subject to the Public Utility Holding Company Act of 1935 (PUHCA 1935) as administered by the U.S. Securities and Exchange Commission (SEC). However, PUHCA 1935 was repealed in 2005 when the Public Utility Holding Company Act of 2005 (PUHCA 2005) was enacted. Pursuant to the repeal, the SEC no longer has oversight authority over electric and gas holding companies. Instead, PUHCA 2005 oversight falls on the Federal Energy Regulatory Commission (FERC).

Consequently, at the minimum, PECO should update and internally execute its affiliated interest documents and associated organization structure documents to reflect these changes. Each affiliated interest document should then be submitted as a filing to the PUC for review and approval.

Agreements between a regulated utility and its affiliates require approval by the PUC to become valid. The authority to approve contracts between public utilities and their affiliates comes under the PUC's general authority to regulate public utilities in the Commonwealth 66 Pa. C.S. § 2102(a) and (b), which state, in part, that:

> **(a) General rule** - No contract or arrangement providing for the furnishing of management, supervisory, construction, engineering, accounting, legal, financial, or similar services . . . between a public utility and any affiliated interest shall be valid or effective unless and until such a contract or arrangement has received the written approval of the commission . . .
> **(b) Filing and action on contract** - It shall be the duty of every public utility to file with the commission a verified copy of any such contract or arrangement, or a verified summary as described in subsection (a) of any such written contract or arrangement . . . The commission shall approve such contract or arrangement made or entered into after the effective date of this section only if it shall clearly appear and be established upon investigation that it is reasonable and consistent with the public interest . . . No such

> contract or arrangement shall receive the commission's approval unless satisfactory proof is submitted to the commission of the cost to the affiliated interest of rendering the services or of furnishing the property or service described herein to the public utility. No proof shall be satisfactory within the meaning of the foregoing sentence unless it includes the original (or verified copies) of the relevant cost records and other relevant accounts of the affiliated interest . . . . .

Staff's Follow-Up Recommendation – File updated affiliated interest documents including, but not limited to, the MSA and GSA, and associated organization structure documents to the Commission for review and approval.

Prior Recommendation – Update internal documentation now that the Public Utility Holding Company Act of 2005 (PUHCA 2005) is in effect.

Prior Situation – The internal manuals describing Exelon affiliate relationships and transactions provided to the auditors during the course of the management audit's field work (i.e., May 2006 through December 2006) indicated that Exelon is subject to the Public Utility Holding Company Act of 1935, although it was repealed in 2005, when PUHCA 2005 was enacted. Final rules implementing PUHCA 2005 were issued by the FERC on December 8, 2005, but became effective on February 8, 2006, clarifying many issues related to the regulation of holding companies under the authority granted to FERC under the Energy Policy Act of 2005, which was passed by the U.S. Congress on July 29, 2005 and signed into law on August 8, 2005.

Follow-up Finding and Conclusion No. 5 – Internal documentation relating to Exelon affiliate relationships and transactions has been updated to reflect the impact of PUHCA 2005.

The Audit Staff reviewed all the internal documentation relating to affiliate relationships and transactions that was reviewed during the course of the management audit and was identified as containing the outdated references to PUHCA 1935. These documents included, but were not limited to, the Business Services Company Billing System Procedure, the Non-Service Company Affiliate Transactions Process, the Exelon Non-Service Company Affiliate Transactions Policy, and the Intercompany Transactions Policy. All documents reviewed had been updated, stating Exelon is subject to the provisions of PUHCA 2005.

Staff's Follow-Up Recommendation – None.

Prior Recommendation – Perform a study examining whether there is a material difference between "at cost" and market pricing for service transactions that exceed $500,000 per year with selected Exelon service affiliates and minimally begin using

market pricing where PECO is materially harmed by making affiliate charges at cost rather than market.

Prior Situation – PECO provided services (e.g., rubber testing, claims support, meter maintenance, supply related services, etc.) to its affiliates, both regulated and non-regulated. PECO did not charge non-regulated affiliates for services provided using the higher of cost or market (HCOM) standard as prescribed by FERC. Exelon's position was that PECO and the other Exelon companies are not governed by the FERC restrictions on pricing of non-power goods and services between franchised public utilities and their power-marketing affiliates, because FERC has granted them a waiver of those restrictions. Schumaker & Company's position was that the FERC waiver does not apply to non-power goods and services.

Follow-up Finding and Conclusion No. 6 – PECO has developed a process to compare cost of services provided to its affiliates that exceed $500,000 per year to market.

In response to the 2006 management audit, PECO developed a process to examine whether there was a material difference between "at cost" and market pricing for services provided to its affiliates that exceed $500,000 per year. In conjunction with the annual affiliate level arrangement renewal process, PECO will determine, based on the prior 12 months actual costs, whether there is a material difference between "at cost" (i.e., no mark-up or profit) and market pricing for service transactions that exceed $500,000 per year.

PECO identified two services, Real Estate and Fleet, for the years 2007 and 2008, which met the $500,000 criteria to compare PECO pricing of the service to market. The Real Estate function consists of the rental of PECO owned facilities to Exelon affiliates and other as needed services (e.g., real estate consulting, real estate record management, etc.) provided by the Real Estate and Facilities Group. PECO compared the Company's total cost per square foot charged for space at PECO's main office building to comparable office space available in the City of Philadelphia. For 2007 the rental rate for space at the main office building was within the range of comparable local office building rates. For 2008 the rental rate for space at the main office building was less than the rental rates for comparable local office buildings.

As a result, PECO increased its main office building rental rates for 2009 to an average of the comparable local office building rates, generating an additional $273,266 in annual rental fees. Because rental rates for the main office building are based on the previous years' building costs, 2010 rental rates as of mid-December 2009 for the main office building were not yet determined and a comparison to local office building rates was not yet conducted.

The Fleet function provides for the rental of PECO owned vehicles to Exelon affiliates and other services such as, fueling of vehicles and preventive maintenance. In 2008, the costs of vehicle services provided to affiliates was compared to the local market. The results showed that market rates are difficult to determine in some cases due to the vintage (i.e., 1990s to early 2000s) and/or specialized nature of the vehicles

being rented to affiliates. However, when comparable rates were obtained, PECO determined that the rental rates they charged were comparable to local rental rates of similar vehicles.

Staff's Follow-Up Recommendation – None.

Prior Recommendation – Develop a formal PECO program to periodically and systematically evaluate use of shared services within the Exelon organization versus use of outsourcing options.

Prior Situation – Exelon periodically reviewed the relative cost of its affiliate services versus the marketplace, but did not look at the costs to PECO specifically. In addition, PECO did not have a formal program to compare the use of Exelon for shared services against outsourcing options.

Follow-up Finding and Conclusion No. 7 – PECO has developed a formal approach for evaluating the cost effectiveness of using Exelon shared services.

As a result of the 2006 management audit, Exelon developed a formal approach, referred to as the Market Testing Service Classification Procedure, for evaluating PECO's use of Exelon shared services versus the use of outsourcing options. The first review was initiated in the 4th quarter of 2008.

This review entailed identifying PECO's 2009 budgeted costs for shared services that were appropriate for market testing. Exelon grouped the services provided to PECO into four categories: governance (i.e., functions that establish the policies and direction of the organization), strategic (i.e., oversees corporate strategy), business support (i.e., management of third party contracts and external providers), and transactional (i.e., media production services, payroll processing, advertising, and leadership development). PECO excluded services classified as governance, strategic, and business support, from external market testing as it deemed those services best performed by internal resources, and all transactional service costs under $500,000 (the threshold established in conjunction with Schumaker & Company) as well.

Consequently, three services within the Human Resources function, one service within the Legal function, and one service within the Security function were deemed appropriate for external market testing. It is specified in the review guidelines that it is PECO's responsibility to perform the external market testing. However, no market testing occurred for the 2009 budgeted services that were identified as being appropriate for testing. It was PECO management's intent to wait until completion of the review of 2010 budgeted costs for selected Exelon shared services, which is to reportedly occur in the 4th quarter of 2009, to initiate the annual external market testing. Market analysis and market testing will assist PECO in determining the cost effectiveness of shared services. According to PECO's procedure, each year it will identify shared services that are appropriate for market testing.

Staff's Follow-Up Recommendation – Complete market testing in 2010 for select Exelon shared services and continue to evaluate on an annual basis.

Prior Recommendation – Perform a cost benefit analysis regarding consolidation of its billing/allocation and time reporting systems.

Prior Situation – Exelon utilized two billing/allocation systems, the Business Services Company (BSC) Billing System and the Exelon Performance Solutions (EPS) Billing System. Both the BSC Billing System and the EPS Billing System were developed to support service company billings after the PECO/Unicom Corporation (a holding company for the regulated electric utility, Commonwealth Edison Co., Inc.) merger. In addition, Exelon utilized five time reporting systems. The two main time reporting systems were the East based (Philadelphia) Time and Labor System and the West-based (Chicago, home of Exelon) Semi-monthly Variation System. Primarily, the time reporting systems utilized exception time reporting (i.e., where an employee's time defaults to the same codes each month unless manually redirected), with only some use of positive time reporting (i.e., whereby each pay period the employee reports the appropriate cost code for each of their hours).

Follow-up Finding and Conclusion No. 8 – Exelon performed a cost/benefit anaylsis and recently implemented a new Intercompany Billing System and Enterprise Time and Labor System.

Exelon Business Services Company (EBSC) performed a cost-benefit study to evaluate improvements in the processes and systems associated with the intercompany billing and time and labor systems. The study reviewed the use of separate systems to perform each function (i.e., the Intercompany Billing System (ICB) and the Enterprise Time and Labor System (ETL)). The cost-benefit analyses were completed in July 2007 for the ETL and in October 2007 for the ICB. For both projects the results of the cost-benefit analysis showed a negative net present value (NPV) meaning the project costs exceed any estimated savings.

Despite the lack of any projected cost savings, Exelon felt there were nevertheless several reasons for proceeding with the two projects. Mainly, the current billing/allocation and time reporting systems were old and nearing the end of their useful life and had associated quality and control risks. In addition, the two new systems each had multiple benefits. The benefits of the ICB include:

- Increased traceability of costs for services.
- Project billings based on actual incurred costs for the month. With the old system, costs were based on forecasted amounts and trued-up to actual incurred costs in the following month.
- All major Exelon companies will use the ICB for affiliate billing. Previously, only EBSC used the intercompany billing system, while the other companies used manual processes.
- Reporting and analysis capabilities are improved.

The benefits of the ETL include:

- Ability to respond to new business and regulatory requirements.
- Simplification of payroll tax reporting.
- Employee self-service time entry.
- Positive time reporting (i.e., whereby each pay period the employee reports the appropriate cost code for each of their hours).

Both the ICB and ETL Systems were implemented in phases. The ICB implementation began in March 2008 and was completed in May 2009. The ETL began implementation in November 2007 with completion in June 2009. To assure that the new systems are used correctly by the users, Exelon provided mandatory hands-on training for the relevant ICB users and instructor-led and computer based training for the ETL.

Having multiple billing/allocation and time reporting systems can be cumbersome, difficult to understand, and increases the potential for errors. The implementation of the ICB and the ETL should reduce these risks.

