MONTGOMERY COUNTY MARYLAND

PEPCO WORK GROUP

FINAL REPORT

4.20.2011

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(Biographies are contained in Appendix A)

"Public services are never better performed than when their reward comes in consequence of their being performed, and is proportioned to the diligence employed in performing them."

Adam Smith, *The Wealth Of Nations*, Book V, Chapter 1, Part II, para. b20.

PEPCO WORK GROUP
Montgomery County, Maryland

April 20, 2011

The Honorable Isiah Leggett
Montgomery County Executive
Executive Office Building, 2nd Fl.
101 Monroe St.
Rockville, MD 20850

Dear Mr. Leggett:

On behalf of the Pepco Work Group, it is my pleasure to transmit the attached report for your consideration. In October, 2010 you appointed this group to investigate causes for Pepco's frequent electricity outages in our County. Over the last seven months our group has held ten plenary meetings and two dozen subgroup meetings. We have met with Pepco and Pepco Holdings, Inc. (PHI) executive leadership to gain their insights on the causes of the company's reliability problems and met with senior staff from Baltimore Gas & Electric to better understand their operations and how their practices relate to those of Pepco. In addition, we reviewed dozens of reports and conducted an online customer survey and held a public hearing to receive input from both residential and commercial Montgomery County Pepco customers. We received over ten thousand responses to the survey, and had approximately 50 individuals and 17 speakers attend our public hearing. We received another 900 inputs from County residents via a website.

Our report contains an Executive Summary that, in brief, recommends that the Maryland Public Service Commission establish stringent standards and utilize its authority to impose remedies sufficient to align Pepco's financial interests with the interests of the community. Pepco should be measured against publicly-disclosed best-in-class performance, should adopt industry best practices, and should proactively seek continual improvement. In support of this, the State should assure that the PSC is appropriately staffed to implement such a process.

It is the Work Group's view that Pepco should adopt, fund and *execute* a multi-year plan for system inspection, maintenance and enhancement that, with appropriate measures of results, will replace its current largely reactive process of responding to failures and to public scrutiny. Pepco's proposed Six-Point "Reliability Enhancement Plan," while constructive, falls short of meeting this requirement in both scope and urgency.

We further recommend that Pepco upgrade both its human and automated processes for providing timely and accurate information to customers and government representatives during both Major and Non-Major Events. Pepco should implement processes and procedures to assure that sufficient personnel (employees and contractors) are available to successfully undertake all preventative maintenance necessary to assure reliable

electric service on an ongoing basis and to restore service in a timely manner during outages. PHI should establish an ombudsman activity relating to Pepco and reporting directly to the Chairman and CEO of PHI to help create a more customer-oriented culture.

In addition, Montgomery County and other local governments should work with Pepco to provide the authority needed to implement more effective vegetation management programs while respecting to the maximum practicable extent customer concerns in this area.

While much needs to be accomplished, largely by Pepco itself, the single most important action that can be taken by those outside the company is to establish a carefully considered, aggressive package of financial incentives and punishments that appropriately align Pepco's priorities with those of the community.

We would like to thank you for the opportunity to serve our community and hope that you find our work helpful in your efforts to ensure that Montgomery County residents and businesses receive quality electric utility service. We would also like to commend Tom Street and the members of the County staff with whom we worked for their exceptional dedication and professionalism.

Sincerely,

Norman R. Augustine

Norman R. Augustine
Chair, Pepco Work Group

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LIST OF ACRONYMS

AMI	Advanced Metering Infrastructure
ANSI	American National Standards Institute
BGE	Baltimore Gas and Electric
BSA	Bill Stabilization Adjustment
CAIDI	Customer Average Interruption Duration Index
COMAR	Code of Maryland Regulations
DLC	Direct Load Control
DOT	Department of Transportation
DR	Demand Response
EMG	Emergency Management Group
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
ETR	Estimated Time of Restoration
GIS	Geographic Information System
ICS	Incident Command System
IEEE	Institute of Electrical and Electronics Engineers
kV	Kilo-volts
kWh	Kilowatt hour
MAMA	Mid Atlantic Mutual Assistance
MC	Montgomery County
MSI	Market Strategies Incorporated
NESC	National Electric Safety Code
OEMHS	Office of Emergency Management and Homeland Security
O&M	Operations & Maintenance
OMS	Outage Management System
OPC	Office of the People's Counsel
Pepco	Potomac Electric Power Company
PHI	Pepco Holdings Incorporated
PSC	Public Service Commission
ROW	Right of Way
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SEE	Southeast Electric Exchange
SWG	Sustainability Working Group
T&D	Transmission and Distribution
TSF	Time Service Factor
URD	Underground Residential Distribution

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1—EXECUTIVE SUMMARY

Background[1]

For a number of years, the residents and businesses of Montgomery County have experienced electric power outages that have been extremely disruptive to community activities because of their frequency, extent, and duration. There has, until relatively recently, been little evidence of improvement—and in some respects the opposite appears to be the case. During severe storms substantial numbers of Montgomery County's residents served by the Potomac Electric Power Company (Pepco) have been without power, often for extended periods of time (Figure 1).

Figure 1 – Chronology of Major Events Impacting Montgomery County Power Supplied by Pepco

Timeline	Event	Total Customers Out at Peak (Montgomery)	Total Customers Out at Peak (Maryland)
2011	Snowstorm (1/26 – 1/29)	136,695	189,589
2010	Severe Thunderstorm (8/12 – 8/15)	77,445	87,219
2010	Severe Thunderstorm (8/5-8/7)	2,077	73,193
2010	Severe Thunderstorm (7/25 - 8/31)	238,977	290,872
2010	Severe Snowstorm (2/5 – 2/12)	77,574	90,858
2008	Severe Thunderstorms, Marine, and Tornado warnings (6/4)	126,562	177,538
2006	Severe Thunderstorm (7/4)	17,498	56,243
2006	Winter Storm (2/12)	16,509	60,762
2005	Severe Thunderstorm (7/27)	43,703	59,074
2003	Major Wind Storm (11/13)	42,903	89,607
2003	Hurricane Isabel (9/17 – 9/22)	226,758	394,988
2003	Severe Thunderstorm [Mesoscale Convective System Storm] (8/26-8/30)	83,595	135,299

The ubiquity of everyday activities that now depend upon the availability of electric power magnifies the critical nature of power failures. The consequences of outages include major financial losses suffered by businesses and residents, hazardous conditions for some residents, and inconvenience for all residents and firms. Such experiences have occurred in spite of the often heroic efforts by Pepco field crews that have on occasion operated under extraordinarily difficult conditions. It is to the credit of these individuals and Pepco that such challenging activities have in general been undertaken while maintaining a strong record for safety.

Seeking to prevent the recurrence of the problems that have been encountered in the past, the Montgomery County Executive on October 4, 2010 established the Montgomery County Pepco Work Group (herein referred to as "the Work Group") made up of residents of Montgomery

[1] Footnotes regarding sources have not been included in this Executive Summary because they are to be found in the corresponding material contained within the body of the report. Appendix H contains a list of principal reference documents.

County charged with providing an assessment of Pepco's performance and proposing corrective steps, as appropriate. The Work Group, consisting of 12 members with highly diverse professional backgrounds and serving without compensation included individuals with experience in such areas as construction, engineering, regulation, legislation, and business. The Work Group was allotted seven months to accomplish its task, during which it held 10 meetings as a body and two dozen meetings of sub-groups which were formed to address specific issues. The Work Group heard from more than 20 outside presenters, including the Chairman and Chief Executive Officer (CEO) of Pepco Holdings, Inc. (PHI), the president of Pepco, and senior representatives of Baltimore Gas and Electric (BGE). The Work Group held one televised public hearing that was attended by approximately 50 people during which presentations were made by 17 Montgomery County residents. The Work Group members have communicated among themselves by electronic means on a frequent basis and established an email address for inputs to be made by the public using electronic means. More than 900 comments were received.

In addition, the Work Group conducted an informal online survey to sample Pepco customer attitudes to which over 11,000 responses were received. Although not intended to satisfy rigorous scientific polling standards, the results demonstrate the widespread adverse impacts the quality of electric service being provided to the community by Pepco has had on Montgomery County businesses and residents. Surveying their own experience, the Work Group members, having collectively lived in fifteen different states, could recall none that experienced the number and extent of power outages occurring in Montgomery County.

In keeping with the instructions of the County Executive, the Work Group has focused its attention on bettering Pepco's future performance rather than on battering its past performance. Nonetheless, it is necessary to *understand* the past if one is to preclude the problems that plagued the past from recurring in the future. The Work Group has sought to do this and its findings and associated recommendations are provided herein.

Potomac Electric Power Company (Pepco)

Pepco is a subsidiary of PHI and provides electric distribution services to customers in portions of Montgomery County (308,000), Washington, D.C. (254,000), and parts of Prince George's County (222,000). Pepco is a regulated utility and its monopoly position makes it immune to most of the competitive performance pressures found in a free economy. PHI (**NYSE**: POM), however, is listed on the New York Stock Exchange and as such must compete against listed companies as well as others based on its own financial outlook for much of the capital required to extend, upgrade and operate its services.

The company employs approximately 1,300 workers and within Montgomery County operates 34 substations, nearly 5,000 miles of overhead lines, and nearly 7,000 miles of underground lines. It provides services to its customer base via 69,000 volt and 34,000 volt sub-transmission lines and 13,000 volt distribution lines to its customers. Its customer base is approximately 90 percent residential and 10 percent commercial or government. In 2010, PHI's revenues were $9,259,000,000 and its reported profits were $256,000,000.

Historical Perspective

Much of the attention that has been focused upon Pepco in recent years has related to its performance during Major Events[2], although, as will be discussed later, substantial problems have also evidenced themselves during so-called normal weather conditions.

When assessing Pepco's performance it is useful to trace experience back at least to 1999, when a severe ice storm left some 230,000 Pepco (MD) customers without power. Following this event, the company undertook several initiatives to improve day-to-day power service and to enhance the system's resilience during and after major storms. These initiatives were severely tested when Hurricane Isabel struck the region during September 2003. At the peak of the outages experienced during Hurricane Isabel some 76 percent of Pepco customers were without electric power and more than 5,000 wires were reported down in Pepco's service area.

Following Hurricane Isabel, PHI contracted with an outside consulting firm experienced in emergency management, James Lee Witt Associates, L.L.C. (the "Witt Report"), to conduct a review of Pepco's response to the storm. The principal findings of that review were that there was "[a]n insufficient appreciation on the part of Pepco...that the outage was a community event, not just a utilities event;" that there was "a need for sharper and more rapid focus on customer service in a disaster environment;" and there was "a need for the (Pepco) emergency management function to have a higher priority, with emphasis on developing operating concepts and support systems that can be scaled in response to both routine and mass outages."

Particular attention has been focused on the issue of vegetation-caused outages. Although there may not be a direct correlation between tree-trimming budgets, reliability standards, and revenues and profitability, the trends identified in Figures 2 and 3 create concern for the Work Group and suggest that Pepco has not been without financial resources. The Work Group used PHI information because Pepco data for profitability and tree trimming budgets were not available.

For a brief period following Hurricane Isabel in 2003, Pepco strengthened its system maintenance efforts; however, this increased level of activity soon lapsed into pre-storm practices or worse. That this would be the case was suggested by Pepco's response to the Witt Report and to its own assessment of performance during and following the storm—the latter being required by the Maryland Public Service Commission (PSC). The company's response included such statements as, "[t]his report shows that Pepco has in place today the appropriate operational standards and procedures—having the greatest weight upon a utility's ability to perform in a storm—that are within or better than the industry means. These operational standards include (Pepco's) System Maintenance Expenses, Capital Investment, Staffing Levels, and Vegetation Management Programs." And, "...the capital expenditures for reliability related projects have increased...this clearly shows that Pepco continues to replace and upgrade existing infrastructure." And, "[c]ompared to other utilities, Pepco is *above average* (emphasis in original) in its T&D (transmission and distribution) maintenance practices, as well as its tree trimming cycles and (has) made adjustments to assure exceptional performance." With respect to tree trimming, the response stated that, "[t]he solution, however, lies somewhat outside the

[2] Major Event outages are defined as events where more than 10 percent or 100,000 (whichever is less) of the electric utility's Maryland customers experience a sustained interruption of electrical service and restoration of electric service to these customers takes more than 24 hours.

Figure 2 – Ratio of Vegetation Management Budgets to PHI Revenue and Profits

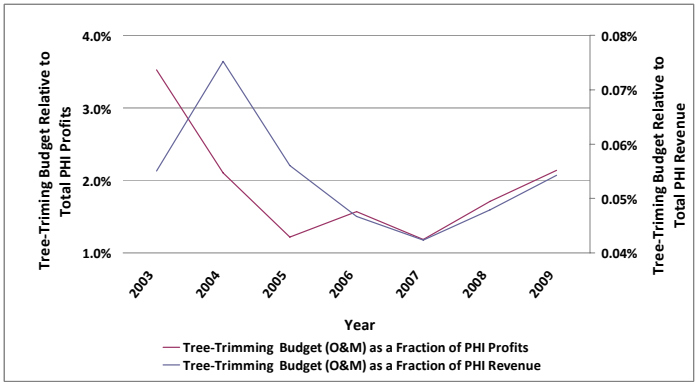
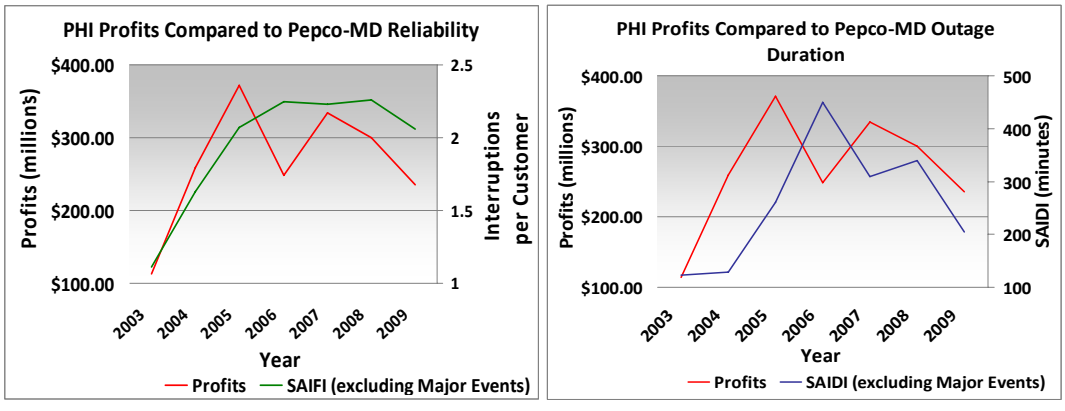


Figure 3 – Comparing PHI Profits to Pepco (MD) Reliability and Outage Duration for 2003 – 2009



control of the company for several reasons." Regarding the proposal to underground power lines, "[w]hile placing power lines underground may result in fewer outages, when outages do occur they are typically of longer duration and more costly to repair....Nevertheless, this is an issue that the community wants us to investigate and we are doing so."

While arguably substantively accurate, such comments reflect to the Work Group a company that is complacent in the face of critical input rather than one that is aggressively seeking means to remedy past shortcomings. Indeed, in the years not long after Hurricane Isabel the company began to decrease, not increase, its vegetation maintenance funding. This attitude, it should be noted, contrasts to a considerable degree with the commitment expressed to the Work Group by the current Chairman and CEO of PHI.

In the years following Hurricane Isabel (in 2003) Pepco's performance continued to deteriorate and profits initially increased and then remained generally unaffected. The Work Group makes this connection between profits and performance not with the intent of making a judgment

related to whether Pepco is entitled to the profits it has received, but rather to point out that unlike more traditional companies whose revenues and profits have a direct connection to the quality of the services or products they sell to their customers, this is not the case for regulated utilities whose profits and revenues are impacted almost exclusively through actions taken by the State entities that regulate them. There is no free market economic signal that will, by itself, compel a utility to improve its performance.