Staff's Follow-Up Recommendation – None.

Prior Recommendation – Regularly perform internal audits of affiliate transactions and associated cost allocations.

Prior Situation – Schumaker & Company reviewed the audits performed on PECO by Exelon's Internal Audit Services during the five years prior to 2006. This review found that none of the reports specifically addressed the two billing systems used by Exelon, the time reporting systems used to support these systems, or the allocation factors used for direct or indirect allocations.

Follow-up Finding and Conclusion No. 9 – Exelon has adopted a policy for its Internal Audit Services to perform internal audits of affiliate transactions and associated cost allocations every two years.

Since the 2006 management audit, Exelon's Internal Audit Services has completed, as part of its 2008 audit plan, two internal audits of affiliate transactions and associated cost allocations (i.e., 2008 PECO Affiliated Transactions Compliance Review and 2008 Exelon Business Services Company (EBSC) Cost Allocation Review). The Affiliated Transactions Compliance Review identified areas for improvement and contained agreed upon action plans. The financial impact of the items identified for improvement was small and immaterial. The EBSC Cost Allocation Review also identified areas for improvement related to timekeeping, which should be addressed through the new time keeping systems (see Follow-up Finding and Conclusion No. 5).

The Internal Audit Services' audit plan for 2010 contains another review of affiliate transactions and associated cost allocations. Performing these reviews on a regular basis should help ensure that the ratepayers of PECO are not subsidizing the costs of any of its affiliates.

Staff's Follow-Up Recommendation – None.

VI. FINANCIAL MANAGEMENT

Background – The focused management and operations audit of PECO Energy Company (PECO) conducted by Schumaker & Company was issued in August 2007, at D-05MGT048, contained two recommendations regarding the Financial Management functional area. In this chapter, one prior recommendation and prior situation are reviewed and a follow up finding and a recommendation are presented.

Prior Recommendation – Investigate and assess the cost effectiveness of staff augmentation, as currently used, for the Internal Audit function.

Prior Situation – Schumaker & Company concurred with PECO's use of outside auditors to gain specific auditing expertise; however, because the cost of using augmentation staff was expensive and the consultant believed that alternatives should be explored. Augmentation staff was contracted from Certified Public Accounting (CPA) and professional staffing firms. The reasons cited by Exelon for staff augmentation was to supplement Information Technology (IT) auditor staffing and to gain specific expertise not available in Internal Audit personnel and too expensive to acquire on a full-time basis.

The difference between Exelon's cost per productive hour ($150) of the Internal Audit staff and the average cost ($209 per hour) for augmentation staff, given the number of hours being purchased, resulted in a net cost difference of over $200,000 for 2006. The consultant felt the additional cost warranted an analysis into whether it was feasible to acquire staff with the applicable skills and bring some of the work in-house with additional Internal Audit staff.

Follow-Up Finding and Conclusion No. 10 – **The Company performed an assessment of its utilization of external audit resources to meet the workload requirements of its Internal Audit Department.**

The 2009 analysis of external audit resource utilization centered on areas and skill sets needed verses the number of contract hours utilized. External audit services were primarily utilized for IT audits, i.e., approximately 82% of contract hours in 2007 and 65% of contract hours in 2008. These audits required specialized expertise in the areas of security and performance configuration assessments. The Company's analysis of contract hours concluded that although in-house personnel lacked expertise a full time new hire was not justified because only 1,593 and 1,183 hours were augmented for IT audit services in 2007 and 2008, respectively. Exhibit VI-1 summarizes the total contract hours by skill set and also contract hours focused on a set of skills that could have been done in-house if resources were available. The Company's assessment of the utilization of external audit resources focused on those hours that could have been performed in-house if resources were available. This assessment estimated a savings of approximately $85,000 in 2007 and $115,000 in 2008 which could have been realized if Exelon had utilized in-house resources in lieu of the augmentation hours shown in Exhibit VI-1. The savings result from the difference

between the cost per productive hour of Internal Audit staff and the cost of out-sourcing certain audit services for the respective years.

Exhibit VI-1
PECO Energy Company
Contract Hours by Skill Set
2007 and 2008

Audit Skill Set	Total Contract Hours		Audit hours that could have been done in-house if resources were available	
	2007	2008	2007	2008
IT auditing	1,593.5	1,183	670	887
Process auditing	359.0	633	299	338
Totals	**1,952.5**	**1,816**	**969**	**1,225**

Source: Data Request FM-1

Included in the Company's analysis of utilization of external audit resources was a summary of Internal Audit vacant positions. Vacant positions in 2007 totaled 5,323 hours (790 IT auditing and 4,533 process auditing) while 3,515 hours (1,390 IT auditing and 2,125 process auditing) were identified in 2008. Among the vacant positions and length of time the position was vacant as found during PECO's assessment were:

- IT Audit Senior – opened June 2006, filled March 2007, vacant 9 months
- Process Audit Senior – opened October 2006, filled December 2007, vacant 14 months
- Process Audit Senior – opened October 2006, filled April 2009, vacant 30 months
- IT Audit Senior – opened January 2008, filled July 2008, vacant 6 months

The Audit Staff acknowledges the periodic need for external audit resources to augment IT auditor staffing and to gain specific expertise not available in Internal Audit personnel. However, an Internal Audit staff more aligned to its authorized compliment and department workload would reduce the need for outside audit services and related expenses. Senior auditor positions have remained vacant for long periods of time which contribute to the need for out-sourcing audit services.

Staff's Follow-up Recommendation – Increase efforts to fill vacant positions in the Internal Audit Department more quickly in order to mitigate the need to augment audit services and strive to more closely align staff expertise to the Company's needs.

VII. ELECTRIC AND GAS OPERATIONS

Background – The focused management and operations audit of PECO Energy Company (PECO) conducted by Schumaker & Company was issued in August 2007, at D-05MGT048, contained five recommendations regarding the Electric and Gas Operations functional area. In this chapter, two prior recommendations and prior situations are reviewed and two follow up findings and one recommendation are presented.

Prior Recommendation – Evaluate the annual overtime charges for reasonableness and determine if it is an efficient use of resources.

Prior Situation – Overtime had gone up significantly for PECO electric operations field forces during the period 2003 through 2006. Overtime spending for non-storm situations for the Distribution Systems Operations (DSO) and Construction and Maintenance (C&M) groups had risen at a faster rate than spending for storm situations (the exception being the Exelon Energy Delivery (EED) Transmission & Substation (T&S) group).

Overtime spending in storm situations was generally seen by the consultant as a function of the frequency and severity of storms during the course of the year, with only a limited ability on the part of PECO to control this spending. However, overtime from non-storm situations was considered to be discretionary to some extent and therefore viewed as much more controllable. A large part of non-storm overtime is spent on emergent or unplanned work. Non-storm overtime expenses had increased from $7,574,400 in 2003 to $13,179,400 in 2006 for an increase of $5,605,000, or 74%.

Schumaker & Company found that the potential benefits of better managing the non-storm overtime could be significant. The consultant estimated that even if new staff was needed to eliminate the $5.6 million increase in overtime that even this would result in approximately $2 million in net annual savings. However, the consultant felt that there might be some justification for higher than normal overtime at PECO due to changes in overtime policies and other changes that had occurred, and therefore to be more conservative Schumaker & Company ultimately estimated the overall potential annual savings for better management of the Company's electric operations field forces at $800,000 to $2,000,000.

Follow-Up Finding and Conclusion No. 11 – **Non-storm overtime as a percentage of total Electric Field Operation's Department payroll remains high.**

PECO analyzed its annual overtime charges and primary drivers of overtime and concluded that its available resources were used in an effective and efficient manner. The Company cited minimizing the number and duration of system outages and maintaining infrastructure to increase system reliability and customer satisfaction as the main reasons for non-storm overtime. From 2006 to 2008 non-storm overtime expenses increased from $13,179,402 to $14,803,872, or 12.3%, which was

significantly below the 74% increase experienced from 2003 to 2006. Among the non-storm overtime categories impacting increased overtime expenses were:

- Field Support – An adjustment to the Extended Hours Policy to allow select salaried employees including field supervisors, dispatchers, arrangers, and Professional/Supervisory/Management employees to be paid for their extended hours worked.
- Electric Emergencies – Aging underground infrastructure repairs including the replacement of aging facilities and an increased volume of fault locates.
- The PECO System Health Initiative – A system health report that measures specific aspects of the distribution system's three major categories: Electric Distribution, Distribution Monitoring and Control System, and Gas Distribution. The Initiative outlines aggressive timelines required to return systems back to proper configuration or normal working order post the emergency storm recovery period. Storm overtime is defined as ending when all affected customers are back in power. Non-storm overtime includes post storm cleanup, etc.

Since the management audit, PECO has implemented the following initiatives, strategies, and management tools/processes in an effort to control overtime costs.

Strategies

- Fully staffed Fix-It-Now (FIN) teams that handle small maintenance jobs in an expeditious manner.
- Enhanced use of "hot stick" crews to work high impact system average interruption duration index (SAIFI) corrective maintenance.
- Utilization of Supervisors and Operations Control Center personnel to assess call outs to determine if jobs were performed on schedule or incurred overtime hours.

Initiatives

- Mobile Dispatch Initiative to provide field crews with global positioning system (GPS) equipment, electronic dispatching, the ability to enter data while on the job site, etc.
- Productivity Initiative to improve metrics and efficiency.
- Dispatcher Retention Strategy to aid in attracting and retaining experienced Operations Control Center dispatchers.

Management Tools/Processes

- Data tracking to increase the efficient use of resources during non-storm overtime. Data being tracked includes weekly storm and non-storm overtime spend by team/building, top 10 projects that were worked on non-storm overtime, and non-storm overtime hours actual versus budget.

To further gauge non-storm overtime spending for electric operations field forces (i.e., C&M, DSO, and EED), total non-storm overtime expenditures in lieu of non-storm overtime hours for randomly selected years as a percentage of total departmental payroll less storm overtime was calculated for the years 2003, 2004, 2006, and 2008 as shown in Exhibit VII-1. The trend shows a significant increase from 2003 to 2006 (as identified by the consultant during the 2006 management audit) with only a minor reduction in non-storm overtime as a percentage of department payroll achieved through 2008.. While the Audit Staff acknowledges that some level of non-storm overtime spend is justified, it believes reducing the non-storm overtime percentage to more reasonable levels of 15% (i.e., prior levels historically achieved and suggested by Schumaker & Company) would yield an annual savings net of new hire costs ranging from $500,000 to $1,500,0000 based on 2008 data. However, to more effectively assess the level of overtime incurred, the Company should measure and monitor overtime levels by locality (e.g., service center) and overall in hours as a percentage of regular man-hours per year in order to mitigate variables inherent in assessing overtime expenditures such as wage rate differentials, inflation, overheads, etc.

Exhibit VII-1
PECO Energy Company
Annual Non-Storm Overtime Spending as a Percentage of Total Departmental Payroll
For the Years 2003, 2004, 2006 and 2008

Department	2003[1]	2004	2006	2008
Construction & Maintenance	$3,906,073	$5,506,692	$7,313,177	$7,772,864
Distribution Systems Operations	1,876,063	3,023,457	4,058,794	4,668,104
EED Transmission & Substation	1,792,264	1,236,330	1,807,431	2,362,903
Total Non-Storm Overtime Spend	$7,574,400	$9,766,479	$13,179,402	$14,803,871
Construction & Maintenance	$35,279,573	$31,047,198	$31,578,017	$37,439,472
Distribution Systems Operations	16,494,248	17,216,941	18,186,397	21,845,885
EED Transmission & Substation	9,673,097	8,729,625	9,062,423	14,404,863
Total Department Payroll Less Storm Overtime Expense	$61,446,918	$56,993,764	$58,826,837	$73,690,220
Non-Storm Overtime as Percentage of Department Payroll Less Storm Overtime	12.3%	17.1%	22.4%	20.1%

Source: Data Requests OP-2 and OP-7, Schumaker & Company Audit Report, Auditor Analysis
[1] Data based on a straight-line extrapolation of April through December 2003 available data.

Staff's Follow-up Recommendation – Manage annual non-storm overtime spend to more reasonable levels through the use proper controls, reviews, and authorizations including monitoring and tracking of annual overtime hours as a percentage of regular man-hours by locality/service center and Company-wide.

<u>Prior Recommendation</u> – Proactively assess hiring needs to address the potential attrition of very experienced field operations employees over the course of the next several years, and enhance the Staff Planning documentation to provide a more comprehensive and detailed analysis of projected attrition and hiring needs.

<u>Prior Situation</u> – PECO had been hiring on an annual basis to address potential retirements by experienced Line Mechanics. Staffing needs were evaluated annually with in-depth staffing level reviews for critical positions, including Line Mechanics, done on a monthly basis. The information was presented to Electric Operations leadership on a quarterly basis. In an effort to address the aging Line Mechanic workforce issue, PECO had operated seven line schools since 2005 that graduated 92 new aerial and underground Line Mechanics.

The PECO Staffing Plan, issued in June 2006 which was intended to be a roadmap for future hiring, did not adequately document the future course of action for addressing the field forces projected hiring needs.

<u>Follow-Up Finding and Conclusion No. 12</u> – PECO has updated its staff planning model with more detailed tools including a staffing gap analysis; identifying critical positions; estimating attrition and retirement; anticipating hiring needs; and recruiting, retaining, and developing staff.

PECO's long term staffing plan is developed through the coordinated effort of line management and the Human Resources (HR) department. The planning process relies on frequent and coordinated communication between the two departments.

Hiring needs are reviewed on an annual basis. Elements of the process include:

- Identification of critical positions within departments: HR personnel and line management identify current and future staffing needs for critical positions. Criteria for determining whether a position is critical include: the duties of the position and its role in maintaining PECO service continuity; current staffing levels; anticipated attrition and retirements; barriers/challenges in recruiting for those positions; etc.
- Estimates of potential attrition and retirement: HR estimates attrition and retirements based on both past and future predictors. Anticipated attrition and retirement data determine the estimated staffing gap within the job classification in a given year.
- Anticipated hiring needs: After staffing gaps are identified, hiring needs within each critical job classification are determined. Hiring needs are recorded into departmental workforce planning documents which are then combined into workforce planning documents for all craft positions, back office positions, and exempt employee positions. Hiring projections by position generally exceed the projected staffing gap for that position to account for recruiting and training lead times and attrition in newly hired groups.
- Recruiting and training challenges: Long range staff planning takes into account recruiting and training challenges such as longer lead times, class

size, candidate attrition, etc. when developing candidate pools for certain job classifications (e.g., aerial line mechanics).

The Audit Staff reviewed staff planning documents classified by PECO as "Confidential and Proprietary" which included the following:

- Staffing Gap Analysis Template – An analysis by business unit ranging from the Office of the President down to Construction & Maintenance, Distribution System Operations, Technical Services, and Support Services projecting forward 5 years (2010 through 2014) the number of positions included in the long range plan, the projected attrition rate, the projected retirement rate, and the gap or openings anticipated.
- PECO Critical Craft Positions – Projected hiring needs by job title (i.e., aerial line mechanic, energy technician, gas foreman, engineering technician, etc.). The projected number of hires is indicated for 2010 and 2011. Also indicated are recruiting strategies, retention strategies, training and development strategies, and diversity strategies. Within each of the strategies are a due date, action to be taken, key milestones, and business owner.
- PECO Critical Back Office Positions – Projected hiring needs for 2010 and 2011 for design & construction consultant, senior facilities drafter, senior designer, etc. Strategies are the same as for PECO Critical Craft Positions.
- PECO Critical Exempt Positions – Projected hiring needs for 2010 and 2011 for senior safety professional, dispatcher, chief plant operator, engineer, etc. Strategies are the same as for PECO Critical Craft Positions.

The above documents provide insight into the long-term staff planning process by identifying critical positions within departments, estimating potential attrition and retirements, anticipating hiring needs, and recruiting, retaining, and developing staff for the future.

To enhance the recruiting initiative, the position of Recruiting Lead was created in the PECO HR department. The Recruiting Lead is responsible for setting strategic direction, ensuring policies and programs are administered consistently and managing the day to day operation of the recruiting function. This position is the primary liaison with external organizations and community outreach efforts. External recruiting outreach initiatives include:

- Enhancement of PECO's University Recruiting program through participation in University fairs at Drexel, Temple, Penn State, Widener, etc.
- Strengthening partnerships with core diversity organizations such as Congresso, Greater Philadelphia Urban Affairs Coalition, Metropolitan Career Center, etc.
- Enhanced recruiting strategy with Technical and Trade Schools such as CHI Institute, PA Institute of Technology, Williamson Free Trade School, etc.
- Military recruiting strategy.
- Employee Referral Program.

By enhancing its staffing plan, PECO now has a more comprehensive and detailed analysis of its projected attrition and hiring needs, that should enable the Company to maintain an adequate complement of field operations personnel.

Staff's Follow-up Recommendation – None.

VIII. ELECTRIC AND GAS RELIABILITY

Background – The focused management and operations audit of PECO Energy (PECO or Company) conducted by Schumaker & Company was issued in August 2007, at D-05MGT048, contained 12 recommendations regarding the Electric and Gas Reliability area. In this chapter, seven prior recommendations and prior situations are reviewed and seven follow-up findings and five recommendations are presented.

Prior Recommendation – Enhance the ability to visually portray the results of PECO's electric reliability program.

Prior Situation – Although Schumaker & Company found that PECO had good reliability programs, the Company could not easily create a geographic (i.e., map based) representation of the reliability performance of its service territory to identify geographic performance or potential pocket problem areas. In an effort to identify repetitive outage problem areas over a three year time span, the consultant, in coordination with PECO, attempted to compile outage statistics on a geographic basis in order to visually portray this information on a PECO service territory map within the capabilities of PECO's current mapping system. This effort proved to be highly labor intensive.

Although the geographic results did provide some insight into the reliability performance of various areas within the service territory, it was not possible to reflect the performance to a greater level of detail (i.e., half a square mile) other than the political subdivision. The consultant believed that although PECO was striving to direct its reliability programs to its problem areas, it would enhance its ability to identify, monitor, and rectify problems areas by visually portraying this information on a routine basis.

Follow-up Finding and Conclusion No. 13 – **PECO has taken steps to select a vendor for implementing an Enterprise Geographic Information System (GIS) that will help visually portray the results of PECO's electric reliability program.**

Visual portrayal of outage information on maps is significantly beneficial to both employees and customers. It helps employees locate outages and makes the outage restoration process faster and more efficient while providing customers with the means to monitor outage events. When the electrical system is not visually portrayed, it makes the process of gathering outage information rather labor intensive. An Enterprise GIS will help establish a common electric and gas GIS asset repository that can be utilized throughout the Company. PECO's preliminary Enterprise GIS plan is to align the facilities to a standard coordinate system and improve operational and analytical efficiencies by providing corporate wide access to geo-spatial data. Additionally, PECO anticipates the scope of the GIS project to consist of migrating data from multiple source systems into the GIS database, interfacing with the existing land base facilities tool to geographically display assets and implementation of a web based viewing product to support corporate wide visualization and analysis.

The Request for Proposal (RFP) for the Enterprise GIS was issued to four vendors by the end of July 2009 with three of four vendors responding with proposals. As of the conclusion of our fieldwork in mid-December 2009, PECO had identified a preferred vendor and was in the process of presenting this recommendation to senior management for approval. PECO plans to complete a final Business Case with refined cost estimates provided by the selected vendor. A final contract award is contingent upon a final business case review and approval. Upon such approval, the Company will meet with the selected vendor to determine the feasibility of deploying the Enterprise GIS throughout the organization.

Staff's Follow-up Recommendation – **Complete a final Business Case encompassing the overall Information Technology strategy and upon approval, select a vendor and implement the Enterprise GIS to visually portray the results of PECO's electric reliability program, as appropriate.**

Prior Recommendation – Report on steps taken to address the slightly unfavorable trends recently experienced in outage causes.

Prior Situation – PECO had experienced unfavorable trends in certain outage factors in 2006 which was a year of extraordinary storm activity. The two largest causes of outages were equipment failure and vegetation (or tree related). Although the Company had taken steps to address the factors affecting these trends, it was too early to determine if they would reverse these trends.

PECO implemented a cutout replacement program in 2006 during which cutouts were replaced on all three phases at 117 locations for a total of 351 cutout replacements from January through May 2006. Moreover, PECO budgeted an additional $1 million in the fourth quarter of 2006 directed at tree trimming and tree removal on 21 circuits, primarily in Chester County.

Follow-up Finding and Conclusion No. 14 – **PECO has implemented programs to address the unfavorable system trends in both equipment and tree-related outages; however, additional resources have not been allocated to those operating regions and/or counties with elevated tree related outage levels.**

PECO's system-wide equipment failure and vegetation related outages from 2005 to 2009 are presented in Exhibit VIII-1. Outages due to equipment failure and vegetation have decreased by 424 and 1,469, respectively, since 2006 but are still well above 2005 levels. The 2006 cutout replacement project has helped reduce some of the equipment related outages which is evident in the 23% decrease shown in Exhibit VIII-2.