Over time, (2003-2008) the company's performance became so inconsistent with industry standards that Pepco began to take steps to reverse the prevailing trend. At this point performance measures did in fact begin to improve. However, a series of additional challenges soon confronted Pepco and the community it serves, including the virtually unprecedented series of snow storms that occurred in February 2010 and the thunderstorms of July and August of that same year. During these storms widespread, prolonged outages were experienced by Pepco customers throughout the County (Figure 4 and 5).

An even more recent event was the snowstorm of January 2011 that triggered a series of legislative and regulatory actions intended to respond to strong community dissatisfaction with Pepco's performance in such areas as preventing outages, restoring service, and communicating with customers. Coincidentally, the Work Group was meeting with senior representatives of BGE the evening before the January storm struck and was uniformly impressed by the differences in preparation and culture evidenced by BGE as compared with that characterizing many of Pepco's practices. For example, during the January 2011 snow storm BGE had 2.2 times as many restoration personnel engaged per outage as did Pepco. While storm paths can be erratic, Montgomery County outages seemed to be inexplicably high by any reasonable expectation (Figures 4 and 5).

Figure 4- July 25-31, 2010 Major Storm (42 hours after start of event)

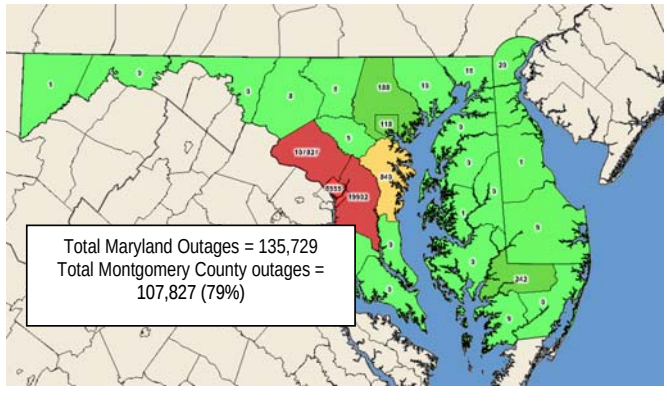
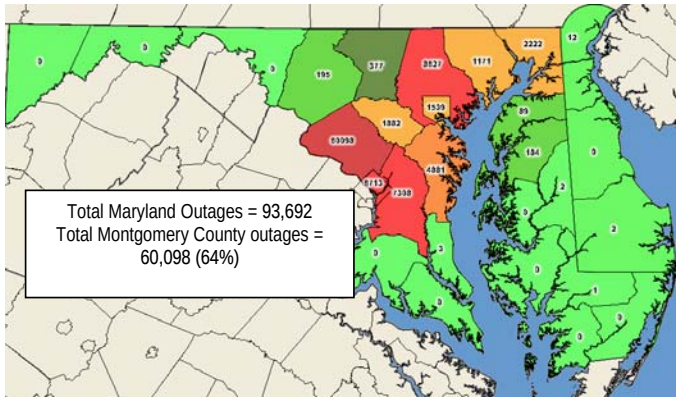


Figure 5 - January 26, 2011 Major Storm (50 hours after start of event)



Assessment

A number of organizations have established metrics for specific aspects of electric utility performance. Unfortunately, there are numerous inconsistencies among these measures. Further, it is very difficult to compare the performance of two particular utilities because of disparities in such factors as population density, weather severity, rate structures, and local vegetation characteristics. Major Event outage maps, for example, are subject to the peculiarities of specific storm paths—although sometimes the disparities in power service are simply too great to be disregarded. For example, in the January 2011 snow storm, Montgomery County outages comprised a full one-third of those in the entire state of Maryland and 50 hours after the storm 56 percent of Montgomery County disruptions had been restored as compared with 86 percent for the rest of the state.

Because of the complexity of defining a single, credible measure of performance it has become common practice among utilities to use two families of performance indicators, one applicable to conditions prevailing during severe storms, i.e., Major Events, and another applicable to Non-Major Event conditions[3]. Even this approach has been plagued with vagaries such as those arising over the treatment of "small" and "medium" sized storms, brief interruptions (less than one minute), planned outages (e.g., stoppages for maintenance—which generally are not counted in the reported metrics—even though from a customer's standpoint they still represent power interruptions); and the definition of what are commonly referred to as "blue-sky" conditions.

The most prevalent method for assessing *Non-Major Event* power company performance utilizes three separate but related parameters. The first of these is called the System Average Interruption Frequency Index (SAIFI) that measures the average number of outages (exceeding five minutes duration and typically excluding Major Events) experienced per customer. This is the generally accepted measure of system reliability. The System Average Interruption Duration Index (SAIDI) indicates the average time a customer is without power (with the above exclusions) over the course of a year. This is often treated as an indication of total inconvenience to a customer. Finally, the Customer Average Interruption Duration Index

[3] The Work Group uses the phrase "Non-Major Event" to refer to outages occurring during minor storms or "blue sky" conditions that do not meet the Code of Maryland (COMAR) thresholds set forth for Major Events.

(CAIDI) measures the average duration of individual interruptions. This is frequently viewed as a measure of how long it takes to restore power when an interruption has occurred. (It will be seen that CAIDI equals SAIDI divided by SAIFI) (Figure 6).

Comparisons of Pepco with other selected utility companies under Non-Major Event conditions reflect unfavorably upon Pepco for both reliability and total outage (Figure 7).

In the case of the System Average Interruption Duration Index, Pepco performance has substantially improved over the past three years but is still inferior to the 2009 overall industry average by 53 percent. With regard to the System Average Interruption Frequency Index, Pepco performance is currently inferior to the industry average by 75 percent.

Figure 6 – Pepco Non-Major Event Performance

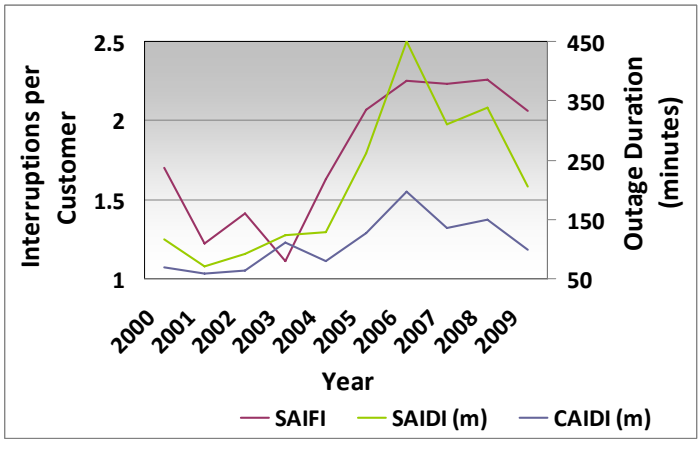
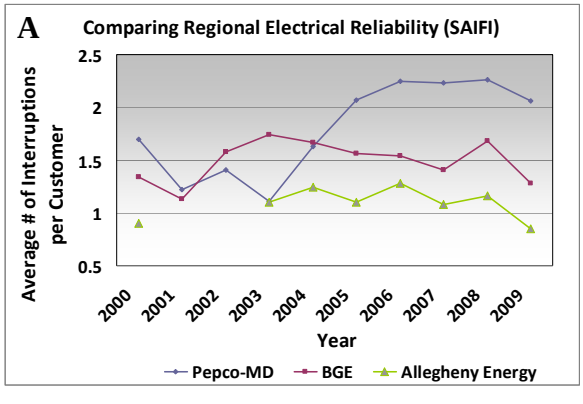
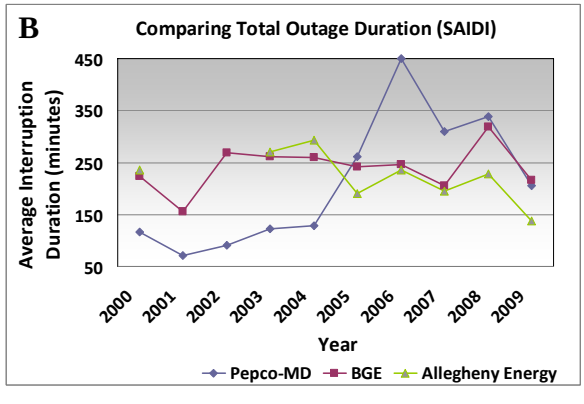


Figure 7 – Pepco Performance Compared to other Maryland Utilities (2000 – 2009)



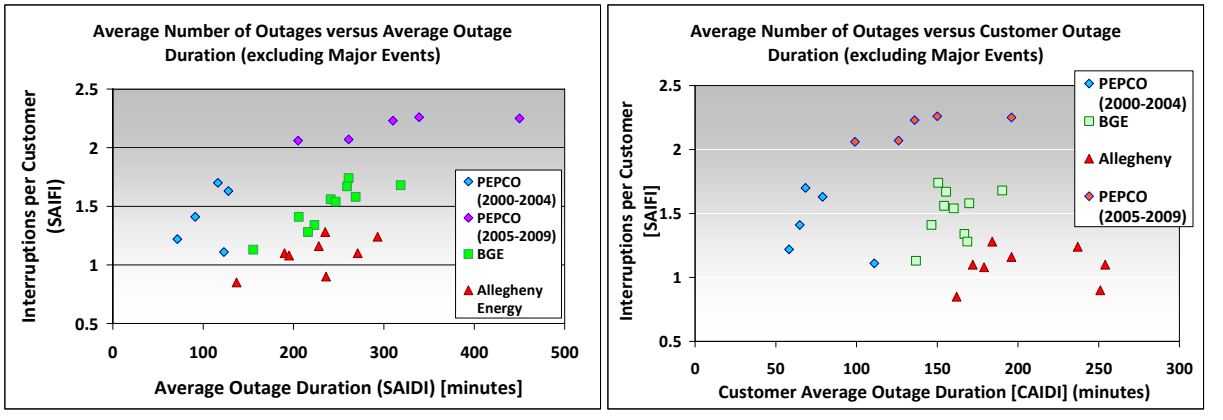


Other measures of particular significance to individual customers include the performance of, say, the poorest performing two percent of all circuits. In the most recently reported data, the average SAIDI and SAIFI of these trouble-circuits are five and ten times worse, respectively, than the average for all other Pepco-MD circuits. The System Average Interruption Duration Index for these problem circuits is over 1,000 minutes per year, excluding momentary (less than one minute) interruptions. Also of interest is the list of customers that have remained in the

"poorest served" category for the longest period of time. Pepco maintains records of such parameters and states that it uses them to help establish service priorities.

A comparison of Pepco performance in terms of reliability (SAIFI) and response (CAIDI) under Non-Major Event conditions reveals that Pepco's performance was actually superior prior to 2004, after which it deteriorated markedly in terms of reliability and overall outage duration (Figure 8).

Figure 8 – Comparing Interruptions per Customer with Average Outage Duration



Defining measures to assess comparative performance among utilities under Major Events is particularly challenging because weather can be quite localized—and certainly so when comparing service in various regions of the country or even within Montgomery County. Major Event parameters which were examined by the Work Group include the (peak) fraction of customers without service and the time duration required to reduce that value by a specified factor. Comparisons among utilities affected by *a specific storm* can thus be made, still recognizing that geographical dissimilarities and differences in storm conditions can be present (Figures 9 and 10).

In the case of the January 26, 2011 snowstorm, 35 percent of Pepco (MD) customers were without service at the outage peak, as compared with 10 percent of BGE customers. Pepco reduced the above fraction of outages by one-half in 24 hours, as compared with 18 hours, in the case of BGE. The corresponding times to reduce the number of customers without power to ten percent of peak outages for the providers were 66 and 48 hours for the two providers, respectively (Figures 9 and 10).

Figure 9 – Service Restoration over Time Following the February 2010 (A), July 26, 2010 (B), August 5, 2010 (C) and January 26, 2011 (D) Events

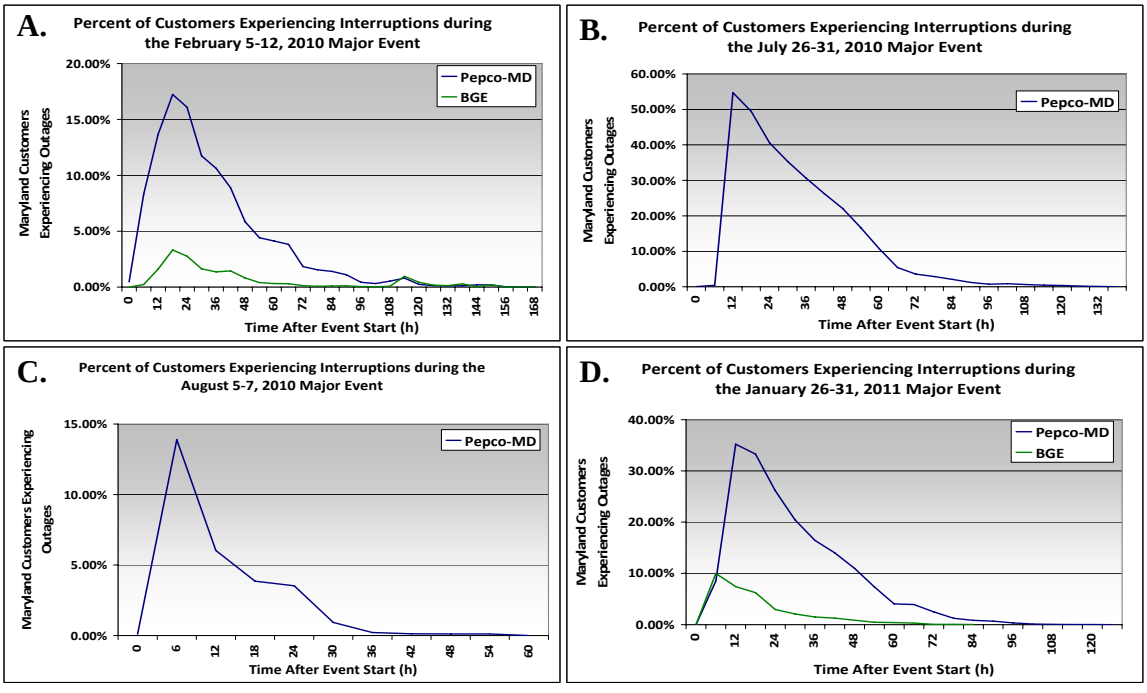
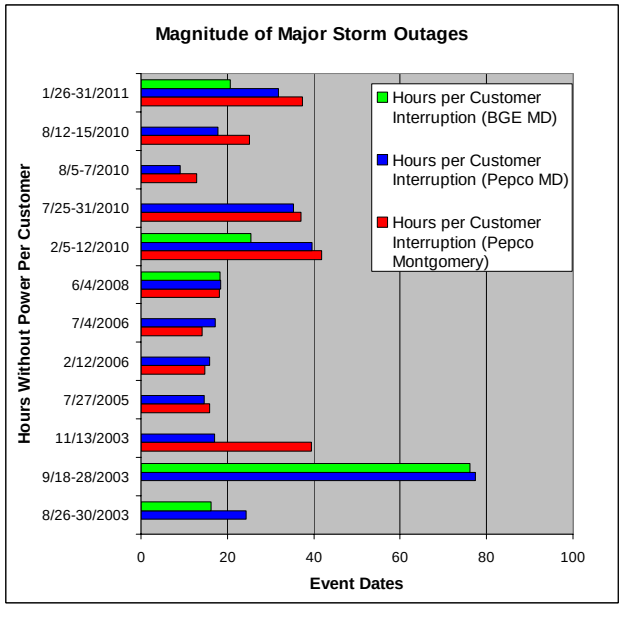


Figure 10 – Duration of Customer Outages for Several Major Storm Events



The Vegetation Debate

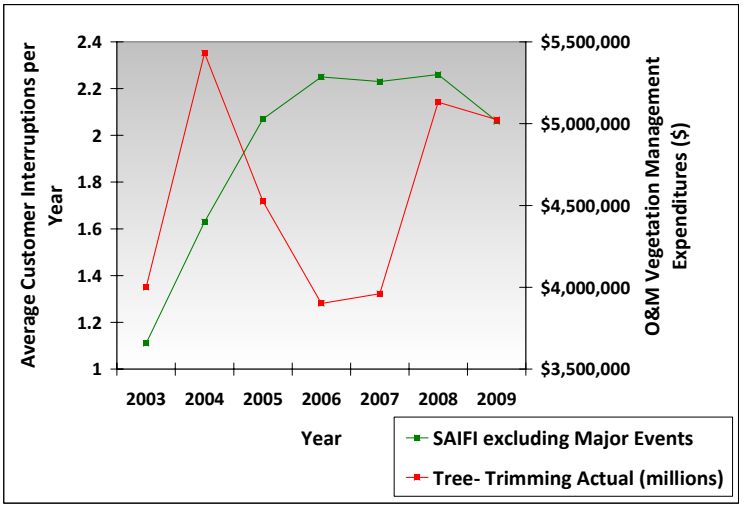
Pepco has maintained that the problems it has encountered have been overwhelmingly attributable to vegetation interference—trees or limbs falling across power lines and shorting or even severing them. The company points to the extent and character of the vegetation which exists in Montgomery County and asserts that this imposes conditions that are considerably more demanding than those prevailing in areas served by many or even most other power companies. That there is an element of validity to this position is suggested by the company's performance in the District of Columbia, which is considerably superior to that achieved in Montgomery County (noting that the District of Columbia has a far higher proportion of underground lines as well as fewer trees). On the other hand, there are other parts of the country as well as other nearby locations served by other utilities with dense vegetation that receive superior performance to that achieved by Pepco.