Exhibit VIII-1
PECO Energy
System wide Number of Outages by Cause
2005-2009

	2005	2006	2007	2008	2009*
Equipment Failure	4,143	4,770	4,319	4,368	4,346
Vegetation	3,077	4,780	3,313	3,683	3,311

Source: Response to Data Request EG-2
* annualized based on January through August data

Exhibit VIII-2
PECO Energy
Cutout Related Outages
2005-2009

	2005	2006	2007	2008	2009*	% Change
Cutout related outages	559	611	617	575	430	-23%

Source: Response to Data Request EG-34
* annualized based on January through October data

In order to reduce vegetation related outages, PECO augmented its Distribution Preventative Maintenance (DPM) five year tree trimming cycle with a 34kV program in 2006 and a Mid-cycle program in 2007. Under these two programs, PECO trims the circuits experiencing adverse tree related outages on an exception basis. The 34kV program is mainly focused on removing trees under the circuits while the herbicide program treats other areas with herbicides. The 34 kV program and the herbicide program have different goals and schedules. The 34 kV program targets approximately 40 circuits each year for additional trimming of fast growth vegetation, deadwood, and overhangs. The herbicide program, which employs a 3-year cycle, targets one third of the distribution service territory each year. The 34kV program was initiated in Chester County during 2006 and expanded to the entire system in 2007. PECO includes circuits in the 34kV program that exceed established vegetation interruption threshold levels based on variables such as number of customer interruptions, number of customer interruption hours, and vegetation related system average interruption frequency index (SAIFI) and system average interruption duration index (SAIDI). A circuit is excluded from the 34kV program if it had program trimming performed the previous year, is scheduled for DPM program trimming in the current year or is part of the current year's Mid-cycle program. The Mid-cycle program includes all qualifying circuits that are in the third year of the five year DPM cycle. The purpose of the Mid-cycle program is to provide an interim step within the five year DPM cycle in order to minimize tree-growth by fast growing and non-compatible trees.

Although PECO successfully reduced its overall tree related outages from 2006 levels, the Audit Staff believes that allocation of funding should be targeted to those operating regions and/or counties that experience the most vegetation related outages. As illustrated in Exhibit VIII-3, Chester and Delaware counties have consistently experienced higher than average vegetation related outages. The percentage column in Exhibit VIII-3 shows the percentage of Chester and Delaware vegetation related outages to the system-wide vegetation related outages. As can be seen in Exhibit VIII-3, the vegetation related outages in Chester and Delaware Counties have consistently been over 50% of total vegetation outages. Although Audit Staff recognizes that 2006 was a year of extraordinary storm activity, tree related outage levels still remain above pre-2006 levels for both Chester and Delaware counties.

The Audit Staff believes that a correlation between the increase in vegetation related outages and the reduction in vegetation expenditures in these two counties is evident as shown in Exhibits VIII-4 and VIII-5. As evident from Exhibit VIII-4, annualized vegetation expenditures for Chester County in 2009 are less than half of what was spent in 2008 and Delaware County expenditures shown in Exhibit VIII-5 decreased by over 75% from 2005 to 2008. Additionally, Chester County vegetation expenditures as a percentage of system-wide vegetation expenditures decreased from 25% in 2006 to approximately 11% in 2009. Furthermore, vegetation expenditures for the DelChester (Delaware and Chester Counties combined) region as a percentage of system-wide vegetation expenditures dropped from 38% in 2006 to approximately 26% in 2009.

Exhibit VIII-3
PECO Energy
Vegetation Related Outages for Chester and Delaware Counties As a Percentage of All Counties Served
2005-2009

	2005	%	2006	%	2007	%	2008	%	2009*	%
Chester	909	30%	1,464	31%	945	28%	1,018	28%	1,059	32%
Delaware	783	25%	1,211	25%	819	25%	950	26%	834	25%
Totals	**1,692**	**55%**	**2,675**	**56%**	**1,764**	**53%**	**1,968**	**54%**	**1,893**	**57%**

Source: Response to Data Request EG-40
* annualized based on January through August data

Exhibit VIII-4
PECO Energy
Chester County Vegetation Expenditures
2005-2009

	2005	2006	2007	2008	2009*
34kV program	$0	$821,310	$803,137	$604,674	$577,706
Hazardous Removal Program	$106,833	$364,295	$510,236	$435,749	$264,659
Herbicide cut and spray program	$280,071	$344,095	$105,958	$343,012	$626,582
Mid-cycle program	$0	$0	$269,273	$598,017	$915,285
Routine lift trimming	$1,699,782	$2,737,194	$1,991,268	$3,238,325	$957,579
Routine manual trimming	$713,575	$2,739,530	$837,989	$2,003,567	$340,208
Strategic removal program	$7,074	$267,849	$604,115	$303,258	$48,032
Grand Totals	**$2,807,335**	**$7,274,273**	**$5,121,976**	**$7,526,602**	**$3,730,049**

Source: Response to Data Request EG-50
* annualized based on January through August data

Exhibit VIII-5
PECO Energy
Delaware County Vegetation Expenditures
2005-2009

	2005	2006	2007	2008	2009*
34kV program	$0	$0	$14,402	$205,493	$267,453
Hazardous Removal Program	$35,781	$77,500	$106,500	$76,756	$284,703
Herbicide cut and spray program	$77,810	$105,362	$115,491	$198,962	$34,173
Mid-cycle program	$0	$0	$218,269	$464,030	$273,387
Routine lift trimming	$2,662,497	$1,972,707	$2,105,469	$275,192	$1,765,836
Routine manual trimming	$3,224,725	$1,522,143	$980,645	$211,340	$2,255,661
Strategic removal program	$114,849	$61,097	$47,754	$23,710	$15,756
Grand Totals	**$6,115,662**	**$3,738,809**	**$3,588,530**	**$1,455,483**	**$4,896,969**

Source: Response to Data Request EG-50
* annualized based on January through August data

The Audit Staff believes that although the 34kV and Mid-cycle programs are beneficial PECO should allocate appropriate vegetation funding to those counties/regions that experience the most vegetation related outages.

Staff's Follow-up Recommendation –**Allocate vegetation management funding levels among operating regions and the 34kV, herbicide, Hazardous Removal and mid Cycle programs to target areas experiencing elevated tree related outages relative to the other operating regions to mitigate tree related outages.**

Prior Recommendation – Increase vegetation management (VM) funding 10% to 20% over 2005 levels to address the increase in the number of tree-related interruptions.

Prior Situation – PECO's history of tree-related outages showed an increasing trend in the number of incidents. Consequently, the consultant concluded that PECO's vegetation management funding needed to be increased.

The number of vegetation related outages increased from approximately 2,800 per year during the 2001 to 2004 timeframe to approximately 3,100 in 2005 and 4,700 in 2006. Therefore, increased funding for an extension of present maintenance practices or new initiatives that were focused on addressing the increasing number of tree incidents was justified.

Follow-up Finding and Conclusion No. 15 – **PECO has increased its overall vegetation management funding over 2005 levels and plans to maintain higher funding levels through 2012.**

PECO's system-wide vegetation management expenditures increased by approximately 23% from 2005 to 2009. Exhibit VIII-6 shows system-wide vegetation management funding and the percentage of changes since 2005 as well as previous year over year changes. Although system-wide vegetation management expenditures dropped slightly from 2007 to 2008, they increased by over 10% from 2008 to 2009. Moreover, PECO has budgeted overall VM expenditures at increasingly elevated levels over the next several years with $39.1 million targeted for 2012 which represents a 71% increase over 2002 VM expenditures and a 47% increase over 2005 VM expenditures.

Exhibit VIII-6
PECO Energy
System-wide Vegetation Management Expenditures (Actual)
2005-2009
($ Millions)

	2005	2006	2007	2008	2009
Vegetation Management	$26.7	$29.0	$33.5	$29.9	$32.9*
Percent change since 2005		8.6%	25.7%	12.2%	23.4%
Percent change over previous year		8.6%	15.8%	-10.8%	10.1%

Source: Response to Data Request EG-9 and auditor analysis.
* annualized based on January through September data

By increasing its vegetation management expenditures, system-wide vegetation related outages decreased by 1,469 from 2006 to 2009. While successful at reducing overall vegetation related outages, geographic pockets with PECO's service territory have experienced elevated tree related outage levels (see Finding and Conclusion No. 2). By conservatively assuming that 20% to 30% of the decrease was prevented by increased VM funding, PECO managed to avoid approximately 294 to 440 vegetation related outages.

Staff's Follow-up Recommendation – **None.**

Prior Recommendation – Reduce the need for corrective maintenance expenditures.

Prior Situation – From 2001 to 2005, PECO's vegetation management corrective maintenance (or hot spotting) expenditures ranged from 8% to 16% of total pruning costs. Hot spotting is unplanned vegetation clearance work billed on a time and material basis. Consequently, hot spotting is generally considered to be inefficient as it costs approximately 30% more per unit of work than preventive (or planned) maintenance. As it is not cost effective to eliminate all hot spotting, industry best practices suggest restricting hot spotting to less than 15% of total pruning costs with the 5-10% range providing a good balance between reliability and costs. The consultant estimated that if PECO were to reduce corrective maintenance to 5% of total pruning costs, a net potential savings of approximately $225,000 could be realized.

Follow-up Finding and Conclusion No. 16 – **PECO has reduced the need for corrective maintenance to approximately 8% of total pruning costs over the 2005 to 2009 timeframe.**

PECO's hot spotting expenditures as a percentage of actual VM expenditures for 2005 until September 2009 are presented in Exhibit VIII-7. Over the 2005 to 2009 timeframe, PECO's hot spotting expenditures fluctuated from year to year but were maintained within a fairly consistent range of between 7.6%-9.1%. PECO realized a

reduction of over $450,000, or approximately $112,000 annually, in corrective maintenance expenditures between 2006 and October 2009 as compared to the corrective maintenance expenditures in 2005. Aside from emergent work, these expenditures also include responses to customer requests. PECO currently averages between 300 and 500 customer requests each month for vegetation related issues. Each request must be reviewed, surveyed, assessed and scheduled for work if needed. The number of customer requests received and resulting work (sometimes outside of the normal scope) drives some of these expenditures.

Exhibit VIII-7
PECO Energy
Hot-spotting Percentages
2005-2009

	2005	2006	2007	2008	2009*
% Hot-spotting	9.1%	7.6%	8%	7.7%	8.8%

Source: Response to Data Request EG-9
* annualized based on January through September data

Although PECO has not managed to reduce it's hot-spotting to 5% of total pruning costs as proposed in the Management Audit, it has achieved a reduction of approximately 3% from the 2001-2005 average of 11% to an average of 8% for 2005-2009. By achieving this reduction, PECO has ensured that its hot-spotting expenditures as a percentage of total pruning are within Utility Vegetation Management industry recommendations and provide a good balance between reliability and costs.

Staff's Recommendation – **None.**

Prior Recommendation – Shift and prioritize the focus of the proposed mid-cycle and 34kV programs to actions that have the most impact on customer minutes of interruptions.

Prior Situation – The consultant assessed that PECO's focus for its mid-cycle and 34kV programs failed to optimize the reliability benefits of the programs by maintaining an emphasis on pruning clearances rather than locating emerging hazard trees. The consultant believed that the Company should shift its focus from reducing in-growth outages to reducing outages due to tree failures as part of the core objectives of the programs. As tree failures commonly damage Company facilities as opposed to in-growth outages, reductions in the number of tree failure outages would have a greater impact on reliability. Furthermore, the focus for reducing tree risk should be directed to the lines or line sections that have the greatest customer impact when an interruption does occur.

<u>Follow-up Finding and Conclusion No. 17</u> – PECO has directed the focus of the mid-cycle and 34kV programs to circuits that have the most impact on customer interruptions; however, additional improvement opportunities have been identified.

The Company's vegetation management (VM) department works with Reliability Engineering (RE) to produce outage reports for vegetation related interruptions including in-growth, broken limbs, uprooted trees and vines. Circuits are then ranked based on how poorly they are performing. Fast-growing, non-compatible trees are trimmed or removed. In areas with significant overhang, additional clearance is targeted on weak-wooded species.