The debate over trees has become a focal point of the disagreement in Montgomery County between the company and its customers and has led to confusion over what in fact is the root cause of the extraordinary number of outages suffered by Montgomery County's residents and businesses. This is important because the optimal allocation of Pepco's resources depends upon an understanding of the causes of outages. Unfortunately, records of storm outages are not definitive: for example, is an outage resulting from a branch blown across a power line caused by the wind or by the branch? Is an outage resulting from a tree that has fallen because of weakened roots in rain-soaked ground caused by the rain or by the tree? Records are often vague in these and other regards, perhaps in part due to the difficult circumstances under which such assessments are usually made. Further, in some years the *primary* reported source of outages has been simply "Other Major Causes." Obviously, this categorization is not helpful in formulating corrective action plans. What does seem clear is that those working closest to recovery operations consider that vegetation is *involved in* a large fraction of Major Event outages, whether or not the outage is specifically *attributed to* vegetation in formal documentation.

The vegetation issue can be clarified by distinguishing between Major Event performance and Non-Major Event performance. In the case of the former, the Work Group concludes that vegetation is indeed the primary cause of disruptions. However, in Non-Major Event conditions, outages are primarily attributable to system internal malfunctions (switch failures, transformer outages, etc., that not uncommonly are a consequence of inadequacies in preventative maintenance) or by animal interference (potentially avoidable with barriers). That there is some correlation even during Non-Major Event conditions between vegetation management spending and reliability appears undisputable (Figure 11).

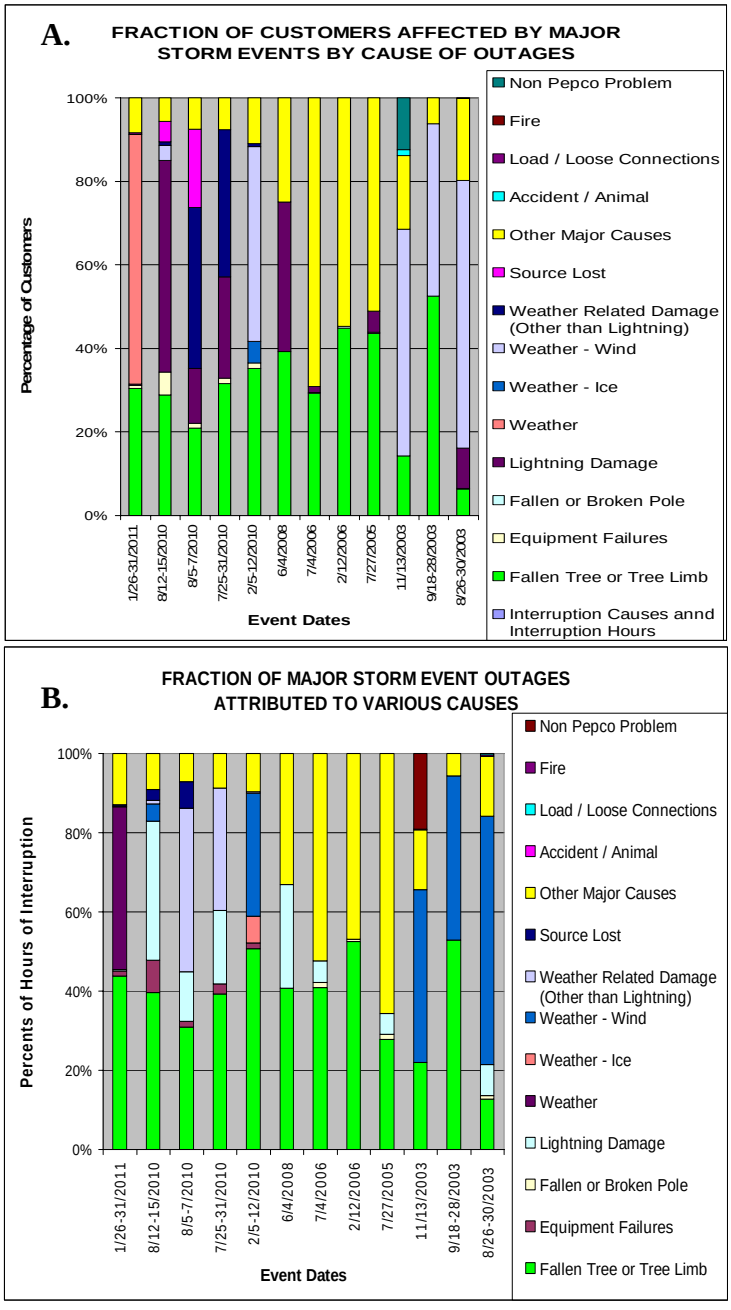
Thus, Pepco appears to be correct in its explanation in the case of Major Events; and those who point to inadequacies of equipment and a lack of preventative maintenance are also correct...but (primarily) in the case of Non-Major Events. Because the overall period without major storm activity is greater than that *with* such storms, the cumulative reason for overall outages can be largely attributed to internal system failures. The fact that greater public attention is focused on power disruptions during major storms due to their extensiveness and persistence perhaps accounts for a part of the focus on vegetation…a focus which is necessary, but not sufficient (Figure 12).

Figure 11 – Pepco-MD Reliability versus O&M Vegetation Management Expenditures (2003-2009)



Corrective actions related to vegetation removal also help improve minor storm performance, albeit to a lesser degree. Unfortunately, in a few circumstances this vegetation management strategy places in conflict the desire of Montgomery County residents to maintain the natural beauty of the community on the one hand and the desire to have reliable electric power on the other. Nonetheless, much can be, and some is being done to eliminate outages caused by vegetation. It is important that this activity be continued on both an expedited and sustained basis.

Figure 12 – Percentage of Major Event Outages Attributed to Vegetation as Reported by Pepco



Customer Communications

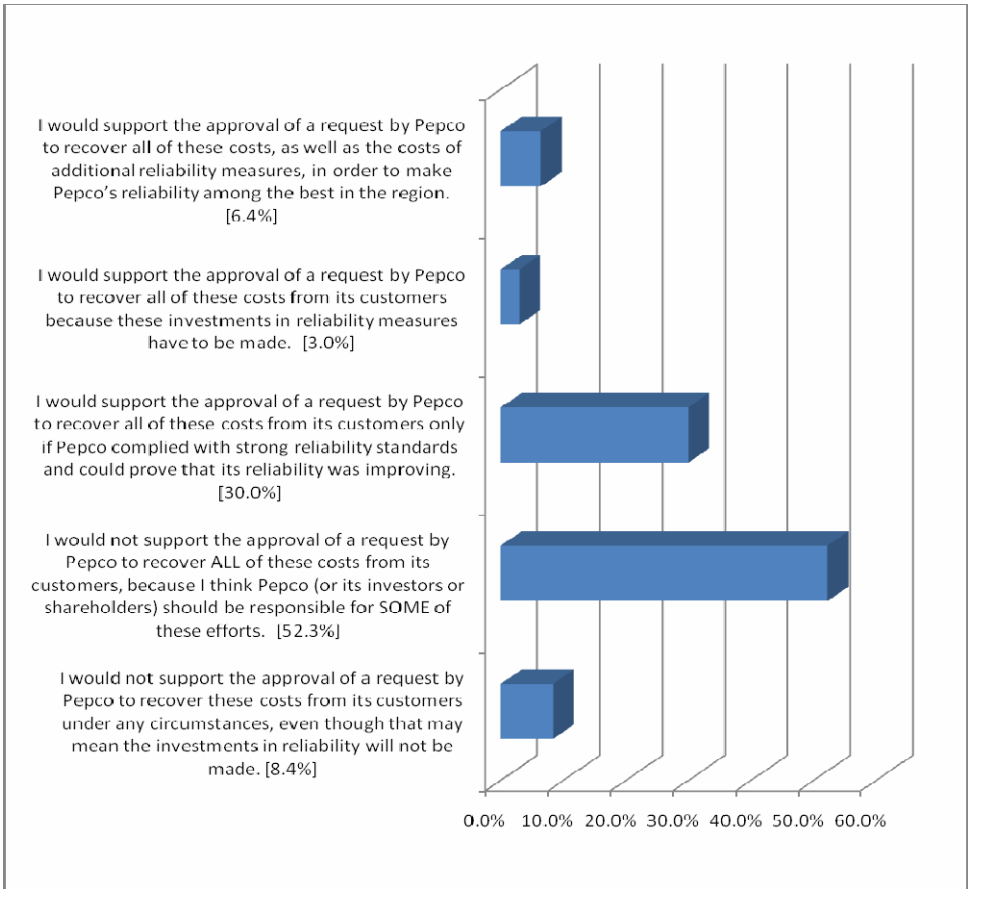
The impact of inadequacies suffered in the provision of electric power service in Montgomery County has, unfortunately, been exacerbated by a breakdown in Pepco's communications with its customers and with government entities, particularly during Major Events. The Work Group heard repeated complaints that customers were unable to obtain an accurate assessment as to when their power might be restored so that they could implement their own recovery plans (move to a hotel, obtain dry ice for a freezer, obtain an emergency generator, seek special medical assistance, etc.). In many cases callers received erroneous information or were unable to contact Pepco at all.

In an effort to better understand the concerns of Pepco's Montgomery County customers, the Work Group conducted an online survey of customer attitudes and performance. This was not a truly scientific poll—for example, the respondents were self-selected. However, the magnitude of the response (more than 10,000 replies), and the strong sentiments expressed, can hardly be ignored. Of particular significance was the conviction that if ratepayers were to be expected to absorb higher electricity bills in order to be provided with more reliable service, this should only occur if Pepco management and the firm's shareholders also incurred some of the costs or if Pepco were held to strong reliability standards (Figure 13). While these views may be irrelevant to the law and regulatory principle, understanding these sentiments is important for local and state elected officials seeking to have reliable electric power provided to the communities they represent.

Although an anachronism in an age of advanced technology, Pepco's primary means of ascertaining the working status of its distribution network is customer complaint calls. Prior to the most recent storm Pepco began cross-training many of its employees so that, for example, administrative workers could transfer to call-center service during crises. Nonetheless, the communications challenge remained immense. For example, during the July 25, 2010 storm, the number of telephone calls to Pepco seeking information or reporting problems reached 156,212 during the peak call volume day. No utility can afford to maintain a reserve of employees, even assuming multiple job skills on the part of those employees, adequate to deal on a human-to-human basis with such a spike in volume. One solution, albeit perhaps not the most desirable from a customer standpoint, exists in the form of automatic answering, processing, display and (importantly) customer-feedback telephone response systems. Pepco already employs one such system—however, from a customer perspective its software, the quality of the information provided, and its capacity have consistently been proven to be badly flawed.

Communication deficiencies (under all circumstances) will require substantial improvement if the dissatisfaction evidenced in the Work Group's interactions with residents and local businesses is to be remedied. Obviously, improved system performance will in itself greatly alleviate this concern.

Figure 13 - Policy Choices Preferred by Residential Survey Respondents



Findings

Contained in this report are a number of observations based on the Work Group's investigations. Fifteen of these findings are cited in this Executive Summary as being of primary importance. They are as follows.

1. Pepco's performance during Non-Major Event circumstances as well as during Major Events has been inferior by virtually any reasonable standard and clearly so by collective standards. This condition has prevailed for a number of years.
2. There have been repeated warnings based on consultant and post-storm assessment reports including Pepco's own data, of the inadequacy of service from a technical standpoint as well as from a management and customer relations standpoint. The most important of these warnings appear to have been downplayed, excused, or ignored.
3. Reliability during Non-Major Events has suffered primarily from inattention to, underinvestment in, and lack of long-term planning for, the basic power distribution infrastructure.

4. Reliability during Major Events has suffered primarily from inattention to, and underinvestment in, vegetation management—aggravated by inadequate system maintenance.
5. Pepco's ability to effectively assess operating status and recovery time remains technologically dated, and restoration of power following major outages appears to have lagged industry experience.
6. Nearly 95 percent of the respondents to the Work Group's online survey stated that during the past year they had experienced at least one outage that lasted longer than five hours. The majority of the respondents reported that the outage(s) caused them to suffer an economic cost. About half of those participating in the survey indicated that they had experienced at least one outage of one hour or longer during the past year under benign weather conditions.
7. Data relating to Pepco's outages and their cause is fraught with a lack of accepted standards, confusing entries, vague categorizations and questionable definitions—making it extremely difficult to prioritize or even identify appropriate corrective actions.
8. There is little connection between PHI profitability and Pepco's quality of service. This is suggestive of the lack of a market driver to increase reliability.
9. The PSC has not implemented economic incentives sufficient to replace those present in a competitive market as opposed to the monopoly conditions under which Pepco operates.
10. The economic cost to the Montgomery County community, both family and business, of inferior electric utility performance has been substantial and adversely affects Montgomery County's attractiveness as a place to live and locate firms and the jobs they create. This cost has not been placed in perspective with the much lesser cost, albeit substantial, estimated to significantly improve Pepco's service.
11. The public health and safety impact, as well as general inconvenience, to Montgomery County residents due to power outages, particularly during Major-Storm Events, compounds the purely economic consequences.
12. Pepco and its partner crews have worked safely over extended periods of time in very adverse conditions while responding to outages.
13. Montgomery County and other government agencies (e.g. municipalities) have given Pepco insufficient authority and clarity of guidance regarding the removal of vegetation on private property in cases where such vegetation is a threat to the provision of electric power to the community.
14. Montgomery County government support of the community during major outages has suffered as a result of Pepco's inability to provide public safety officials with timely and detailed information on the location, character and probable duration of outages.
15. Budget decisions by the State have not given sufficient consideration to the staffing needs of the PSC if it is effectively to oversee Pepco's performance and assign appropriate consequences for poor service.

Principal Recommendations

The Work Group offers the following eight *principal* recommendations that, if implemented, can be expected to substantially improve, over time, electric power transmission and distribution service rendered by Pepco within Montgomery County. These recommendations are augmented by a number of more specific recommendations contained in the body of the report.

1. Pepco should adopt, fund and *execute* a multi-year plan for system inspection, maintenance and enhancement that, with appropriate measures of results, will replace its current largely reactive process of responding to failures and to public scrutiny. Pepco's proposed Six-Point Reliability Enhancement Plan, while constructive, falls short of meeting this requirement in both scope and urgency.
2. Pepco should make the investment necessary to modernize its capability to monitor system status, particularly during severe outages.
3. Pepco should be measured against publicly-disclosed best-in-class performance and it should adopt industry best practices and proactively seek continual improvement.
4. Pepco should upgrade both its human and automated processes for providing timely and accurate information to customers and government representatives during both Major and Non-Major Event conditions.
5. Pepco should implement processes and procedures to assure that sufficient personnel (employees and contractors) are available to successfully undertake all preventative maintenance necessary to assure reliable electric service on an ongoing basis and to restore service in a timely manner during outages. In addition, Montgomery County and other local governments should work with Pepco to provide the authority needed to implement more effective vegetation management programs while balancing, insofar as practicable, individual customer desires regarding vegetation appearance.
6. PHI should establish an ombudsman activity relating to Pepco and reporting directly to the Chairman and CEO of PHI to help create a more customer-oriented culture.
7. The PSC should establish stringent standards and utilize its authority to impose remedies sufficient to align Pepco's financial interests with the interests of the community.
8. The State should review the human resources currently available to the PSC to assure that they are adequate in magnitude and special expertise to properly oversee Pepco operations, particularly if a strong incentive reward/penalty process as is recommended.

While much needs to be accomplished, largely by Pepco itself, the single most important action that can be taken by those outside the company is to establish a package of aggressive financial incentives and consequences that better align Pepco's priorities with those of the community.

Some have argued that the appropriate consequence for a history of poor performance is to replace Pepco. While this may be a possible course of action, a more promising avenue is to try to help Pepco succeed. The Work Group recognizes that it is more difficult to discipline a company when there are no ready replacements. The PSC has requested input on this topic as part of proceeding 9240, but the question of whether and how to replace Pepco is beyond the scope of the Work Group's charter.

Concluding Remarks

Concern over the generally substandard electric service now being provided by Pepco to the residents and businesses of Montgomery County is magnified by projections of many experts that increasingly severe weather is likely to be experienced in the years ahead. In addition, it cannot go unrecognized that the Washington, D.C. area, including parts of Montgomery County, is a particularly attractive target for terrorist activity.

It has been noted that the power distribution shortcomings that have been and are being experienced are largely attributable to prolonged neglect. The problems that have evolved took years to create and unfortunately they will take years to fully resolve. This implies that were a major storm to strike Montgomery County a year from now, the outcome could not be expected to be substantially different from previous such encounters. Nor should day-to-day performance be expected to improve markedly in the near term. However, important enhancements can and should be made on an expedited basis and there is no reason why Pepco's performance cannot ultimately approach best-in-class status. This will require adequate investment in funds and human resources and a true commitment to excellence on the part of Pepco. The residents of this extraordinary community in which to live and work deserve no less.

Acknowledgement

The Work Group especially would like to thank the staff of Montgomery County for its professionalism and dedication in assisting in the conduct of this review. We would also like to acknowledge the contributions of all those who appeared before us at our various meetings, and thank those from Pepco who provided information utilized in our efforts. The findings and recommendations contained herein are nonetheless entirely those of the Work Group itself and as such represent our views.

While our efforts were on occasion hindered by alleged confidentiality of information and the fact that formal regulatory proceedings were occurring in parallel with our work, we nonetheless believe that the evidence available, certainly in the aggregate, is more than sufficient to substantiate the recommendations offered herein.

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2—NON-MAJOR EVENT RELATED OUTAGES

2.1 BACKGROUND

2.1.1 PURPOSE

This Chapter provides an overview of Pepco's performance related to outages that occur during Non-Major Events. These outages include those occurring during "blue sky"[4] conditions and minor storms. This Chapter also provides a series of recommendations that can result in lower overall outage rates and faster restoration times for Montgomery County customers. Furthermore, because weaknesses in infrastructure are more closely tied to Non-Major Event outages than those of Major Events, this Chapter identifies areas where infrastructure can and should be improved to result in a higher level of day-to-day reliability.

2.2 FINDINGS

Pepco's performance under both Non-Major Event conditions and during Major Events can be judged inferior by any reasonable standard and clearly so by a collective set of standards. This condition has persisted since 2005.

Pepco's reliability during Non-Major Events has suffered primarily from inattention to long-term planning and underinvestment in the utility's electricity distribution infrastructure.

Pepco's infrastructure significantly underperforms due to the lack of a proactive preventive maintenance program including the identification of critical maintenance practices, effective record keeping, and continual improvement. This approach allows similar failures to occur, and reoccur, over multi-year periods.

Much of Pepco's system that is served by Underground Residential Distribution (URD) cables is nearing the end of its reliable service life and there is no long term plan for assaying the condition of the system, nor a plan for its replacement.

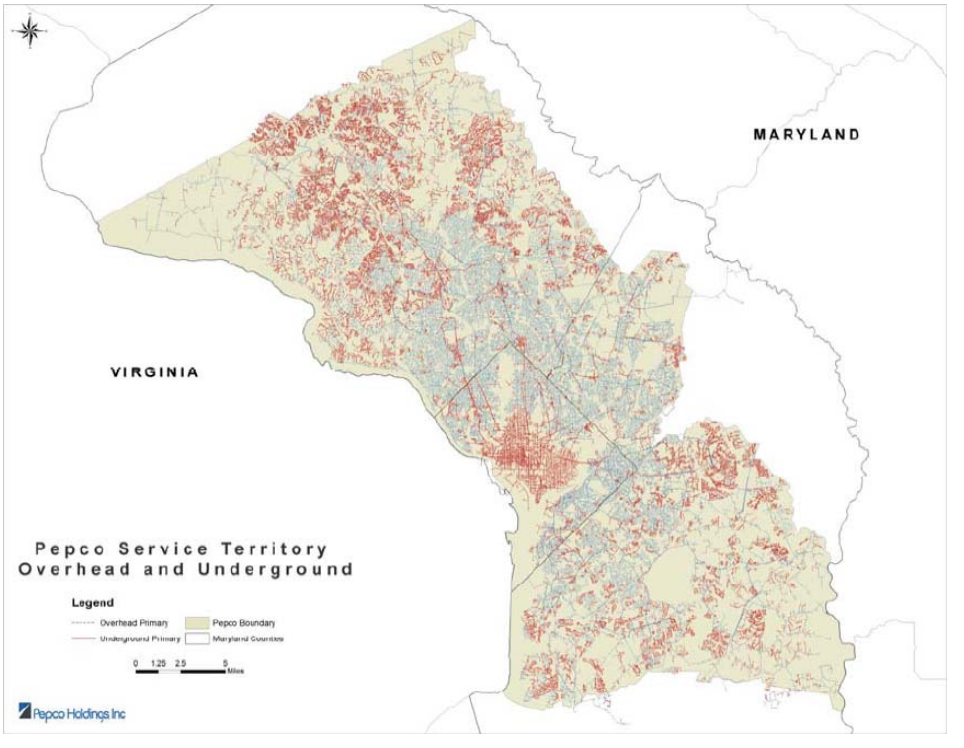
Pepco's ability to assess system operating status is technologically out-of-date and depends heavily on customer reporting.

[4] "Blue sky" refers to fair weather conditions.

2.2.1 OVERVIEW OF PEPCO DISTRIBUTION SYSTEM

Pepco provides electric service for 280,945 residential and 26,660 commercial customers in Montgomery County[5]. The geographical layout of underground and overhead lines in the Pepco system are shown in Figure 14.

Figure 14 – Pepco's Maryland Territory Showing both Underground and Overhead Lines



The Pepco distribution system is organized by separate voltage levels as follows[6]:

- Sub-transmission operates at 69 kV and 34 kV and is the first step from the regional transmission backbone into the Pepco Distribution System.
- Sub-transmission is stepped down at substation to 13 kV for distribution into neighborhoods.
- Lateral fused circuits protect individual developments or feeders.

[5] According to Pepco's response to MC Data Request 6, Q2, Pepco has a total of 787,063 customers system-wide. In the Pepco Reliability Enhancement Plan – Montgomery County, Page 5, however, the Plan states that "Pepco delivers electricity to more than 781,000 customers in major portions of Montgomery and Prince George's counties in suburban Maryland and in the District of Columbia."

[6] First Quartile and Silverpoint Report to the PSC, Page 7.

- Pole or ground mounted transformers step the power from 13 kV down to 460, 240, or 120 Volts for delivery to homes and businesses.

- The design is radial loop, with redundant distribution feeders for most customers. The redundancy is via manual dispatching and switching.

- Pepco has full Supervisory Control and Data Acquisition (SCADA; two way communications and remote control capability) at the substation and distribution substations that is superior to the general norm.

- The system operates at N+1 redundancy, which is the industry standard, and N+2 under normal loading. N+1 redundancy means that under system peak conditions a substation can lose a transformer and its associated supply feeder and still adequately supply all load[7].

- In Montgomery County, there are 4,715 miles of overhead line, 6,547 miles of underground line, and 34 distribution substations[8].

- Approximately 10 percent of poles carrying Pepco power on above ground 13 kV circuits are owned by telecommunication companies.

- Redundant lines feeding Pepco's transmission substation give this element of the system satisfactory reliability.

The performance of this infrastructure is dependent on appropriate upgrading, reinforcing, and maintenance. The system has several fundamental weaknesses that may contribute to slow restoration times. For example, running sub-transmission and distribution circuits on the same poles makes the system vulnerable to having both circuits taken out by a single tree. Another example is that some switches are manually rather than remotely operated. Remotely controlled switches do not require crews to be dispatched into the field to reset the circuit and thereby reduce restoration times.

Running sub-transmission and distribution lines on the same poles is another weakness which makes the system vulnerable to having both circuits interrupted by a single vegetation impact. Another is that although the radial loop design creates redundant circuit paths to reduce restoration times, the tie between most of these paths is usually in the "open" position; i.e., the circuits are not ordinarily connected and the switches are manually rather than remotely operated. In the event of an outage on one line, a crew is dispatched to manually operate the switch to restore power via the redundant line. This typically takes 15 to 30 minutes or more. Restoration times could be reduced by employing more remotely-activated switches that do not necessitate the dispatch of a new.

2.2.2 PEPCO NON-MAJOR EVENT RELIABILITY

Starting in 2003 to 2004, Pepco's performance in Non-Major Events started to decline compared to its nearest regional peers (BGE and Allegheny Power) (Figures 15 and 16). It is difficult to assign cause to this decline. As noted by the PSC Consultants, latent damage sustained during

[7] First Quartile and Silverpoint Report to the PSC, Page 9.
[8] MC Data Request 1, Q2.

Hurricane Isabel might have been a contributing factor[9]. Further, deregulation, which required extensive restructuring of the utility from a provider of generation, transmission, distribution to a provider of transmission and distribution with an energy services subsidiary, was implemented during this timeframe. However, neither of these factors serves as a justification as they should have been diagnosed and remedied.

Figure 15 – Reliability of Maryland Utilities Serving Montgomery County (2000 - 2009) – SAIFI, excluding Major Events

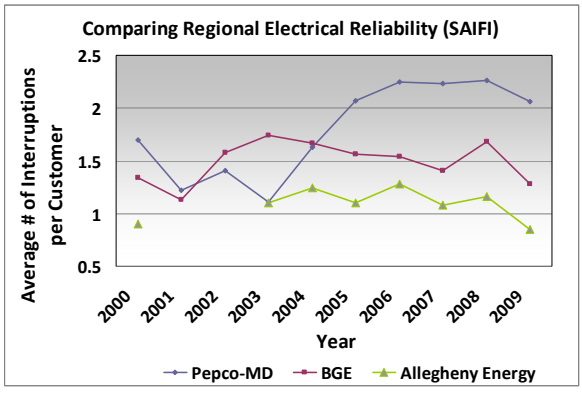
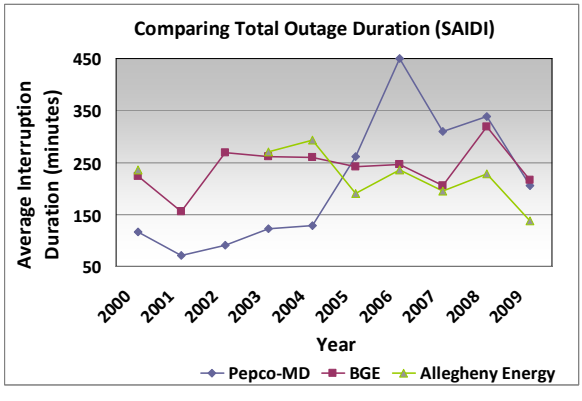


Figure 16 – Average Outage Durations of Maryland Utilities Serving Montgomery County (2000 - 2009) – SAIDI, excluding Major Events



2.2.3 PERFORMANCE OF WORST FEEDERS

Pepco identifies annually the two percent worst performing electrical circuits on its system[10]. This equates to fourteen circuits. Pepco analyzes these circuits and the causes of outages and failures, then reacts by developing and implementing a corrective action plan for each circuit[11].

[9] First Quartile and Silverpoint Report to the PSC, Page 15.
[10] Note: "Feeder" and "circuit" are used interchangeably.
[11] See COMAR 20.50.

A review of the two-percent worst performing circuits for the periods 2006-2010 shows that the circuits are predominantly overhead. The causes of the Non-Major Event outages include equipment failure, tree contact, weather, animal contact, unknown cause, and other. "Other" can generally be dismissed in the specific case of Non-Major Event outages as it is a minor fraction of outage causes and the causes are generally not pernicious (e.g., contractor digging on line, equipment hit by automobile, etc.) (Figure 17).

For the period of October 1, 2008 through September 30, 2009, eight of Pepco's fourteen worst performing feeders were in Montgomery County. By Pepco's reports this amounted to 106,987 customers (out of 525,876 Maryland customers in 2009[12]) being out of service for a total of 144,415 hours. For the period of October 1, 2009 through September 30, 2010, eleven of the fourteen worst performing feeders were in Montgomery County. By Pepco's report this amounted to 87,857 customers being out of service for a total of 226,677 hours.

Thus in 2010, there were three more worst performing circuits, 19,130 fewer customers affected but 82,262 additional hours of outage time than in 2009. The average outage time increased from 1.4 hours in 2009 to 2.6 hours in 2010.

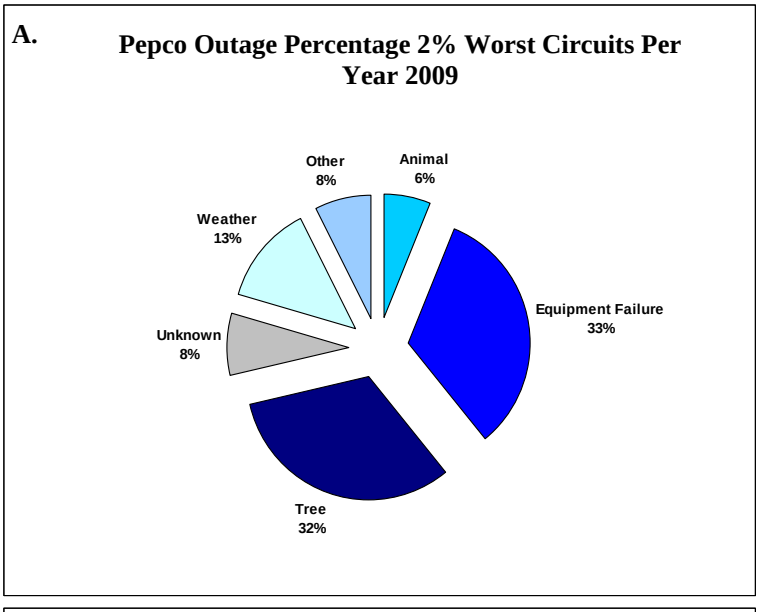
Of particular concern are reports that indicate that several circuits have appeared on the underperforming list more than once in the last four years. These circuits include #15127 (Norbeck) three times, #15129 (Norbeck) two times, #15030 (Colesville) two times, #15235 (Quince Orchard) two times[13]. In some cases, these circuits appear on the Worst Feeder list in consecutive years and in other cases they dropped off the list the following year only to subsequently reappear on the list. This would indicate both that the promptness and quality of the corrective actions were insufficient to promote the necessary performance improvement.