Based upon under-performing circuits that had significant storm impacts, the original $1 million allocated for the 34kV program shown in Exhibit VIII-8 was targeted at areas within Chester County. Subsequently PECO VM and RE built a business case to increase the funding and the scope of both programs to approximately $3 million.

Exhibit VIII-8
PECO Energy
34kV and Mid-cycle Program Expenditures
($ Thousands)
2006-2009

	2006	2007	2008	2009*
Mid-Cycle	$0	$1,410	$2,016	$2,117
34kV	$985	$1,683	$884	$985
Totals	**$985**	**$3,093**	**$2,900**	**$3,102**

Source: Response to Data Request EG-37
* annualized based on January through October data

From 2006 till August 2009, under the 34kV and Mid-cycle Programs, 420 hazard trees were removed, 1,138 tree locations requiring additional clearance were identified and 34 tree locations received ground-to-sky[1] clearance. The 2010 through 2012 proposed budget for these two programs is shown in Exhibit VIII-9.

[1] Ground-to-sky clearance is when all branches, limbs etc. on the side of the conductor are removed from the base of the tree to the tip of the tree.

Exhibit VIII-9
PECO Energy
34kV and Mid-cycle Proposed Budget
($ Thousands)
2010-2012

	2010	2011	2012
Mid-Cycle	$2,646	$2,718	$2,799
34kV	$1,280	$1,315	$1,355
Totals	$3,926	$4,033	$4,154

Source: Response to Data Request EG-11

To supplement the 34kV and mid-cycle programs, PECO maintains a Hazardous Tree Removal Program (HTP) which targets trees that are dead, deteriorating or diseased and which have a high probability of impacting facilities either by shedding branches or falling over. In addition, PECO has a Strategic Tree Removal Program (STP) which targets trees that are in their infancy but will become incompatible with surrounding electrical facilities. These trees are removed and maintained with herbicides. PECO does not expect the STP to have an immediate impact on its reliability, but considering the sheer number of trees that are addressed and removed the Company projects a decrease in the number of in-growth events in the long run. From 2005 through 2009, tree removals under the HTP increased by approximately 400% while under the STP tree removals increased from 346 in 2005 to 18,212 in 2009. From 2005 to 2009, PECO had removed a total of 39,571 trees under these programs.

Although these two programs have emphasized a greater focus on tree removals, it appears that further gains could be achieved if more ground-to-sky pruning is strategically implemented. Moreover, the Company concluded as part of a vegetation management reliability assessment, performed in the third quarter of 2009, that reliability improvements could be achieved by incorporating strategic ground to sky tree trimming as part of the Mid-cycle and 34kV programs. Ground-to-sky trimming prevents the intrusion of branches into the right-of-way hence decreasing the possibility of overhangs. Consequently, ground-to-sky trimming implemented on a strategic basis would offer opportunities to enhance reliability for trouble prone circuits.

Staff's Recommendation – **Determine the feasibility of augmenting the tree trimming criteria for the selected circuits under the 34kV and mid-cycle programs to include more ground-to-sky trimming where strategically appropriate and feasible considering the public ramifications.**

Prior Recommendation – Take corrective actions to further reduce gas line hits.

Prior Situation – For the period 2002 to 2005, the total number of line hits as a percentage of locate tickets was less than 1%. From 2002 through 2006, despite an increase in the number of tickets and an increase in the number of line hits, the total hits as a percentage of locate tickets continued to decrease. However, during this four year period, PECO "at fault" hits accounted for approximately 61% of the line hits with inaccurate prints (i.e., facilities mapping) attributing to a significant portion of the hits. PECO's responsibility for damage to its own facilities during this four year period was estimated to be about $1.5 million.

Follow-up Finding and Conclusion No. 18 – **PECO has taken actions to reduce gas line hits but further reductions could be achieved.**

In an effort to promote underground facility awareness and reduce future damages to its underground gas facilities, PECO conducted several initiatives during 2008 and 2009. PECO held "Safety Day" events in 2008 (192 attendees) and in 2009 (193 attendees) co-sponsored with the Pennsylvania Public Utility Commission (PUC) and Pennsylvania One Call. PECO also conducted quarterly meetings with Verizon Pennsylvania, Inc. (Verizon) and its sub-contractors throughout 2008 and 2009 to discuss safe excavation practices around PECO facilities as Verizon deployed it Fiber Optic Service (FiOS) facilities. PECO also held meetings with Aqua Pennsylvania, Inc. and Pennsylvania American Water Company to reinforce Dig Safe procedures. PECO participated in a Contractor Safety Awareness Program in October 2009 supported by Pennsylvania One Call. Other activities included distribution of contact cards to contractors, excavators, and homeowners by PECO inspectors. In addition, PECO distributed semi-annual bill stuffers to homeowners regarding damage prevention awareness (i.e., call before digging).

PECO's damage prevention statistics (i.e., number of gas locate tickets and gas line hit damages) from 2006 through 2009 are shown in Exhibit VIII-10. Line hits as a percentage of tickets handled decreased from 0.41% in 2006 to 0.36% in 2009.

Exhibit VIII-10
PECO Energy
Damage Prevention Statistics
2005-2009

	2006	2007	2008	2009*
Gas Locate Tickets Handled	174,055	192,339	171,269	157,459
% Change from prior year	5.2%	10.5%	-11.0%	-8.1%
No. of Gas Line Hits	709	732	588	568
% Change from prior year	-22.4%	3.2%	-19.7%	-3.5%
% of Line Hits to tickets handled	0.41%	0.38%	0.34%	0.36%

Source: Response to Data Request EG-17 and EG-39
*annualized based on January through October data

Exhibit VIII-11 lists the causal factors and frequency attributed to the reported line hits to PECO facilities from 2005 through October 2009. Since 2006, the number of line hits have decreased overall by 19.9%. Causal factors related to hits by Contractors and PECO decreased by 33.1% and 9.9% respectively; however, line hits attributed to "inaccurate prints" and "no print" causal factors increased by 52.5% and 20% respectively. Moreover, PECO's at-fault hits still account for approximately 62% of total damages.

Exhibit VIII-11
PECO Energy
Damage Causes
2005-2009

	2006	2007	2008	2009*	Total	% Change	% of Total
No Locate Request	125	102	59	55	341	-55.8%	13.1%
Expired Locate Ticket	17	11	20	11	59	-36.5%	2.3%
Dug Early	8	7	5	4	24	-55.0%	0.9%
Marked Accurately	143	131	119	127	520	-11.0%	20.0%
Out of Extent	3	9	8	2	22	-20.0%	0.9%
Poor Work Practice	9	10	3	5	27	-46.7%	1.0%
Contractor At Fault	**305**	**270**	**214**	**204**	**993**	**-33.1%**	**38.2%**
Failed to Mark	47	53	43	28	171	-41.3%	6.6%
Mis-Marked	67	66	46	44	223	-33.7%	8.6%
No-Show	6	5	1	4	16	-40.0%	0.6%
Other	62	62	24	7	155	-88.4%	5.9%
Inaccurate Prints	159	226	212	242	839	52.5%	32.3%
No Print	8	13	8	10	39	20.0%	1.5%
Installation Practices	28	16	15	10	69	-65.7%	2.6%
Shallow Facilities	24	21	23	18	86	-25.0%	3.3%
Tracer Wire	3	0	2	1	6	-60.0%	0.2%
PECO At Fault	**404**	**462**	**374**	**364**	**1604**	**-9.9%**	**61.7%**
Total	**709**	**732**	**588**	**568**	**2597**	**-19.9%**	**100.0%**

Source: Response to Data request EG-39
* annualized based on January through October data

The Company's management stated that most damages due to "inaccurate prints" are caused by mapping errors which are continuously improved by making corrections any time they are discovered. PECO also has a documented "discrepancy identification process" which outlines the procedure for notifying the Mapping and Document Services Department of any discrepancies that exist between actual field conditions and current maps. Moreover, PECO has continued to research new technology designed to assist in locating plastic mains and services. In 2009, PECO purchased an acoustic locating tool which should significantly help locate plastic mains that do not have tracer wire.

From 2006 to 2009, the volume of damages decreased from 709 to 568. However, the damages due to "inaccurate prints" as a percentage of total hits increased considerably from 22% in 2006 to almost 43% in 2009. For the four year period, 2006 to 2009, 32% of overall hits were caused due to inaccurate prints and 62% of hits were the responsibility of PECO and its contracted Locators. PECO billed external contractors and its locate contractors over $2.5 million from 2006 to 2009 and collected a large portion of that amount. Hence, PECO's responsibility for damage to its own facilities are estimated at approximately $2.1 million ($2.5M x 46/54 = $2.1M). Additionally, if PECO would have been able to reduce the number of damages due to "inaccurate prints" by approximately 20%, this would have resulted in a reduction of 50 damages thereby decreasing the total damages to approximately 520. Estimating each damage incident to cost approximately $1,000 on average, PECO could potentially save approximately $50,000 in damages. Also, safety is a major aspect of gas distribution utilities. Line hits result in safety issues for the customers and the Company's employees and contractors. By reducing the number of line hits due to inaccurate and no prints, PECO would significantly mitigate its safety risks accordingly.

Staff's Recommendation – **Strive to reduce the number of PECO "at-fault" line hits attributable to inaccurate and no print causal factors.**

Prior Recommendation – Enhance the ability to visually portray the gas pipe network, surrounding environmental data, pipe leaks and replacement projects on geographic maps.

Prior Situation – PECO utilized several applications to track and maintain over six thousand miles of gas main in its service territory. These applications included:

- Optimain – a decision support application that provides a knowledge-based framework used to evaluate and rank pipes system-wide against a range of specified conditions and factors.
- Advantica SynerGee Software – a program used to simulate and model flows of natural gas in distribution and transmission piping systems.
- MapInfo Application – a Windows-based mapping program that enabled the user to visualize relationships between facility data onto maps and to specify distances between created points on the map.

- Leak Tracking Database – a historical database of information collected on the gas leaks that have been reported and/or repaired in the PECO gas distribution network.

Furthermore, PECO utilized its own unique X/Y coordinate system to map and visually portray its facilities rather than mapping its facilities based on universally recognized longitude and latitude coordinates commonly used by GIS systems which was resulting in a measure of inaccuracy.

As part of a congressional and federal initiative, the Pipeline Safety Act of 2006 would soon require utility distribution systems to "know its infrastructure, identify threats, and assess and prioritize risks" as part of a Distribution Integrity Management Program (DIMP). In response to these regulations, other gas utilities had begun to invest in real world based GIS systems to support management of their distribution systems.

The consultant felt that it was unclear if PECO, with its gas mapping records and capabilities, would be able to adequately support the DIMP and that transition to a real world based GIS would greatly enhance its knowledge of its pipe infrastructure and surrounding environmental risk factors (e.g., hospitals, schools, other underground utility infrastructure, etc.).

<u>Follow-up Finding and Conclusion No. 19</u> – PECO has enhanced the ability to visually portray the gas pipe network and is in the process of implementing an Enterprise GIS system that will further enhance its ability to geographically display data collected in the field.