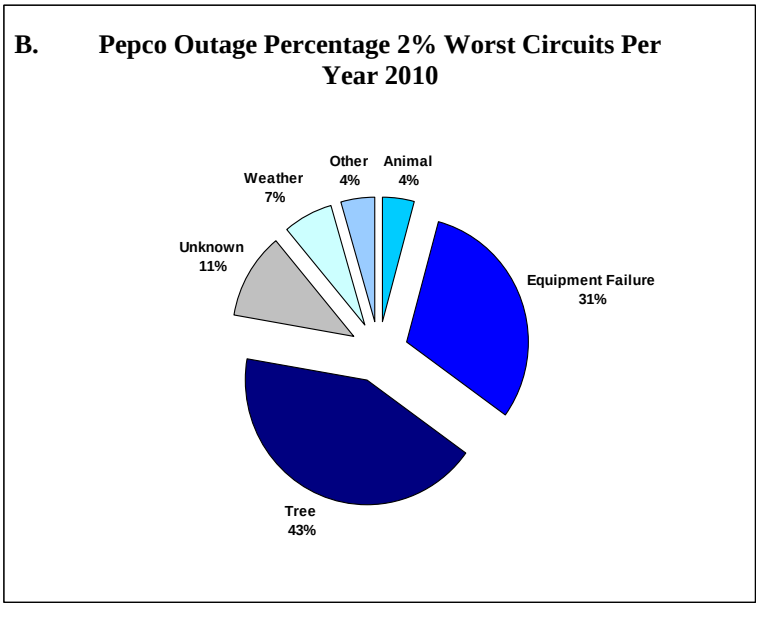
Once a feeder appears on the Worst Performing Feeder list, it often takes Pepco several years to implement a corrective action plan that addresses the root causes of the poor performance. This finding is supported by the PSC Consultants' Report[14]:

> *On Pepco's sub-transmission and distribution lines, repairs often happen by chance, not by procedure. In that context, frequent outages are no surprise.*[21]
>
> *Pepco's piecemeal approach to dealing with its reliability issues has, at least until recently, been reactive rather than proactive. Pepco's monthly management reliability reports track Maryland and District of Columbia results separately, as they should, since these systems, and their vulnerabilities, are markedly different.*[22] *Even so, it appeared to us that until recently Pepco's senior management was not focused on designing initiatives specifically targeted to restoring reliability for Montgomery County and Prince George's County customers.*

[12] MC Data Request 6, Q2.
[13] MC Data Request 4, Q13 & Order No. 83552, Q19.
[14] First Quartile and Silverpoint Report to the PSC, Page 15. Note: Citations in block quote are to the PSC Consultants' Report.

Figure 17 – Pepco Two percent Worst-Circuit Outage Causes – 2009 (A) and 2010 (B) Excluding Major Events[15]





[15] MC Data Request 4, Q13.

This conclusion is indicative of a failure in the ability of the utility to maintain management practices focused on continual self-evaluation, measurement of performance, and remedial action. Figure 18 illustrates other areas, derived from data requests posed to Pepco, where evidence of a management system was lacking. In light of Pepco currently not having data available to track the age and condition of its system, it would be a good practice for the Pepco to institute a regular inspection program to identify equipment in need of repair or replacement and to address ongoing tree clearance issues.

Figure 18 - Key Infrastructure and Operational Activities Not Tracked or Readily Available

Question	Pepco Response	Conclusion	Reference
What are the performance targets in Outage Management System (OMS)?	No performance targets for major events due to unique nature of severe weather events.	Storm scenarios are close enough to establish basic performance targets for the OMS in routing restoration.	MC Data Request 4, Q7D
Describe changes to staffing procedure or levels since Winter of 2010 and how the effectiveness is measured.	The effectiveness of these changes will be measured by improvements to customer feedback.	Pepco proposes measurement by customer feedback (e.g., complaint based), but not a process to set and measure internal benchmarks and proactive monitoring.	MC Data Request 4, Q9
What are the ages of the wires on two percent worst feeders for 2008, 2009, and 2010?	Information not available.	Because this information is not tracked, appropriate maintenance and replacement intervals cannot be implemented.	MC Data Request 4, Q13H
What are the ages of transformers on the two percent worst feeders for 2008, 2009, and 2010?	Information not available.	Because this information is not tracked, appropriate maintenance and replacement intervals cannot be implemented.	MC Data Request 4, Q13H
What is the average age of a transformer on Pepco's System?	Average age of transformers on Pepco's system not known.	Because this information is not tracked, appropriate maintenance and replacement intervals cannot be implemented.	MC Data Request 4, Q17C
What is the age of Underground Cable on the two percent worst performing feeders for 2008, 2009, and 2010?	Data not available.	Data not available.	MC Data Request 4, Q18C
What percentage of lines in the Pepco Maryland Region Currently have lightning arrestors? What is the failure rate?	All (100 percent) of the feeders have lightning arrestors, the failure rate is not known. *Note: The 2010 Reliability Plan indicates replacement lightning arrestors as part of the reliability improvements.*	If the failure rate is not known it is not being tracked or inspected. It is not clear why Pepco would request funds for lightning arrestors if they are deployed on 100 percent of circuits and the failure rate is unknown/un-quantified. Indicates gap in communication/prioritization, planning and analysis of key failure points and infrastructure age.	MC Data Request 4, Q23

2.2.4 SUBSTATION PERFORMANCE

A number of substations have multiple underperforming circuits. These include Quince Orchard (five circuits), Wood Acres (five circuits), Norbeck (four circuits), Beverly Farms (four circuits), Kensington (three circuits), Linden Lane (three circuits) Colesville (two circuits) Potomac (two circuits), Grant Avenue (two circuits), Bureau of Standards (two circuits), and Bethesda (two circuits)[16]. This poor performance leads to significant outages in a given geographic outages (i.e., area around a particular substation).

Pepco developed a 2010 Reliability Enhancement Plan for 115 feeders in Montgomery County. This plan was developed based on data collected through September 30, 2009. The plan identifies:

- **Twenty-nine of these circuits for priority feeder work** (determined by Pepco to be the worst performing feeders). Pepco then identified improvements that needed to be made to improve performance. These improvements included replacement of equipment (poles, cross-arms, insulators) and wire, the installation of sectionalizing fuses, the installation of animal guards and the replacement of blown lightning arrestors.

- **Twenty-nine of the feeders for vegetative management**.

- **Twenty-one circuits for Underground Residential Distribution (URD) cable replacement**. This effort replaces underground cable that was typically installed in the 1970s and is experiencing higher than normal rates of failure. These URD cable replacements normally impact a neighborhood (i.e., 50 to 300 homes) and not the entire circuit of approximately 1,100 customers.

- **Nineteen circuits as needing upgrades to address an increase in load**.

- **Seventeen circuits for improvements with distribution automation equipment**. These enhancements will necessarily better identify faults when they occur and perform automated switching.

Unfortunately, the implementation of the 2010 component of the Five-Year, Six-Point Reliability Enhancement Plan has not been completed and, therefore, its full effect on the overall system performance cannot be assessed. However, to the Work Group's knowledge, Pepco has not developed any means to measure the outcomes of its plan as it is implemented. This concern is supported by the PSC Consultants' Report[17]. Further, this plan does not address all of the feeders in the Pepco system nor does it institutionalize the plans and process to review infrastructure and implement the necessary long-term corrective actions.

Multiple circuit failures from a given substation results in:

- More customers being affected in a wider geographic area than if only one circuit fails from a particular substation.

[16] MC Data Request 4, Q13A and Order No. 83552, Q19. Does not include feeder 15129 as data was not available.
[17] First Quartile and Silverpoint Report to the PSC, Page 57-58.

- A systemic problem related to similar circuitry and/or types of outages in a geographic area.

While it is common industry practice to prepare contingency plans for loss of a single component of the system (called N+1), plans for multiple failures are generally not prepared because of the large number of potential combinations. Therefore, in Pepco's system design, chronically failing feeders can lead to multiple circuit failures that cause greater restoration times and number of total outages.

2.2.5 UNDERGROUND RESIDENTIAL DISTRIBUTION (URD)

The installation of URD cable did not begin until the late 1960s as technology advanced to allow a relatively simple and inexpensive form of high-voltage underground wire to be installed in new residential neighborhoods. Then, in 1969, the Maryland PSC issued an order that required the installation of underground lines in all new residential neighborhoods. Thus, most URD cable has been installed since 1970. While Pepco insists that URD cable has a life expectancy of forty years, Pepco has had to replace many miles of cable prior to the passage of 40 years.

It should be noted that Pepco has replaced approximately 25 miles of underground residential distribution (URD) cable in residential neighborhoods since September 2010. This work was completed or is on-going in 15 Montgomery County neighborhoods. Approximately 1,200 of the 5,100 total miles of URD in Pepco's system are over 30 years old[18]. While Pepco's replacement efforts represent a start, the program is inadequate because the replacements are done based on cable faults and there is little evidence of a proactive inspection. As stated by Pepco[19]:

> *Identification of areas for replacement or upgrade of URD cable is based on the number of cable faults and equipment failures within the 2 year period as well as the number of customers affected.*

URD should be part of the overall improved inspection and maintenance program recommended in Section 2.2.6.

2.2.6 OPERATIONS AND MAINTENANCE (O&M)

Investments in operations and maintenance are intrinsically linked to system reliability. Maintenance expenditures over the prior five years have often been insufficient to enhance or even maintain the existing infrastructure in terms of reliability.

As an aspect of Pepco's discretionary funding, O&M budgets are not subject to or review as part of rate-making, nor annual reliability reporting. The PSC Consultants' Report states[20]:

[18] MC Data Request 4, Q18A.
[19] MC Data Request 4, Q18B.
[20] First Quartile and Silverpoint Report to the PSC, Page 49. Note: Citations in block quote are to the PSC Consultants' Report.

All O&M expense is considered discretionary for budget purposes.[82] *That is not unique to Pepco. When utilities are faced with unexpected non-discretionary capital projects, they often turn to O&M dollars as a way to fund those projects.*

We could not estimate to what extent the Company under-spent in the last five years on its planned total O&M expense, let alone its reliability-related O&M expense. The Company indicated that it does not prepare five-year O&M budgets, and so could not provide us original budgets for these years.[83] *Similarly, we requested a five year O&M expense budget for 2011 to 2015. Pepco reiterated that it does not prepare five-year O&M budgets, stating that it develops its budget on an annual basis. For whatever reason, it failed to even provide the current O&M expense budget for 2011.*[84]

As noted in the PSC Consultants' Report[21]:

Since Pepco does not conduct regular inspections of its sub-transmission and distribution lines, it is not in full compliance with COMAR, which specifies NESC [National Electric Safety Code] *requirements for routine inspections and follow-up maintenance. Although Pepco has no formal circuit inspection it does bring poles and the equipment on them up to NESC code when it works on them.*

With regard to substation maintenance, the PSC Consultants' Report concluded[22]:

We saw no real weaknesses in the Company's inspection and maintenance practices in substations

However, the Work Group notes the occurrence of several substation failures in Montgomery County over the last year during Major Events. These incidents call into question the substation maintenance process and likely warrant further investigation as to root causes, risk of similar occurrences at other substations, and implications for ongoing substation maintenance.

In conclusion, Pepco takes a primarily reactive, not proactive, approach to the operation and maintenance of its electric system. This approach allows failures to occur and then Pepco responds. Pepco's response often takes many months or even years to implement.

2.2.7 KEY INFRASTRUCTURE IMPROVEMENTS

Pepco has frequently touted its Reliability Enhancement Plan as a rapid response to a deteriorating system. However, the Work Group concurs with the recommendations of the PSC Consultants' Report[23]:

Pepco expects to spend approximately $275 million in the next five years on its Reliability Enhancement Plan. The Company cobbled together the plan in one month's time; it is a combination of new projects and old discretionary projects that were never fully funded. Pepco acknowledged that it does not know whether the plan will actually achieve its goals, as it did not perform reliability improvement analyses. With this ready-

[21] First Quartile and Silverpoint Report to the PSC, Page 51.
[22] First Quartile and Silverpoint Report to the PSC, Page 51.
[23] First Quartile and Silverpoint Report to the PSC, Page 57.

shoot-aim approach, a portion of the Company's planned capital spending is almost certainly poorly targeted.

The plan contains improvements that are not necessarily inappropriate or will not to some degree enhance reliability, but there is no clear analysis or understanding as to whether this plan can actually achieve its goals, much less meet customer expectations for reliability. However, the Work Group does agree that several key pieces of infrastructure, highlighted in the Reliability Enhancement Plan warrant pursuit.

Automatic Reclosers

Automatic reclosers sense a fault condition, which is a short circuit caused by vegetation, animal contact, equipment failures, or other factors. The recloser automatically opens the circuit momentarily, allowing time for the fault to clear (e.g., momentary contact with vegetation) then automatically re-closes, thereby restoring power. If the fault remains, the recloser reopens momentarily and then closes again, it repeats this sequence two or three times, then remains open if the fault appears to be permanent. The device automatically restores power to the unaffected part of the circuit and prevents the disturbance from moving away from the source. This prevents the fault from triggering other system protections and exacerbating the number of customers suffering outages.

Currently, Pepco has 750 distribution circuits at the 13kV level, but only 60 to 65 reclosers installed. Pepco installed 20 automatic circuit reclosers on feeders on its two percent worst performing circuits from 2005 to 2010. These were added only on the trunk lines; manual fuses remain in place on lateral lines.

Pepco uses the following criteria to determine if automatic recloser or switch installation is warranted: greater than those in the case of mainline faults with sustained feeder outages over a two-year period; corrective action is to install automatic reclosers or automatic switches; devices must be located greater than one-half mile from substation. However, newer recloser technology can allow the devices to be placed closer to the substation expanding their applicability.

As part of Pepco's Five-Year, Six-Point Reliability Plan, the company intends to install about 30 new automatic reclosers in Montgomery County.

Reclosers should in fact be installed judiciously, and only as part of a comprehensive improvement effort with continued maintenance and monitoring of system improvement. When there are multiple simultaneous outages on a system with multiple weaknesses, the reclosers may revert to manual mode negating their benefit and requiring a manual reset. It is difficult for Pepco to install reclosers in its system due to the high-fault-current requirement that is potentially damaging to circuit breakers so unless more extensive issues are remedied, the results may be disappointing.

Fuses

Lateral circuits branching from the main radial distribution line have manual fuses that cannot be reset remotely. Each failure of a switch must be attended to by a line worker, greatly extending the time to restore power.

The PSC Consultants' Report states that[24]:

> *Improved switching capabilities will have a positive impact on the Company's reliability metrics. Pepco plans to install new automated recloser schemes on its distribution system as part of its two percent worst feeder program and its Reliability Enhancement Plan. The Company should also analyze the benefit of adding switching capability to improve its reliability under blue sky, minor storm, and major storm conditions, and prioritize its spending accordingly. For example, automation capability on distribution tie switches is less useful during major events such as the storms of 2010 as it typically shuts down during widespread outages.*

This prudent deployment can only come as part of a carefully planned refit.

Arrestors

Lightning arrestors are protective devices that divert the power surge in the line induced by a direct or nearby lightning strike out of the line to the ground and prevent it from moving along the line to where it can trigger protective mechanisms that tentatively remove the circuit from service (create an outage), or pose a threat to people or equipment.

Lightning arrestors are a long-standing staple of utilities and can be considered common practice. Pepco reports that its system includes 100 percent coverage on lines. The life of the equipment is approximately 30 years, and Pepco reports that the failure rate is unknown. However, the PSC Consultants' Report notes numerous instances where lightning arrestors were blown[25]. Similarly, the Pepco Reliability Enhancement Plan notes that its priority feeder program seeks to identify and correct poorly performing feeders including replacing lightning arrestors[26]. This is a prime example of how a proactive preventative maintenance program could identify issues before the problem emerges instead of responding to failure.

Voltage Management and Monitoring

Voltage quality on feeders decreases, barring any correction, the further away a customer is located from the distribution substation to the point where the level may be outside of accepted American National Standards Institute (ANSI) specification and cannot meet the customer's needs. Pepco uses modeling software to calculate the voltage at the pole or pad mounted at the transformer site to see if the equipment maintains the proper voltage level. These voltage drops are evaluated on a two-year cycle and Pepco will soon be using a new three-phase power flow software package that calculates the circuit voltage. This will be evaluated in the next year, which should help enhance Pepco's data to make system improvements. Pepco stated[27]:

> *Pepco evaluates feeder voltage drops on a two-year cycle. Pepco has recently upgraded to a three-phase power flow software package that calculates the circuit voltage to the primary of each of the customer transformers. Approximately half of the Maryland*

[24] First Quartile and Silverpoint Report to the PSC, Page 19.
[25] First Quartile and Silverpoint Report to the PSC, Page 51.
[26] Pepco Reliability Enhancement Plan - Montgomery County, Page 8.
[27] MC Data Request 4, Q22A.

circuits have been studied using this software package. The rest will be studied using the upgraded software package over the next year.

The Work Group views the above strategies as reasonable but encourages Pepco to conduct further data analyses to ascertain whether its corrective actions are having the intended impact on performance.

Selective Undergrounding

Pepco has endorsed selective undergrounding under certain circumstances. In its Reliability Enhancement Plan, Pepco stated[28]:

> *As Pepco evaluates the performance of individual feeders, the need to perform more aggressive modification to the system is identified. This approach to improving reliability has produced significant benefits, but, in some cases, still has not achieved the needed level of reliability. In these limited areas that traditional modifications on the overhead system have not produced desired results, we will evaluate the possibility of selectively replacing the overhead system with an underground system.*

Pepco plans call for spending approximately $75 million over five years to conduct selective undergrounding[29]. While nearly 30 percent of its proposed Reliability Enhancement Plan is dedicated to this activity, no new or selective undergrounding has been conducted to date. However, preliminary engineering studies relating to these projects have begun[30]

2.2.8 ADVANCED DISTRIBUTION TECHNOLOGY

A key component of Pepco's plans to enhance reliability is the inclusion of several new programs that, according to Pepco, will reduce long-term stress on the system, enable greater control of utility assets, implement automate outage reporting, and provide additional data that can be used to diagnose system problems and patterns.

The need for Pepco to identify and adopt advanced technologies has been a subject of scrutiny by the County and community for several years. In 2009, the Montgomery County Sustainability Working Group (SWG), which included a Pepco representative, concluded[31]:

> *The majority of residential and small commercial meters in the community are dated analog designs not significantly different than meters installed before the Second World War. Some other utility infrastructure is similarly dated. The consequences of this are substantial, including a track record of intermittent failures and power quality problems in some neighborhoods in the County. While isolated upgrades and improved maintenance have helped mitigate some of these problems, the only way to address the root cause is a comprehensive upgrade of the electric distribution system, starting with the meter.*

[28] See Pepco Reliability Enhancement Plan.
[29] See Pepco Reliability Enhancement Plan Press Release, http://www.pepco.com/welcome/news/releases/archives/2010/article.aspx?cid=1523.
[30] See Pepco Reliability Enhancement Plan Update. (March 2011).
[31] Montgomery County Climate Protection Plan. (2009). Recommendation EER-6 http://www.montgomerycountymd.gov/content/dep/downloads/2009mococlimprotplan.pdf.

The scope of the SWG's investigation was broad and focused on the environmental benefits of grid modernization. However, the basic findings of the SWG regarding infrastructure are consistent with the findings of the Work Group.

Advanced Metering Infrastructure (AMI)

Pepco is currently undertaking an effort to replace 570,000 meters in Maryland with advanced digital meters known as AMI capable of two-way communication between the customer's location and the utility. In terms of reliability, these "smart meters" enable automated reporting of outages by providing a signal when the meter has power. The absence of a signal can be incorporated into Pepco's Outage Management System (OMS) to enable the utility to identify residents without power without necessitating their calling Pepco. Similarly, this allows Pepco to identify "nested outages," where a feeder may be re-energized and deemed restored but a few properties remain without power due to a secondary cause.

AMI also allows customers to participate in time-of-use rate plans that price power at a premium during periods of high demand, thereby enticing consumers to conserve. This can reduce system stress that can lead to load related outages and equipment damage. Further, AMI all but eliminates the need for manual meter reading.

While AMI presents a powerful tool to help utilities manage a variety of factors, Pepco should be cautioned not to over-rely on this technology as a replacement for sound management practices and proactive analyses. AMI can help increase utility situational awareness of the scope of an outage and help restore power. However, this data cannot be translated into useful information unless a firm linkage is made with the OMS. Similarly, the load control benefits of peak pricing cannot solely be viewed as a proxy for sound upgrading and proactive maintenance of utility infrastructure.

Demand Response and Direct Load Control Programs (DR/DLC)

Pepco has recently re-established Direct Load Control (DLC) programs which provide incentives to consumers who allow certain key pieces of equipment to be "cycled" during periods of high demand. For example, smart thermostats currently installed in resident's homes can change thermostat settings reducing demand during peak periods. Similar to peak pricing programs, these approaches reduce demand during periods of short supply and can help reduce load related outages and equipment damage while reducing the customer's electric bill. While the impact of DLC programs on overall reliability on days where energy supply is adequate is not certain, Pepco has had significant problems with the development and deployment of this program. Specifically, the equipment selected by Pepco, a White and Rodgers thermostat, developed a condition where battery leakage into the circuit board could cause a fire. The PSC, as a remedy to the latter, stayed the program.

Primary Causes of Non-Major Event Outages

The PSC Consultants' Report asserts that the causes of the outages during the 2010 storm events (vegetation management) should serve as a proxy for the utility's everyday reliability issues[32]. The Work Group disagrees. The Consultants' Report provides no justification for this assertion.

[32] First Quartile and Silverpoint Report to the PSC, Page 22.

Based upon data from the worst performing circuits (Figure 17), equipment failure may be just as important or more important than vegetation management as a major cause of outages in Non-Major Event situations. The Work Group agrees with the Consultants' Report that the utility does not maintain adequate records to definitively identify the primary cause of Non-Major Event outages[33].

2.3 RECOMMENDATIONS

1. ***The Work Group supports the PSC Consultants' Report observations and recommendation (B1) that Pepco implement a rigorous, systematic, and long-term infrastructure inspection and maintenance program.***

   The program should include a complete assessment of the Pepco system, completed in no more than the next four years. The cycle should be repeated every four years thereafter to ensure continued and acceptable system reliability[34].

2. ***Pepco should institute a comprehensive process for collecting and maintaining records, and, at the discretion of the PSC, implement auditing of records by a third party auditor.***

   Pepco has a systemic deficiency in collecting and maintaining adequate records, both financial and operational, to monitor asset conditions, performance, and plans for replacement for much of its infrastructure.

3. ***Pepco should modify its O&M program from a reactive orientation to a proactive orientation that includes periodic inspection, measurement and reporting on equipment conditions, repairs made, and costs.***

   This process should be comprehensive and periodically reviewed by the PSC or a qualified third party and identified should be implemented.

4. ***The PSC should ensure that infrastructure shared between utilities (e.g., electricity, cable, telecom) is maintained to a comparable standard as non-shared equipment.***

   Approximately 10 percent of Pepco's 13 kV lines, some of the most vulnerable in terms of span and operations, are carried on poles owned by telecom companies. The PSC Consultants' Report concluded that while Pepco inspects poles every 12 to 18 years, the newest inspection tag noted on a telecom pole was 20 years old[35].

5. ***Pepco should further investigate records of incidents of substation failure in its Quince Orchard and Kensington substations to assess whether improved maintenance protocols and practices could have prevented the failures.***

[33] First Quartile and Silverpoint Report to the PSC, Page 15.
[34] First Quartile and Silverpoint Report to the PSC, Page 57.
[35] First Quartile and Silverpoint Report to the PSC, Page 52.

An investigation of the cause of the Kensington Substation failure was traced to a failure in the battery system. Pepco, as quoted in the media, stated that "the age and condition of the battery could have played a role in the failure"[36]. A comprehensive maintenance and inspection program might have identified and prevented this system failure.

6. ***Pepco should conduct a transparent analysis for selective undergrounding to include the weighting associated with corresponding feeders and transformers, relative SAIFI for corresponding feeders and transformers and presence of factors whose impact is likely to be affected by undergrounding (e.g., Urban Tree Canopy).***

   Despite repeated references to the need and effectiveness of selective undergrounding, Pepco has not implemented a single new project to harden vulnerable circuits in this manner and to test the effectiveness of this procedure.

7. ***Pepco should systematically evaluate all feeders and take appropriate corrective action to fix troubled feeders on a specific schedule and advise the PSC accordingly. Pepco and the PSC should develop a new standard that identifies a greater number of the worst performing feeders to be addressed as priorities.***

   When feeders appear on the worst performance list more than once in a five year period, which is currently not uncommon for Pepco, the firm should take immediate action. Pepco should report performance data on that feeder for each of the next five years to ensure effectiveness of the prescribed corrective action.

8. ***Pepco should establish a revised approach to underground cable replacement that focuses on assessment and evaluation rather than reactive, breakdown repair or replacement***

   Pepco's staff states that URD is scheduled for replacement based on the number of failures and complaints, with no evidence of proactive testing, or a scheduled replacement interval.

9. ***Pepco should establish an ongoing program to conduct analyses of customer outage reports and other data as it becomes available, such as through AMI, to identify clusters that indicate local problems may exist—and then take prompt corrective action.***

   BGE has stated that a part of its reliability approach is to monitor system performance and identify areas or circuits that have chronic or recurrent problems. Pepco should implement a similar surveillance program.

10. ***Pepco should accelerate and sustain investment in equipment for better monitoring, control, and operations of the distribution system beyond the initial five- year period covered by the Reliability Enhancement Plan for the purpose of achieving a high level of long-term system reliability.***

[36] Kadylak, J. (March 28, 2011) Kensington Substation Fire Caused by Battery System Failure. *Kensington Patch*. Retrieved from http://kensington.patch.com/articles/kensington-substation-fire-caused-by-battery-system-failure.

Pepco's current Reliability Enhancement Plan proposes a number of actions, that at face value would appear to be effective and in the right circumstances can in fact be remedies for some distribution system reliability problems. However, these remedies have neither been vetted for their performance nor do benchmarks appear to have been established to monitor their overall effectiveness.

11. ***The Work Group supports the PSC Consultants' Report conclusion that Pepco should immediately comply with existing NESC standards for regular inspection and follow-up maintenance of sub-transmission and distribution lines in compliance with COMAR regulations[37].***

    Pepco acknowledges that this approach does not capture all potential issues or fully comply with NESC standards, and it is not opposed to establishing a more robust feeder inspection program[38]. Pepco should follow-up on this recommendation.

12. ***Pepco should consider initially implementing AMI technology in areas with weighted critical facilities (more rapidly within the context of its current implementation program).***

    The Working Group acknowledges that there are some logistical limitations that may affect how AMI meters are rolled out into the Community (e.g., meter density, collector location). However, Pepco has stated that it intends to deploy AMI by "following the circuit", over a multi-year period. To help enhance reliability in the short term, Pepco should install AMI in communities with critical facilities to the extent practicable. Simply stated, the customers' convenience should outweigh Pepco's convenience except when sound reasons to the contrary exist.

13. ***Pepco should integrate its Outage Management System (OMS), customer communication and AMI technology to provide customers information about outages.***

    AMI can be a powerful tool to streamline utility operations, introduce new tariff structures, and reduce costs from meter reading. However, unless it is integrated the Outage Management System in an effective and meaningful way it can neither provide data to accelerate restoration of outages nor contribute to post incident analyses.

[37] First Quartile and Silverpoint Report to the PSC, Page 51.
[38] First Quartile and Silverpoint Report to the PSC, Page 51.

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3—MAJOR EVENT RELATED OUTAGES

3.1 BACKGROUND

3.1.1 PURPOSE

This Chapter describes Major Events and analyzes vegetation management, potential effectiveness of Pepco's proposed Five-year, Six-Point Reliability Enhancement Plan for Montgomery County, and Pepco's current storm restoration efforts. In addition, this chapter provides recommendations to reduce overall outage rates and shorten the duration of outages for Montgomery County Pepco customers.

3.1.2 HISTORICAL PERSPECTIVE

Major Event outages are defined as events where more than 10 percent or 100,000 (whichever is less) of the electric utility's Maryland customers experience a sustained interruption of electrical service and restoration of electric service to these customers takes more than 24 hours[39]. The Work Group examined in detail, the winter storms of February 2010, the microburst wind outages of July 25, 2010, the summer storm outages of August 5 – 7, 2010 and August 12 – 15, 2010, and to a less detailed extent the January 26, 2011 snow storm. Reports from the much earlier Hurricane Isabel (2003) were also examined. In general, the winter storm outages allow for more meaningful comparisons with the performance of other regional electric utility companies because the storms tend to be broad in geographic extent. The summer storms of July and August 2010 are more difficult to compare across regional utilities given their localized nature. The investigation of Major Events focused heavily on vegetation management and power restoration efforts.

3.2 FINDINGS

Reliability during Major Events has suffered primarily from inattention to and underinvestment in vegetation management and system modernization.

The PSC does not have an adequate process for analyzing Major Storm Reports to determine if the reports are accurate representations of events and whether appropriate corrective actions are identified.

The PSC does not measure the effectiveness of actions taken by utilities in response to findings in the Major Storm Reports.

Major Storm Reports lack metrics to accurately assess the root cause of outages in the adequacy of storm response, and restoration.

[39] See COMAR 20.50.01.03B.

3.2.1 MAJOR EVENT BACKGROUND

Figure 19 summarizes several Major Events regarding service restoration time, number of customers impacted, and cause as identified by Pepco. Numbers provided are for Pepco system-wide, the only complete data sets provided in Major Storm Reports filed with the PSC for Major Events. "Total Personnel Deployed" entry refers to the total of Pepco staff, contractors, and mutual aid provided by other power utilities. As noted, however, the categorizations utilized in specifying "cause" are fraught with overlaps and vagaries.