As of late 2009, PECO was using MicroStation as the platform for gas design and mapping. PECO is also using MapInfo for various GIS applications which is populated via an interface from the SynerGee application that is used to model and maintain a sub-set of PECO's distribution and transmission system. In early 2009, PECO deployed the Optimain ArcGIS or GIS Lite interface which allows gas personnel to view pipe maintenance history against main pipe segments on electronic maps. As part of the ArcGIS deployment, 67,000 main leak and pipe inspection records were Geocoded and associated with the best matching gas main segment. Over 89% of main leak records and over 41% of inspection records were successfully associated with a main segment. PECO has also converted its internal X/Y coordinate system to align with state plane coordinates resulting in more precise mapping.

In order to reap benefits from these initial steps, the Company has selected a vendor that will provide an Enterprise GIS system for the Company's electric and gas operations. PECO plans to replace MapInfo capabilities with those of the new Enterprise GIS system and to migrate the facilities currently modeled in MapInfo to an "industry standard" gas model and to expand the model in future stages of the GIS deployment. PECO's current asset repository (Passport) includes gas and electric distribution facilities data hence the overall Information Technology (IT)strategy needs to be taken into consideration as part of its Business Case justification process in order to properly interface the two systems via implementation of the Enterprise GIS system thus enabling process improvement through the elimination of redundant data entry and

improved inter-system data integrity. Moreover, PECO plans to interface the Enterprise GIS with its existing applications to geographically display regulatory assets. Pennsylvania state plane coordinates will be provided for each asset. Additionally, PECO's mains, valves, regulator stations, etc. will be migrated to the Enterprise GIS and maintained by a GIS group. The Enterprise GIS system will also be a repository for township and state construction data that can be referenced while working in Optimain. The two areas that PECO is looking to benefit greatly with the implementation of the Enterprise GIS is mapping gas service data to county parcels and collection of GPS data gathered in the field.

Staff's Recommendation – **Complete a final Business Case encompassing PECO's overall IT strategy and upon approval, select a vendor and implement the Enterprise GIS system, as appropriate, to further enhance the ability to geographically display the gas pipe network.**

IX. EMERGENCY RESPONSE RESOURCE STRATEGY

Background – The focused management and operations audit (MA) of PECO Energy (PECO or the Company) conducted by Schumaker & Company was issued in August 2007, at D-05MGT048, contained two recommendations regarding the Emergency Response Resource Strategy area. In this chapter, one prior recommendation and prior situation is reviewed and one follow-up finding and one recommendation is presented.

Prior Recommendation – Continue the analysis presented in the Emergency Response Resource Strategy chapter to measure the management of the dispatch queue time as one of several possible indicators of the effectiveness of the emergency response resource strategy.

Prior Situation – As part of the MA, a joint project team was created consisting of Schumaker & Company consultants and designated PECO representatives to conduct an in-depth review of PECO's emergency response resource strategy. This review was performed to determine appropriate resource requirements for the Company to respond to storm outages (both PUC reportable and non-reportable).

The consultant believed that PECO should determine the best way to perform the dispatch queue time analysis such that the data provides the most meaningful insight into dispatch performance. It was also recommended that PECO leverage the newly developed Mobile Dispatch System to ensure that valuable information is collected so that it can be further analyzed to evaluate dispatch and outage response performance. Furthermore, the Company should capture the information needed to perform a timeline analysis of various outages per day scenarios to determine the adequacy of emergency response resource levels.

Follow-up Finding and Conclusion No. 20 – **PECO has completed implementation of the Mobile Dispatch System and has begun using the new system to collect historical information but has not performed a detailed dispatch queue analysis.**

The Mobile Dispatch Project (MDP), used to develop and implement the Mobile Dispatch System (MDS), was initiated in October 2006. During the first nine months of the MDP, the MDS was designed and built by a project team. Subsequently, from September 2008 through October 2009, the MDS was implemented in three phases. During Phase I, the MDS was implemented in Distribution System Operations (DSO) over the September 2008 to November 2008 timeframe. Phase II was implemented in Transmission & Substation/Construction & Maintenance (T&S/C&M) from April 2009 to June 2009. Lastly, as part of the Phase III, the MDS was implemented in Field & Meter Services from August 2009 to October 2009. As part of the overall project, mobile data terminals (MDTs) were installed in approximately 600 PECO vehicles. The mobile dispatch fleet consists of 277 trucks, 257 pick-up trucks, 37 sport utility vehicles, and 33 vans.

The MDS facilitates automated crew allocation and scheduling, order sequencing, dispatching and tracking of various items such as trouble tickets, outage

repair, and maintenance work for DSO, etc. The MDS uses GPS receiver data provided by field devices to continuously identify crew locations on electronic maps in the dispatch consoles and MDTs. The MDS also interfaces with other applications such as the Outage Management System (OMS), Passport (PECO's work management system), and the Customer Information Management System (CIMS). The OMS is used to identify outage events and transmit this information into the MDS, which in turn, adds markers to each of these jobs that enters the system defined as the "job status" field. There are several job status types in the MDS, such as: create, power off, pending, dispatched, accepted, enroute, onsite, cleared, reporting, dispose and power on. As of late 2009, PECO was exploring opportunities for utilizing the mobile dispatch information in a new web-based reporting tool. Although this web-based tool was in the early assessment phase it provides an opportunity for greater leverage and flexibility in analyzing information in various formats. Expenditures and realized annual savings for the MDP are highlighted in Exhibit IX-1 and Exhibit IX-2 respectively.

Exhibit IX-1
PECO Energy
Mobile Dispatch Project Expenditures
October 2006 - October 2009

	Actual
	$
InformationTechnology (IT) Software, Hardware, Labor	16,150,884
IT Expense	1,227,124
IT Total	17,378,007
Business Unit Labor Capital	1,268,665
Business Unit Labor Expense	382,787
Training	1,613,687
Business Unit Total	3,265,139
Project Total	20,643,146

Source: Response to Data Request ER-7

Exhibit IX-2
PECO Energy
Mobile Dispatch Project Estimated Realized Annual Savings (By Organization)
As of December 2009

	Annual Savings
	$
Distribution System Operations	
Overtime	605,000
Other Operational Savings	977,000
Construction &Maintenance	
Overtime	272,000
Other Operational Savings	515,000
Transmission &Substation	
Other Operations Savings	76,000
Customer Operations	
Other Operational Savings	151,000
Corporate	
Storm Management	2,270,000
Contractors	1,308,000
Other Operational Savings	299,000
Total Annual Savings	6,473,000

Source: Response to Data Request ER-7

PECO has started using the MDS to determine the dispatch queue time, dispatch travel time, repair time, etc. for each of the respective organizations. The MDS determines these times by calculating the intervals between the various "job status" fields. For example, dispatch queue time is the time interval between the "power off" status and the "dispatched" status and the dispatch travel time is the time interval between the "dispatched" status and the "onsite" status. As PECO matures in the use of the MDS (see Chapter X, GIS Mapping-Finding and Conclusion No. 22, for further discussion) collection and analysis of this data will enable management to make strategic and tactical decisions to improve future overall storm response performance and customer service.

Mobile Dispatch is used by many utilities across Pennsylvania and by implementing the MDS, PECO has enhanced its ability to manage real-time dispatching from receipt/creation of an order through the final closure of the work. The MDS also helps field personnel view daily work tickets including passport work orders, outage orders as well as access safety procedures. By implementing the MDS, PECO has

taken proactive steps to reduce customer average interruption duration index (CAIDI) minutes, improve customer satisfaction and reduce operational costs such as cell phone usage, fuel, vehicle maintenance and map printing.

<u>Staff's Follow-up Recommendation</u> – **Perform analysis of the dispatch queue times as historical information is gathered, document the results, and make resource allocation changes as appropriate.**

X. GIS MAPPING

Background – The focused management and operations audit of PECO Energy (PECO or the Company) conducted by Schumaker & Company was issued in August 2007, at D-05MGT048, contained two recommendations regarding the geographic information system (GIS) Mapping area. In this chapter, two prior recommendations and prior situations are reviewed and two follow-up findings and two recommendations are presented.

Prior Recommendation – Complete a more detailed assessment and cost benefit analysis, based on results of the request for quotation (RFQ), to evaluate a phased program approach to implementing an Enterprise GIS system for PECO.

Prior Situation – PECO was using several different technologies for managing its physical infrastructure and presenting information visually and had made several attempts to integrate these technologies; however, these efforts had not yet resulted in an integrated platform or an Enterprise GIS that used the most recent technological advances available with GIS mapping technologies. Additionally, PECO's mapping system was based on its own unique internal X/Y coordinate system which could not be easily integrated with other geographic information sources (i.e., universally recognized latitude and longitude or other standard projection coordinates). One of the benefits of an Enterprise GIS system is reduced mapping costs in terms of both resources and personnel. The consultant estimated that PECO could achieve annual savings ranging from $480,000 to $960,000 by reducing its requirements to dispatch all locate requests (i.e., eliminate dispatching costs related to locates where no PECO facilities exist) by 10 to 20%.

Follow-up Finding and Conclusion No. 21 – **PECO has performed a preliminary cost/benefit analysis and has taken steps to select a vendor for implementing an Enterprise GIS system.**

PECO issued a Request for Information (RFI) for GIS products and services to four GIS vendors in April 2008. Based on the information gathered from other utilities and from prospective vendors, PECO's project team developed a business case (i.e., cost benefit analysis) to clearly identify the benefits and further justify proceeding with the implementation of an Enterprise GIS. The business case revealed numerous quantifiable and qualitative benefits with net benefits ranging from $12 to $15 million through 2018.

Consequently, in July 2009, a Request for Proposal (RFP) was issued to potential vendors. PECO received proposals in late August and completed initial scoring of vendor proposals in September 2009. As of the Audit Staff's last day of field work (i.e., December 16, 2009) PECO's project team had narrowed the number of vendors, identified a preferred vendor, and was in the process of presenting their recommendations to senior management. PECO anticipated completion of a final business case and presentation for its Project Review Committee and Project Authorization Review Committee by the end of December 2009. A projected date for

awarding the final contract had not been determined as of the Audit Staff's last day of field work.

Staff's Follow-up Recommendation – **Complete evaluation of the benefits of implementing an Enterprise GIS system and establish a timeframe, as appropriate, for deployment.**

Prior Recommendation – Document and report on the results (i.e., successes, challenges, and benefit realization) of the Mobile Dispatch Project following implementation at PECO in 2009.

Prior Situation – At the time of the management audit, PECO was in the process of designing, configuring and implementing a Mobile Dispatch System (MDS) which would enable field crews to have access to equipment and network information from virtually any location, based on wireless connectivity. The field crews would also be dispatched via the wireless capability thus reducing the need to perform radio dispatching. The MDS would also have auto-dispatch capability for both emergent work and scheduled work and would be integrated with PECO's Outage Management System (OMS).