Figure 19 - Summary of Major Events[40]

	Date			
	February 5, 2010	**July 25, 2010**	**August 5, 2010**	**August 12, 2010**
Final Restoration Date	February 12, 2010	July 31, 2010	August 7, 2010	August 15, 2010
Max Customers Out (Pepco-MD)	97,651	290,872	73,193	87,219
Total Customers Hours Out	3,735,072	10,278,767	738,582	1,553,363
Total Personnel Deployed	900	830	317	745
Caused by Wind	1,121,290	N/A	283,020	70,202
Caused by Trees	1,822,470	4,045,356	212,519	615,021
Caused by Weather	14,285	3,176,281	N/A	13,086
Caused by Lightning	0	1,914,734	85,918	543,322
Caused by Ice	237,600	0	0	0
Caused by Equipment Failure	52,412	245,802	9,198	128,494
Caused by Other	343,099	896,584	48,210	140,536
Source Lost	N/A	N/A	46,876	42,702

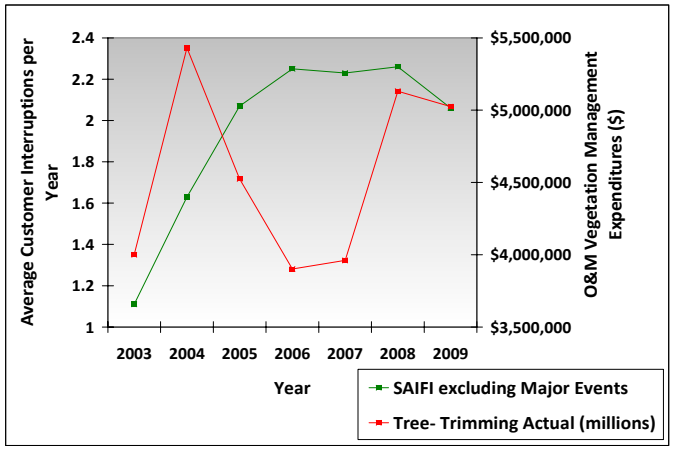
[40] Note: Pepco defines "customer" as a meter in its system, rather than any measure of the total number of affected individuals. For example, there are about ~300,000 meters serving the one million residents of Montgomery County.

Because events vary by duration, resources employed for restoration are often not proportional to the total number of outages. Restoration for the Major Event which started on February 5, 2010, which was actually two storms, was completed in seven days. Restoration for the August 5, 2010 storm was completed two days after the onset of the event. It should be noted that Pepco and other Maryland utilities often report only system-wide data. This can mask local or regional problems by spreading the impacts over a more expansive area. The categories of causes of outages are not defined in the Major Storm Reports. For example, the category "Other" can generally be a significant segment of overall outages but is not further parsed. Finally, advance notice of inclement conditions provided before the February 2010 snow storm produced no faster restoration than the unforeseen July 25 wind storm of the prior year. Both took six to seven days for final restoration (and the July storm outages were much more significant). Improved recordkeeping is not simply a matter of historical nicety; rather, it forms the basis of prioritizing system enhancements and thus improving system performance.

3.2.2 VEGETATION MANAGEMENT

Outages caused by trees occur during both Major Events and, to a far lesser extent, in Non-Major Event conditions. There are several factors that influence current vegetation management practices. First, one of the most commonly utilized vegetation management standards is set forth by the American National Standards Institute (ANSI) and is based on years of growth, rather than a static measure of pruning need. Therefore, implementation of the standard is based on a subjective assessment by each arborist as to the age of growth. Actions over the last decade suggest a shift has occurred regarding the intent of the vegetation management effort. After Isabel, a discussion involving the State of Maryland and utilities operation in the state led to the conclusion that trees could be trimmed with an expectation of controlling interference from growth over the next four years. Prior to 2010, Pepco followed a vegetation management practice that required pruning only for a two-year level of growth[41].

Figure 20 – Relationship between PHI Expenditures for Vegetation Management and Reliability



[41] MC Data Request 4, Q24A.

A strong correlation exists between annual O&M vegetation management dollars expended and system reliability. Since 2003, Pepco has performed less vegetation management and has geographically scaled back its vegetation maintenance program (Figure 20). The PSC Consultants' Report states[42]:

> *In 2003, Pepco began doing less trimming within each plat in order to stretch its available budget. Pepco introduced "condition-based" maintenance to its plat-based trimming program.*[47] […] *Even with the reduction in workload, the Company did not complete ten percent of its scheduled work.*[48]
>
> *From 2004 to 2007,* […] *Pepco cut its program back to focus on only the three-phase portion of the distribution lines, relying primarily on "hotspot" trimming for the one-phase portion of those circuits.*[49]
>
> *In the same four years, Pepco's SAIDI and CAIDI in Maryland essentially tripled.*
>
> […] *During 2008 and 2009, Pepco transitioned from the plat-based program to a prescriptive feeder-based program, in which the Company trimmed all circuits out of a substation, half the substations being done each year.* […] *Even though the Company outspent its budget by almost a million dollars in both these years, Pepco still did not complete approximately 20 percent of its scheduled work.*[50]
>
> *By this time, SAIFI had nearly doubled from where it was in 2003.*

The Work Group also observed that as Pepco began conducting less vegetation management (in 2003) and as Pepco geographically scaled back its vegetation maintenance program (from 2004 to 2007), Pepco's SAIDI and CAIDI tripled.

A comparison to other regional electric utilities is insightful and underscores the correlation between annual O&M vegetation management dollars expended and reliability. In an interview on January 25, 2011, BGE staff told the Work Group that BGE's annual vegetation management program budget for sub-transmission and distribution lines was slightly in excess of $20 million annually[43]. BGE has only 9,000 miles of overhead service lines. By comparison, according to its Reliability Enhancement Plan, Pepco budgets $7.4 million per year for vegetation management[44] for its 14,266 miles of overhead lines[45]. While BGE is responsible for *fewer* miles (some 5,000 fewer miles) of overhead service lines, it is spending $12.6 million more than Pepco for this purpose.

[42] First Quartile and Silverpoint Report to the PSC, Page 37. Note: Citations in block quote are to the PSC Consultants' Report.
[43] Interview on January 25, 2011.
[44] See Pepco Reliability Enhancement Plan, http://www.pepco.com/welcome/news/releases/archives/2010/article.aspx?cid=1523.
[45] MC Data Request 1, Q2.

3.2.3 STORM RESTORATION EFFORTS

Pepco is understaffed and under-resourced to effectively respond to Major Events. In its Major Storm Reports regarding the January 26, 2011 and February 5-12, 2010 winter storms, the Maryland Office of People's Counsel (OPC) provided data that indicate Pepco is understaffed and under-resourced to respond to major events effectively (Figure 21).

Figure 21 - January 26, 2011 Storm Restoration Response[46]

Winter 2011 Storm Effort	BGE	PEPCO
Internal Employees	2,417	964
Outside Assistance People	787	1,206
Total Service Restoration People	3,204	2,170
Peak Customers Interruptions	127,823	189,589
Peak Customer Interruptions per Restoration Person	40	87
Winter 2010 Storm Peak Customer Interruptions per Restoration Person	25	101

Figure 21 shows that Pepco had fewer internal employees and fewer total service restoration people responding to the storm than BGE. Figure 22 also shows that Pepco customers experienced more interruptions.

Pepco customers experience more extensive outages per service restoration person. OPC Report, "Figure 22 - February 5-12, 2010 Storm Restoration Response" [47] illustrated the effect of storms on Pepco customers.

Figure 22 - February 5-12, 2010 Storm Restoration Response[48]

	Allegheny Power	BGE	Choptank	DPL	PEPCO	SMECO
Max Customers Out Per Service Restoration Person	50	25	81	55	101	82

The OPC Report[49] states:

> *A lower number in Table 5 reflects fewer out-of-service customers per available service restoration person. Normally, one would expect that service restoration efforts to be*

[46] OPC Report, Case No. 9256.
[47] OPC Report, Case No. 9220.
[48] OPC Report, Case No. 9220.
[49] OPC Report, Case No. 9220.

accelerated by having more service restoration personnel, relative to the maximum number of customers out of service...

PEPCO, however, which had the highest average service restoration time, did the report the highest number of customers simultaneously out of service per service restoration person. OPC recommends that, in addition to examining the number of service restoration personnel engaged by it during the Storms, PEPCO might also examine its pre-mobilization efforts.

In the February 5-12, 2010 storm Pepco had the longest average service restoration time and had the highest number of customers simultaneously out of service per service restoration person. Clearly, Pepco should examine its service restoration staffing and its mobilization efforts.

All three power companies operating in Montgomery County, Allegheny, BGE, and Pepco, participate in power company mutual assistance organizations such as SEE (Southeast Electric Exchange) and MAMA (Mid Atlantic Mutual Assistance). Pepco has a formal emergency response plan that starts with PHI, the parent holding company and flows down to incident command and incident-support and incident-management committees.

Pepco system restoration efforts are not efficient and Pepco is typically slow in achieving full restoration. Recent Major Event Reports indicate that Pepco system restoration efforts are not as efficient as BGE's and Pepco is typically slower in achieving full restoration. In the Major Storm Report for the January 26, 2011 storm[50], OPC provided a table comparing BGE and Pepco (Figure 23).

Figure 23 – Impacts of the 2010 and 2011 Winter Storms on BGE and Pepco-MD Customers

Winter 2011	BGE	PEPCO
Customer Interruptions	237,283	380,459
Customer Interruption Hours	2,638,048	6,021,515
Hours Per Customer Interruption	11.12	15.83
Winter 2010		
Customer Interruptions	142,228	264,434
Customer Interruption Hours	1,145,347	3,591,156
Hours Per Customer Interruption	8.05	13.58

The Work Group finding is that it appears Pepco is under-resourced in its Major Storm Event response capacity. The Work Group reviewed data for eight events, some of which did not lend themselves to broad comparison. For those storms where comparisons could reasonably be made, Pepco generally provided fewer resources than did BGE (Figure 24). Once again, the Work Group recognizes that local circumstances can impact the number of resources required,

[50] OPC Report, Case No. 9256.

but believes that the recovery trends observed should at a minimum further analyzed by Pepco and the PSC.

The Work Group also found that Pepco does not consistently scale the number of restoration staff to match the relative number of customers experiencing outages. While Pepco does call in local contractors, there does not seem to be a correlation between the magnitude of the response and the number of outages.

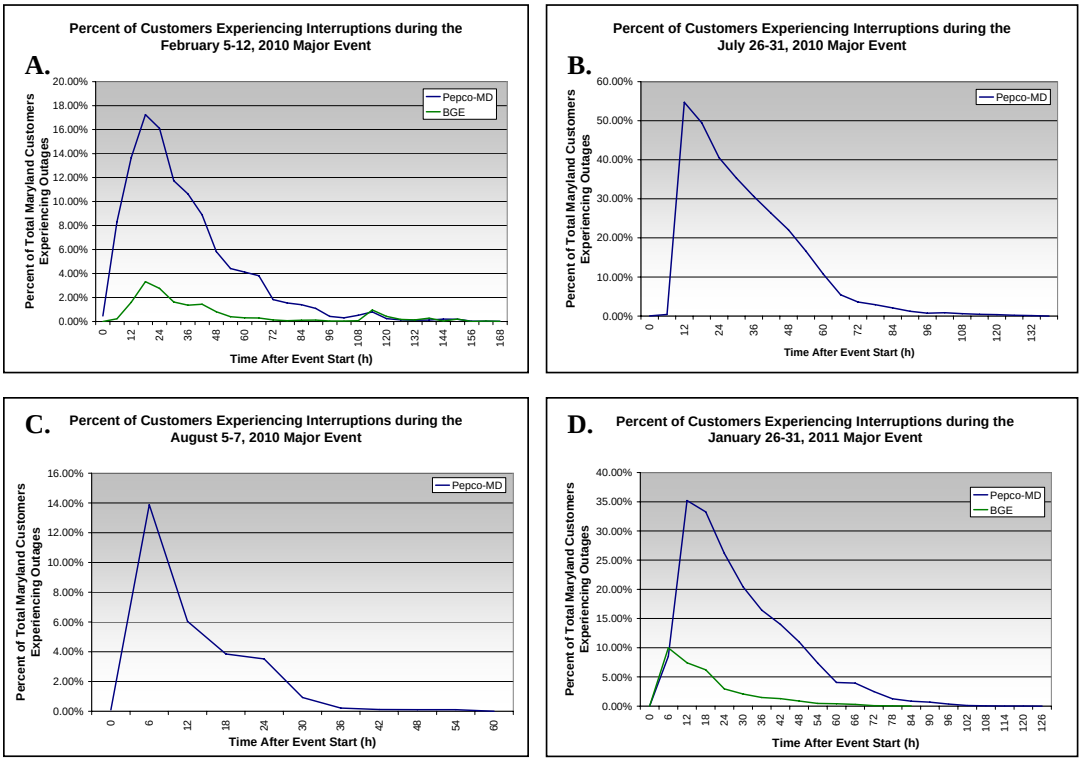
Figure 24: Comparison of Personnel Activation during Major Events

Storm	BGE Customer Outages	BGE Resources Mobilized	Pepco Customer Outages	Pepco Resources Mobilized
January 2011 Snow Storm	237,283[51]	3,204[52]	380,459[53]	2,170[54]
July 25, 2010 Storm	N/A	N/A	323,000	690
February 5-12, 2010 Snow Storm	142,000	514	97,650	662
June 4, 2008 Storm	192,071[55]	576	188,085[56]	220
2007 Winter Storm	68,314[57]	1,956	N/A	N/A
July 2006 Storm	N/A	N/A	58,981	417
February 2006 Storm	168,306	1,377	N/A	N/A
Hurricane Isabel	790,450[58]	6,406[59]	530,000	1,329

The Work Group finds that the shear number and magnitude of outages Pepco customers have experienced in recent years during Major Events should be of great concern (Figure 25).

[51] OCP Report Case No. 9256.
[52] OCP Report Case No. 9256.
[53] OCP Report Case No. 9256.
[54] OCP Report Case No. 9256.
[55] BGE Major Storm Report June 4, 2008.
[56] Pepco Major Storm Report June 4, 2008.
[57] BGE Major Storm Report Feb. 14-17 2007.
[58] BGE Major Storm Report Hurricane Isabel.
[59] BGE Major Storm Report Hurricane Isabel.

Figure 25 – Service Restoration over Time Following the (A) February 2010, (B) July 26, 2010, (C) August 5, 2010, (D) and January 26, 2011 Events



The Work Group finds that the efficiency of the Pepco response is also a concern. Recognizing the difficulty in comparing Major Events across different geographic areas, two Major Events existed in which storm conditions were generally comparable across Maryland: the February 2010 and January 2011 winter storms. Results comparing the rate of restoration are shown in Figure 26.

Pepco uses relatively few staging areas in responding to Major Events. The emergency plans currently in use by Pepco call for staging mutual assistance and other resources include a minimum number of standing locations[60]. While this may be convenient for the Pepco staff itself, the Work Group is concerned that only utilizing the same standard sites for all storms may not lead to an optimal response to different types of Major Events. Depending on the circumstances of an event, the primary staging area may be located a considerable distance from where most customer outages occur. This was the case during the January 26, 2011 snow storm event (Figure 27).

[60] PHI meeting with Work Group on February 11, 2011.