The mobile computers in the trucks would, in addition to showing a device outage, be able to display trouble tickets and details of the work orders. Moreover, the vehicles would be equipped with a Geographic Positioning System (GPS) transmitter that would allow the display of their location on a map enabling dispatchers to more efficiently route trucks and crews. The system would also provide the capability to provide historical data on the travel of a mobile unit which could be used in post response reviews. Field technicians would also have the ability to make changes to electronic system maps if any inaccuracies are identified onsite. For the reasons cited, the consultants had reasonable expectations that the MDS would result in reduced operating costs and improved levels of customer service.

Follow-up Finding and Conclusion No. 22 – **Although PECO has fully implemented the Mobile Dispatch System, a final project evaluation (i.e., system performance, change management issues, and business project changes, etc.) will not be completed until the fourth quarter of 2010.**

The MDS is a Mobile Workforce Management System that combines integrated computer software and Mobile Data Terminals (MDTs) installed in field vehicles to create greater operational efficiencies. As discussed in Chapter-IX, Emergency Response Resource Strategy (Finding and Conclusion No. 20), PECO has completed all three phases of the implementation process. Phase I included initial deployment and training for Distribution System Operations (DSO), Phase II included deployment and training for Transmission & Substation/Construction & Maintenance, and Phase III included deployment and training within the Field and Meter Services and DSO Energy Technicians Group. The Mobile Dispatch Project was implemented more efficiently and under budget, by approximately $3.5 million, primarily due to the resolution of

OMS/Computer-Aided Design (CAD) interface issues, better alignment of resources and more efficient employee training.

Although PECO performed several formal and informal reviews and lessons learned during the three project implementation phases, the focus was limited only to technical system performance and user acceptance. As Phase III implementation was completed as recently as October 2009, a final project evaluation had not been performed. However, management stated that a final project evaluation would be completed in the second quarter of 2010.

Staff's Follow-up Recommendation – **Document lessons learned (i.e., successes and challenges) from the Mobile Dispatch System implementation and perform a final project evaluation to provide feedback on system performance, business process changes and change management issues to facilitate a better understanding of any limitations.**

XI. EMERGENCY PREPAREDNESS

Background - In order to protect the Commonwealth's infrastructure and ensure safe, continuous and reliable utility service, effective June 2005, PUC regulations at 52 Pa. Code § 101 (Chapter 101) required all jurisdictional utilities to develop and maintain written physical security, cyber security, emergency response and business continuity plans. Furthermore, in accordance with 52 Pa. Code § 101.1, all jurisdictional utilities are to annually submit a Self Certification Form to the Commission documenting compliance with Chapter 101. This form is comprised of 13 questions as shown in Exhibit XI-1:

Exhibit XI-1
Public Utility Security Planning and Readiness Self Certification Form

Item No.	Classification	Response (Yes – No –N/A*)
1	Does your company have a physical security plan?	
2	Has your physical security plan been reviewed and updated in the past year?	
3	Is your physical security plan tested annually?	
4	Does your company have a cyber security plan?	
5	Has your cyber security plan been reviewed and updated in the past year?	
6	Is your cyber security plan tested annually?	
7	Has your company performed a vulnerability or risk assessment analysis as it relates to physical and/or cyber security? If so, when?	
8	Does your company have an emergency response plan?	
9	Has your emergency response plan been reviewed and updated in the past year?	
10	Is your emergency response plan tested annually?	
11	Does your company have a business continuity plan?	
12	Has your business continuity plan been reviewed and updated in the past year?	
13	Is your business continuity plan tested annually?	

* Brief explanation needed if supplied as a response
Source: Public Utility Security Planning and Readiness Self Certification Form,
Docket No. M-00031717F0006/L-00040166

The Audit Staff reviewed the most recent Self Certification Form submitted by the Company to determine the status of its responses. Our examination of the Company's emergency preparedness included a review of the physical security plan, cyber security plan, emergency response plan, business continuity plan, and all associated security measures. Due to the sensitive nature of the information that was reviewed, specific information is not revealed but rather the generalities of the information reviewed are summarized.

<u>Finding and Conclusion No. 23</u> – PECO Energy has comprehensive physical security, cyber security, emergency response, and business continuity plans and these plans are tested and updated annually.

All of PECO's emergency preparedness plans are for the entire Exelon Corporation (Exelon) with pertinent parts of the plan being PECO specific. The Physical Security Plan (PSP) incorporates numerous security documents including the Exelon Security Policy, Vulnerability Assessment, Access Control, Threat and Incident Response and various other reference documents. Drills are performed with external agencies such as fire departments, police, etc. on an annual basis. Moreover, the PSP is updated and tested annually.

Exelon has a Management Model that is utilized to implement the Cyber Security Plan (CSP). The Management Model consists of four programs, 34 processes, and hundreds of procedures to address training, data security, risk management, etc. Exelon assigns responsibility to a manager for each of the 34 processes for reviewing and updating these processes on an annual basis. Drills and tests are performed on all major applications twice a year. PECO also has a disaster recovery plan for all critical Information Systems applications which is tested quarterly.

The Emergency Response Plan (ERP) is also Exelon-Energy Delivery wide and includes several PECO specific items. The ERP is comprised of 2 policies, 3 programs, 8 processes, and 60 procedures. PECO also has an Emergency Response Organization that is comprised of eight separate teams that monitor system conditions on a daily basis. PECO performs summer and winter readiness drills. Network and tabletop drills are also performed on an annual basis. In early 2009, PECO performed a drill with the emergency coordinator of the Public Utility Commission and in September 2009, PECO performed a tabletop exercise with the Federal Energy Regulatory Commission (FERC).

Exelon has 68 main plans and 74 pointer plans[2] that make up its Business Continuity Plan (BCP). PECO has a BCP for each of its 15 organizations/departments to include set-up requirements for critical business functions following a disaster such as call lists, alternate locations, vital records, etc. Each business unit has an individual that is assigned to update their BCP. PECO performs BCP tabletop exercises on a regular basis.

Updating the emergency preparedness plans is an important aspect of emergency preparedness and is something PECO has done well. PECO has strived to assure that it is prepared to respond to emergencies such as terrorist attacks, natural disasters, etc. in a timely and efficient manner. Moreover, testing the plans and performing live drills with emergency personnel is also a significant component of emergency preparedness and PECO has demonstrated its readiness to respond to an emergency if it were to occur. PECO has maintained comprehensive emergency preparedness plans and hence has actively pursued security measures and procedures for protecting its operations, customers and its employees.

[2] Plans that only need to have a call list and an alternate location identified.

<u>Staff's Follow-up Recommendation</u> – **None**

XII. CUSTOMER SERVICE

Background – The focused management and operations audit of PECO Energy Company (PECO or Company) conducted by Schumaker & Company was issued August 2007, at D-05MGT048, contained three recommendations regarding the Customer Service functional area. In this chapter, the Audit Staff reviewed two of the prior recommendations and prior situations and two follow-up findings are presented.

Prior Recommendation – Reduce the backlog in electric-theft caseload.

Prior Situation – Between June 2004 and June 2006 a significant increase in electric-theft case backlog without a corresponding increase in cases being closed was noted by Schumaker & Company (or the consultant). This significant increase in cases corresponded to the implementation of theft of service reports in June 2005. Cellnet, PECO's automated meter reading provider, created reports for PECO that identified conditions indicative of meter tampering. The consultant also noted an apparent staffing issue with the field technicians who investigated the cases. Dispatchers, back office support, and field technicians were all from different departments with different priorities. There was not a dedicated Revenue Protection Department.

Follow-up Finding and Conclusion No. 24 – It appears that PECO has successfully reduced its electric-theft caseload by reorganizing its Revenue Protection Department and utilizing several reports to monitor for electric-theft.

Since the completion of the 2006 management audit, PECO has taken several steps to improve its detection of electric-theft and reduce the backlog of electric-theft cases. In October 2008, a Service Level Agreement (SLA) was developed between the back-office support function, which was provided by individuals from various departments, and the Field and Meter Services Department. The SLA specifies that no work order shall exceed 90 days, identifies the various types of work orders (i.e., system generated or manually generated), and prioritizes the various types of work orders. The SLA also specifies the amount of time in which a work order must be investigated:

- 5 days - for known hazards and hotline tips.
- 14 days - for Consumption on Cut Meters (i.e., for meters disconnected for non-payment of service). These are system generated work orders and are considered active thefts.
- 90 days - for manually generated work orders. These are usually for passive thefts (i.e., no tampering involved) and tend to be a lot of false positives.

Another step was taken by PECO in 2008 when it began to use electric-theft reporting software from a CellNet competitor, referred to as DataRaker, on a parallel basis for a six to nine month period to measure the performance of both systems. CellNet achieved a 55-60% success rate versus 70% for DataRaker at detecting electric-theft. Not only did DataRaker achieve higher success rates, but the Revenue Protection Technicians stated a preference for the DataRaker reports and its

functionality. Consequently, PECO made the decision in May 2009 to solely use the DataRaker software reporting package.

In May 2009 a reorganization of the revenue protection function began as a result of PECO management deciding that a dedicated Revenue Protection Department was needed. The reorganization brought the dispatchers, back office support, and field technicians into one department with the sole purpose of revenue protection through the detection of electric-theft. The reorganization was completed in October 2009.

Also in 2009, daily, weekly and monthly scorecards capturing electric-theft caseloads were developed. These scorecards track the various types of work orders to ensure that the work orders are addressed within the specified timelines established through the SLA. This enables management to better monitor and reduce electric-theft case backlogs. As of July 2009 there were no work orders over 90 days old.

With the various changes in the reporting system and the new parameters used for monitoring the workloads, a direct comparison to the backlog identified during the management audit could not be made. However, a comparison of the avoided future losses (AFL), an industry standard method for reporting, shows an approximate 29% increase since the management audit. The AFL for 2006 and 2008 was $12,016,918 and $15,598,000, respectively. The year to date AFL as of August 2009 was $10,482,000 or an annualized AFL of $15,723,000. Hence, it appears that PECO has successfully developed a more focused approach on detecting electric-theft of service recovering the associated losses and is committed to conducting an ongoing program.

Staff's Follow-Up Recommendation – None.

Prior Recommendation – Implement measures to significantly improve the effectiveness of the gas-theft of service program.

Prior Situation – PECO indicated that customers consider natural gas dangerous and wouldn't try stealing natural gas as readily as electricity. Therefore, PECO's gas-theft of service program was not given the same emphasis as its electric-theft of service program. The same reports used to detect electricity theft of service were used to detect gas-theft of service, but they had not resulted in any indications of gas-theft. Electric and natural gas are different products; therefore the consultant recommended that a specific program for identification of natural gas theft be developed.

Follow-up Finding and Conclusion No. 25 – PECO has taken steps to improve the effectiveness of its gas-theft of service program.

Since completion of the 2006 management audit, PECO's Gas Leak Survey Department has worked with their automated meter reading vendor to review PECO's gas-theft of service program. One area flagged for improvement was the gas meter inspection process. Pursuant to 52 Pa Code § 59.34, a utility shall establish and execute a plan by which it will periodically survey each customer-owned service line for

leakage. PECO's established plan requires a survey and inspection of each customer-owned service line for leakage once every three years. Consequently, PECO incorporated procedures for technicians to identify signs of theft during the leak survey process. If a possible theft situation is noted during an inspection, a notification is sent to PECO's Revenue Protection Department that triggers an investigation by a Revenue Protection Technician.

Another inspection process was also developed to coincide with the ongoing Gas Meter Battery Replacement Project. All PECO gas meter batteries are currently being replaced over a six-year span (2004 through 2010). A new cycle for battery replacement will begin in 2013. Technicians replacing batteries are now trained to investigate for signs of gas-theft while they are at the meter. If a possible theft situation is noted, a notification is sent to PECO's Revenue Protection Department that triggers an investigation by a Revenue Protection Technician. This process yielded 6 notifications in the 4th quarter of 2007, 10 notifications in 2008, and 7 notifications through September, 2009.

Starting in 2009, PECO included gas-theft investigations with its theft and safety sweeps (an unannounced investigation of customer meters in a 3 to 5 block area). Five sweeps a year are conducted on select neighborhoods. In 2009 the safety sweeps resulted in 197 gas-theft investigations, with 4 cases of gas-theft being confirmed.

In addition, PECO benchmarked with eight other gas utilities, specifically inquiring about their strategies and processes for identifying gas-theft. None of the eight utilities had a defined proactive gas-theft detection program and most of the utilities rely on field technicians to generate leads on possible theft. However, there were two utilities who were piloting programs with software vendor, Detectent. Detectent's software targets commercial customers, comparing industrial class and usage patterns to generate possible theft situations. PECO plans to start a pilot program with Detectent. PECO is also working with DataRaker to develop proactive gas-theft detection reports.

Starting in 2008, PECO started using computations of avoided future loss (AFL), an industry standard method for reporting, for gas-theft as a parameter to measure the effectiveness of its program efforts. The AFL for 2008 and year to date as of August 2009 was $56,227 and $8,519 (or an annualized AFL of $12,778), respectively. This indicates an approximate 77% decrease which can partially be attributed to the timing and collection of the back billings during the first half of 2009. As PECO continues to enhance its efforts to detect gas-theft of service and recover/reduce losses; it will also reduce safety hazards that result from make-shift connections around the meters.

Staff's Follow-Up Recommendation – None.

XIII. SUPPORT SERVICES

Background – The focused management and operations audit of PECO Energy Company (PECO or Company) conducted by Schumaker & Company was issued in August 2007, at D-05MGT048, contained 12 recommendations regarding the Support Services functional area. In this chapter, three prior recommendations and prior situations are reviewed and three follow up findings and one recommendation are presented.

Prior Recommendation – Implement formal quality assurance activities for major projects.

Prior Situation – The consultant found for all major Information Technology (IT) infrastructure and system enhancement projects that Exelon relied on various processes used on a discretionary basis to perform quality assurance reviews including "after-the-fact" reviews by its Internal Audit (IA) department, IT management review meetings, peer reviews, external consultant reviews, etc. Formal Quality Assurance (QA) teams were used for select IT projects; however, a formal QA role was neither required nor managed centrally by the IT organization for major IT projects. The consultant felt without a centrally managed and formal QA role that QA standards may not have been consistently followed throughout Exelon. Schumaker & Company was concerned that after the fact reviews were often too late, as problems may have already occurred as a result of the issues identified.

Follow-Up Finding and Conclusion No. 26 – **The IT department is in the process of developing and implementing additional QA processes and procedures.**

In 2008, a multi-level task force of IT personnel was formed to evaluate and make recommendations to IT senior leadership on methods to improve quality. The task force analyzed system development activities and issues that could affect quality and identified areas for potential improvement. The task force developed two key recommendations:

- Improve System Development Life Cycle (SDLC) practices and establish SDLC testing standards.
- Establish Quality Management as a core competency within the IT Organization.

In conjunction with the first recommendation, two IT procedures related to testing were developed and implemented, IT-DO-323 V1.2 Test Solution (effective 10/1/08) and IT-DO-352 V1.3 Perform Required Testing (effective 1/1/09). As of late 2009, the task force was still reviewing which detailed testing practices to develop as an extension of the procedures. Test planning and test execution as standard practices were under consideration for development. Development of recommended actions from the reviews began in 2009 with implementation planned for 2010.

An IT process improvement effort was also initiated at PECO in 2009 to establish a formal, measurable process around five key IT process areas. Testing/QA was one of the IT process areas. The process improvement effort is designed to produce improvements that will result in new best practices that can be applied throughout the IT organization. The PECO Supervisory Control and Data Acquisition (SCADA) Replacement Project was selected to be the project to execute/pilot the process improvement effort. The Audit Staff reviewed the IT Process Improvement Effort Executive Summary for the SCADA Replacement Project that summarizes activities, status, and outcomes of each step for Testing and QA as of December 9, 2009. Included as part of the review was a Testing and QA section indicating project status and a detailed dashboard evaluating the process areas including Testing and QA and the dates various processes were performed or the indication "complete".

A formal QA function should be performed on all major projects to ensure IT best practices are being followed and to help prevent or at least identify problems at an early stage. QA procedures should be performed throughout the project lifecycle.

Staff's Follow-up Recommendation – Complete the development and implementation of formal quality assurance functions for major projects.

Prior Recommendation – Develop a plan to ensure consistent implementation of a project management methodology with enhanced capabilities across the IT and other Exelon organizations.

Prior Situation – Exelon IT project management methodologies were not being properly and consistently implemented across groups and projects. Exelon had developed a standard set of management controls that supported both the efforts identified by the business units and those sponsored by IT. However, the procedures were relatively new and not yet fully implemented across groups and projects.

Also, a formal IT QA role was lacking putting PECO at risk, especially for high profile projects. Although selected projects used formal QA teams, a formal quality assurance role was neither required nor managed centrally by the IT organization, see Follow-Up Finding and Conclusion No. 26

Additionally, the Exelon IT organization was not placing a strong emphasis on staff certification as Project Management Professionals (PMPs). On-the-job training was the primary method used to train project management skills to employees.

Follow-Up Finding and Conclusion No. 27 – The Exelon IT organization has developed and implemented defined IT project management methodologies.

The Company instituted a number of project management program improvements within the IT organization since the management audit. Among these are:

- Implementation of monthly Chief Information Officer (CIO) project management review meetings. Purpose of the meetings is to improve project delivery by ensuring projects are executed consistently; critical project needs are supported; change management is consistent and effective; and cross project interdependencies are managed and also to provide a regular forum for continuous improvement, open dialog, and input from senior leadership for IT project leaders. Three to four projects are reviewed each month and are selected based upon business impact, emerging technology, cost, and risk.
- Implementation of a project management peer group comprised of managers from all areas of the IT department. This group meets to share expertise and knowledge, identify areas for improvement, and improve communication among managers. A formal charter outlines the mission, scope and objectives of the group.
- The requirement to conduct Post Implementation Appraisals (PIAs) for IT sponsored projects. The IT Project Manager must conduct a PIA within one year of completion of a project, if the project was budgeted at greater than $5 million or was selected by the IT CIO for review.
- A PMP certification program was instituted in January 2008. The program requires Managers/Lead Analysts leading projects of $1 million or greater to attain PMP certification. As of December 2009, 30 out of the 70 IT employees, or 43% had attained certification. An additional ten IT employees have completed the required training and were preparing for the PMP certification test.

Through implementation of project management programs and procedures, the Exelon IT organization is attaining consistent project management methodologies administered by a qualified professional staff.

Staff's Follow-up Recommendation – None.

Prior Recommendation – Continue to strengthen Exelon's risk management program.

Prior Situation – At both the Exelon and PECO levels risk management was being proactively addressed. The goals of Exelon's risk management program were to provide governance and oversight for risk management; identify, measure, and prioritize significant risks; manage risks; communicate risk information to senior management; and evaluate compliance with Exelon risk policy. Specific responsibilities for business units, including PECO, were risk identification and assessment, risk response and mitigation, and risk communication.

In 2006, Exelon's Corporate Planning & Risk organization looked to build upon its risk management activities by developing a comprehensive approach to focusing proactively on risk prevention and controls rather than just reactively addressing risk. Exelon was in the early stages of a multi-year process to upgrade and formalize the risk management program.

<u>Follow-Up Finding and Conclusion No. 28</u> – Exelon's risk management program was enhanced and incorporated into updated policies and procedures.

Exelon's Risk Policy (RK-AC-1) was updated to reflect requirements for operating companies to be responsible for establishing comprehensive risk management programs. Also updated was the Exelon Risk Management Committee Charter. The Risk Management Committee (RMC), comprised of senior management representatives from Exelon operating companies and chaired by the Chief Risk Officer, provides oversight of the Exelon Risk Management Program. The RMC's primary purpose is to ensure there is a functioning comprehensive Risk Management Program in place that satisfies the goals and principles identified in the Exelon Risk Policy.

A new procedure, Exelon Risk Process (RK-AC-10), was also developed with the purpose of providing operating companies guidance and instruction for the development and maintenance of risk programs that satisfy the goals and principles of the Exelon Risk Policy. The Exelon Risk Process defines responsibilities of the Risk Oversight Committee (ROC), RMC, and the operating companies. Among responsibilities for the operating companies are:

- Establishing defined risk policies.
- Assigning an individual with responsibility to perform the implementation and maintenance of a risk program.
- Providing a risk inventory to the Exelon Chief Risk Officer.
- Reviewing the risk program annually.

The Exelon Risk Process defines the risk management process as:

- Providing governance and oversight for risk management at Exelon.
- Identifying, measuring, and prioritizing significant risks across Exelon on a periodic basis.
- Managing risks by determining and implementing the appropriate response and controls for each identified risk – avoiding, accepting, reducing, and/or sharing risk.
- Communicating risk information to senior management and the Board of Directors on a timely basis.
- Evaluating compliance with risk policy across Exelon and the effectiveness of the policy at meeting risk management program goals.

Another new procedure, PECO Risk Process (RK-PE-10), mirrors the Exelon Risk Process in many aspects including the risk management process. However, PECO specific references are made and a PECO leadership team, comprised of PECO senior management, is responsible for providing oversight of PECO's Risk Management Program. The PECO Senior Vice President & Chief Financial Officer is responsible for establishing and maintaining a risk program that satisfies the goals and principles of the Exelon Risk Management Program. Among his responsibilities are:

- Providing a risk inventory with appropriate prioritization to the PECO leadership team and the Exelon Chief Risk Officer on an annual basis. The inventory will summarize efforts to identify, measure, and prioritize significant risks, as well as report status to management of each identified risk.
- Ensuring that the PECO risk program is reviewed annually.
- Actively soliciting input from areas within Exelon Business Services for risks that impact PECO and including these in PECO's risk inventory.

Exelon has improved its risk management program on an enterprise-wide basis. The Company takes a comprehensive and proactive approach to risk prevention and control. Through updating current risk policies and implementing new risk procedures delineating the risk management process for both Exelon and PECO, a consistent documented enterprise-wide risk management program is in place.

Staff's Follow-up Recommendation – None.

XIV. ACKNOWLEDGEMENTS

We wish to express our appreciation for the cooperation and assistance given to us during the course of this Management Efficiency Investigation by the officers and staff of PECO Energy Company.

This audit was conducted by Michael Palewicz, Lori Burger, and Porus Irani of the Management Audit Staff of the Bureau of Audits.