Figure 26: Rate of Restoration After February 2010 and January 2011 Winter Storms

Storm @ 60 Hours	BGE % Customer Restored	Pepco (MD) % Customer Restored
January 2011	96%[61]	89%[62]
February 2010	89.6%[63]	74.4%[64]

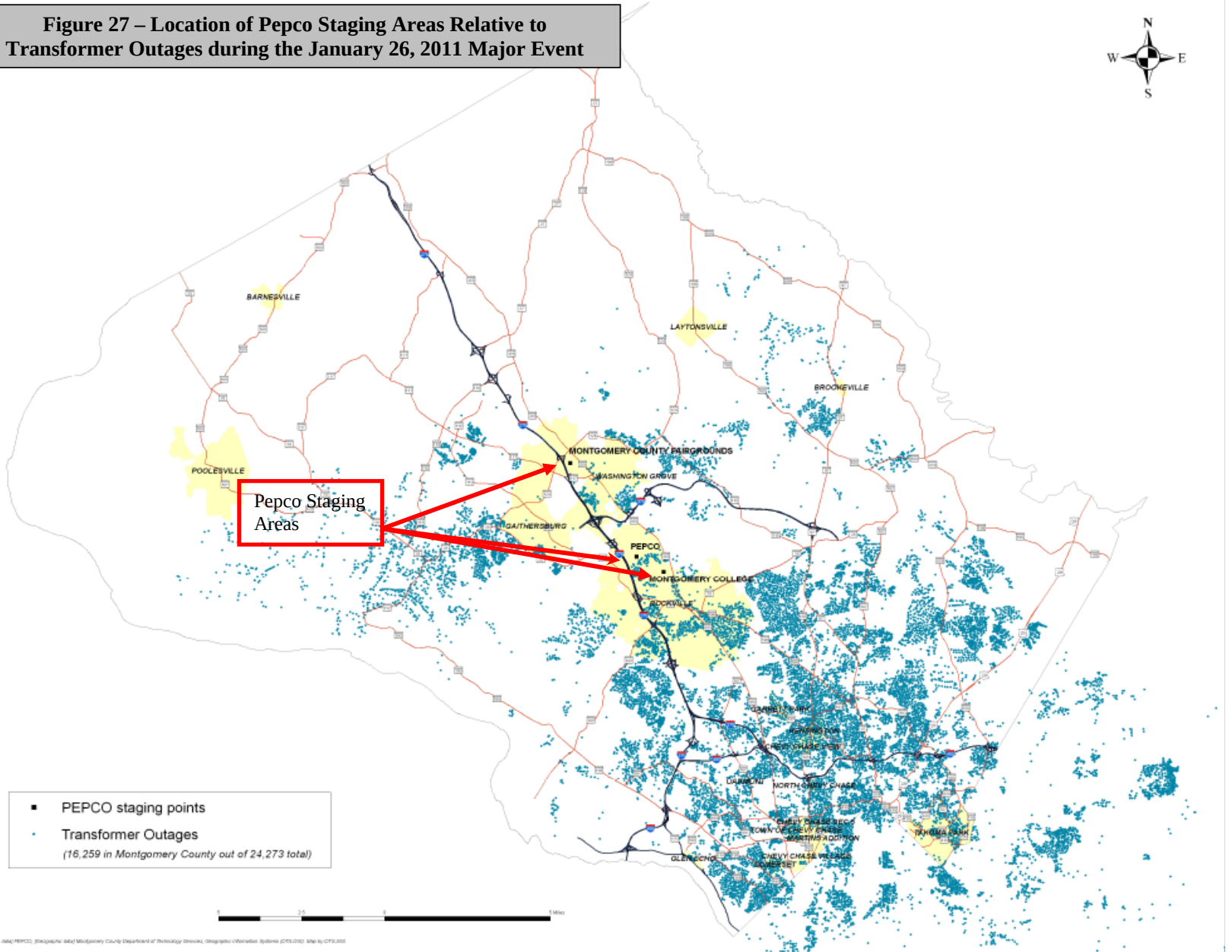
Pepco's infrastructure likely has an impact on the frequency and magnitude of Major Event outages. Poor system design (e.g., sub-transmission and distribution lines on the same pole), upgrading, and lack of preventative maintenance exacerbate major storm outages. Pepco's electric system is built with three sub-transmission circuits (typically 69kv) that supply a substation and twelve distribution circuits (13kv) that originate at a substation and deliver electricity to the neighborhoods in the vicinity of the substation. In many areas the sub-transmission circuits are on the same poles as the distribution circuits. This allows for an efficiency whereby individual overhead lines with only one circuit are minimized. Unfortunately, in areas with a high number of trees, where an overhead line is struck by a tree, the results often include outages on a sub-transmission circuit *and* on two distribution circuits. If two sub-transmission circuits are damaged then the substation is often taken out of service. By installing underground sub-transmission circuits to supply its substations, Pepco would be better able to ensure that its sub-transmission system and its substations are kept in service.

Another issue stems from running both sub-transmission and distribution circuits on the same poles which increases the system's exposure to tree caused outages. "Hardening" the system with tree-wire and spacers in vulnerable areas may help. This dual-use infrastructure design contributes to the frequency and magnitude of Major Event outages, which are largely blamed on trees.

Because equipment that should be upgraded or replaced remains in service it is more likely to fail when exposed to the transient electrical conditions that overload the system during Major Events.

[61] BGE Major Storm Report January 26-27, 2011.
[62] Pepco Major Storm Report January 26-27, 2011.
[63] BGE Major Storm Report February 5-12, 2010.
[64] Pepco Major Storm Report February 5-12, 2010.

Figure 27 – Location of Pepco Staging Areas Relative to Transformer Outages during the January 26, 2011 Major Event



3.3 RECOMMENDATIONS

1. ***The PSC should implement a formal process to either validate or reject safety, reliability, and Major Storm Reports submitted by utilities.***

   It is the Work Group's understanding that currently the PSC receives Major Storm reports from utilities and performs an internal review of each, but does not validate the data contained in the reports. The PSC should provide substantive feedback to utilities on their submissions.

2. ***Pepco should develop a vegetation management program, including metrics that demonstrate efficacy and cost effectiveness of its program. Further, program status should be reported annually to the PSC.***

   Pepco's current Reliability Enhancement Program provides no ability to measure success of its current efforts, nor does it provide for any routine reporting to the PSC on cost effectiveness.

3. ***The PSC should require that utilities under its jurisdiction provide additional data in Major Storm Reports, including outage causes by county, much finer definitions of outage cause categories, and a chronology of requested and provided mutual aid assets.***

   Current Major Storm reporting categories are too few, need to be more specific, and should be common across all utilities, at least in any one state. The Work Group views it to be important that the PSC establish common definitions for each category and that the process for choosing a specific category be consistent across relevant utilities.

4. ***Pepco should periodically review plans for staging personnel and resources associated with responding to Major Event outages.***

   Pepco has indicated to the Work Group that the staging plan has little opportunity for improvement. The plan uses Pepco facilities on Gude Drive, the Montgomery County Fair Grounds, and the Rockville Campus of Montgomery College as its principal staging areas in the County. The Work Group was informed by County staff that offers have been made without effect to assist Pepco with repositioning assets for Major Events in order to improve response times (Figure 27). The Work Group believes a search for alternatives is worth pursuing.

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4—CUSTOMER RELATIONS

4.1 BACKGROUND

4.1.1 PURPOSE

This Chapter addresses customer service systems. In support of its review, the Work Group conducted a survey to obtain information on the extent to which customers have experienced outages, the economic impact of those outages and the magnitude of additional costs customers would be willing to incur in exchange for improved service.

4.1.2 METHODOLOGY

The Work Group used prior reports, its own survey, and submissions from Pepco customers to develop findings and recommendations aimed at improving Pepco's customer interactions and service. The Work Group's survey was initiated on January 7, 2011 and was closed on February 14, 2011. The survey used two formats separately intended for Montgomery County Pepco residential and business customers. There were 10,895 residents and 654 businesses from Montgomery County that responded to the questionnaire. The Work Group additionally reviewed more than 900 written comments submitted by Pepco's Montgomery County customers, storm reports to the PSC submitted by Pepco and other utilities, media reports on major storms, and Pepco's own customer satisfaction surveys.

4.2 FINDINGS

The economic cost to the Montgomery County community, both business and residential, of inferior Pepco performance has been substantial and impacts the County's competitiveness and attractiveness as a place to live and conduct business.

A considerable segment of the County's Pepco customers have simply lost confidence in the utility's ability to provide reliable electrical service leading some with the means to purchase individual back-up generators to do so.

4.2.1 WORK GROUP SURVEY RESULTS

While the Work Group was certainly aware of Pepco's customers' intense frustration with Pepco's performance, the Work Group sought additional information related to the costs of outages and the willingness of Pepco's customers to pay for investments in improving reliability measures through rate increases. Thus, two online surveys were developed--one for residential customers and one for commercial customers. See Appendix B for results.

Survey responses were collected for just over a month, and resulted in 10,895 residential inputs and 654 commercial inputs from respondents who were both Montgomery County residents (or businesses) and Pepco customers. While the design and execution of any online

survey clearly has limitations[65], the data derived from the survey provides information to help assess the economic impacts associated with long outages as well as the degree to which policy choices made by legislators are likely to be supported by Pepco's customers.

4.2.1.1 Respondent Outages and Loses by Customer Type[66]

There were 10,430 residential respondents, or 95.7 percent, that experienced one or more outages longer than five hours in the past year.

- Of these respondents, almost 65 percent reported calling Pepco more than twice to check the status of the outage. Only 5 percent of Pepco's residential customers reported that they did not attempt to call Pepco at all. Of those who experienced long outages, 85.5 percent stated that they incurred costs or other economic losses that they otherwise would not have suffered.

- In addition, 51 percent of residential customer respondents reported experiencing outages of longer than one hour that were not associated with a storm or other Major Event.

- The median range of costs to residential customers reporting costs associated with outages was $100-500, with 51.9 percent of those who experienced losses reporting this range for the magnitude of losses.

- If the above range is extrapolated to all 280,003 of Pepco's residential customer base (as adjusted to reflect the 95.7 percent of residential customers who reported that they experienced long outages and the 85.5 percent of those who reported that they incurred economic losses), then one can roughly estimate that the costs to Montgomery County residents of outages in the past year is $23-$115 million. Put another way, if this range of estimated costs were distributed among all of Pepco's residential customers and expressed as a monthly charge, the impact of outages to residential customers would be approximately $6.80-$34.10 per month—well in excess of the $1.25 per month that Pepco's Reliability Enhancement Plan is anticipated to cost those same customers. While the resources and access available to the Work Group have permitted only a very approximate assessment, these results suggest that the PSC might wish to consider undertaking a more thorough assessment of what appears to be an insufficient allocation of the citizens' resources.

[65] The individuals who respond to such surveys are self-selected as opposed to randomly selected, there is no way to ensure that people respond only one time, etc.

[66] The Work Group believes that these findings are likely to be generally representative of the county's experience as a whole. Since the winter storm of February 2010, Pepco has reported 530,691 extended outages for Montgomery County customers in its major storm reports. With about 280,003 residential customers and 26,691 commercial customers in Montgomery County, the Work Group believes that it is not unreasonable to conclude that at some point February 2010 and February 2011, the overwhelming majority of Pepco's Montgomery County customers have experienced at least one long outage, and that it is also plausible that the majority of those experienced economic losses because of them.

There were 609 commercial respondents, or 94.9 percent, that experienced one or more outages of longer than five hours in the past year.

- Of those who said they had experienced long outages, 83.3 percent reported direct costs or other economic losses that they otherwise would not have incurred.

- In addition, 54 percent of commercial customer respondents reported experiencing outages of longer than one hour that were not associated with a storm or other Major Event.

- More than 91 percent of the commercial respondents reported that they employ under 100 individuals, and 55 percent of these companies reported losses between $1,000-$10,000.

- The median range of costs to commercial customers reporting costs associated with outages was $1,000-$10,000, with 52.2 percent reporting this range as the magnitude of their losses. See Appendix B for the full response to this question. If this is extrapolated to all of 26,691 of Pepco's commercial customer base (as adjusted to reflect the 94.9 percent of commercial customers who reported that they experienced long outages and the 83.3 percent of those who reported that they incurred economic losses), then one can roughly estimate that the costs to Montgomery County businesses of outages in the past year is in the range of $21 million-$211 million. Put another way, if this range of estimated costs were distributed among all of Pepco's commercial customers and expressed as a monthly charge, the impact of outages to commercial customers would be approximately $65.90-$650.00 per month. While the resources and access available to the Work Group have permitted only a very approximate assessment, the results suggest that the PSC might wish to consider undertaking a more thorough examination of the issue.

4.1.1.2 – Work Group Survey Results– Willingness to Support Reliability Improvements

The Work Group's survey presented a set of policy choices[67] related to how reliability improvements might be funded. While Pepco has widely promoted its Reliability Enhancement Plan and appeared to suggest that it was paying for these costs itself[68], Pepco has less vocally indicated that its intent would be to request a rate increase from the PSC in order to recover the costs[69]. The policy choices the Work Group selected for its customer

[67] The Work Group notes, however, that many Pepco customers who submitted written comments to the Work Group believed these were false choices – many wished to have had a choice that would have required Pepco to pay for the investments on their own, without charging customers. The Work Group understands this view, but did not believe that this was a realistic policy outcome and thus did not include it.

[68] See for example, http://www.pepco.com/welcome/news/releases/archives/2010/article.aspx?cid=1552, http://www.pepco.com/welcome/news/releases/archives/2010/article.aspx?cid=1523, or http://www.pepco.com/energy/reliability/ http://www.youtube.com/watch?v=XQt6pGrHLjE&feature=related.

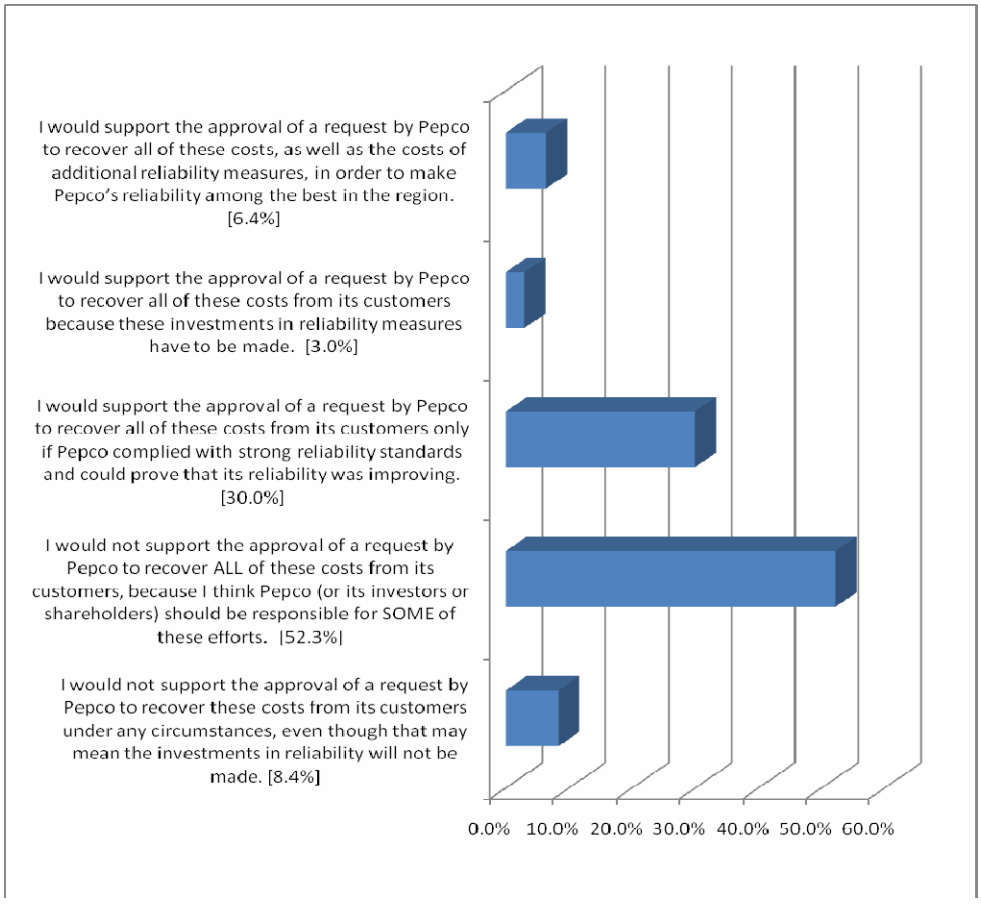
[69] Stephens, J. & Flaherty, M, P. (December 5, 2010). Why Pepco Can't Keep the Lights On. *Washington Post*. Retrieved from http://www.washingtonpost.com/wp-dyn/content/article/2010/12/04/AR2010120403721.html. Also Pepco Reliability Presentation, http://www.pepco.com/_res/documents/ReliabilityPresentation.pdf.

survey (Figure 28) are viewed as representative of the choices that can realistically be expected to be available.

More than 52 percent of residential respondents indicated that they would *not* support a request by Pepco to recover all the costs of reliability investments from ratepayers, believing that Pepco's investors or shareholders should pay for some of the costs.

- Further, 30 percent would only be willing to pay for the investments if Pepco had to comply with strong reliability standards. The full response to this question is depicted in Figure 28.

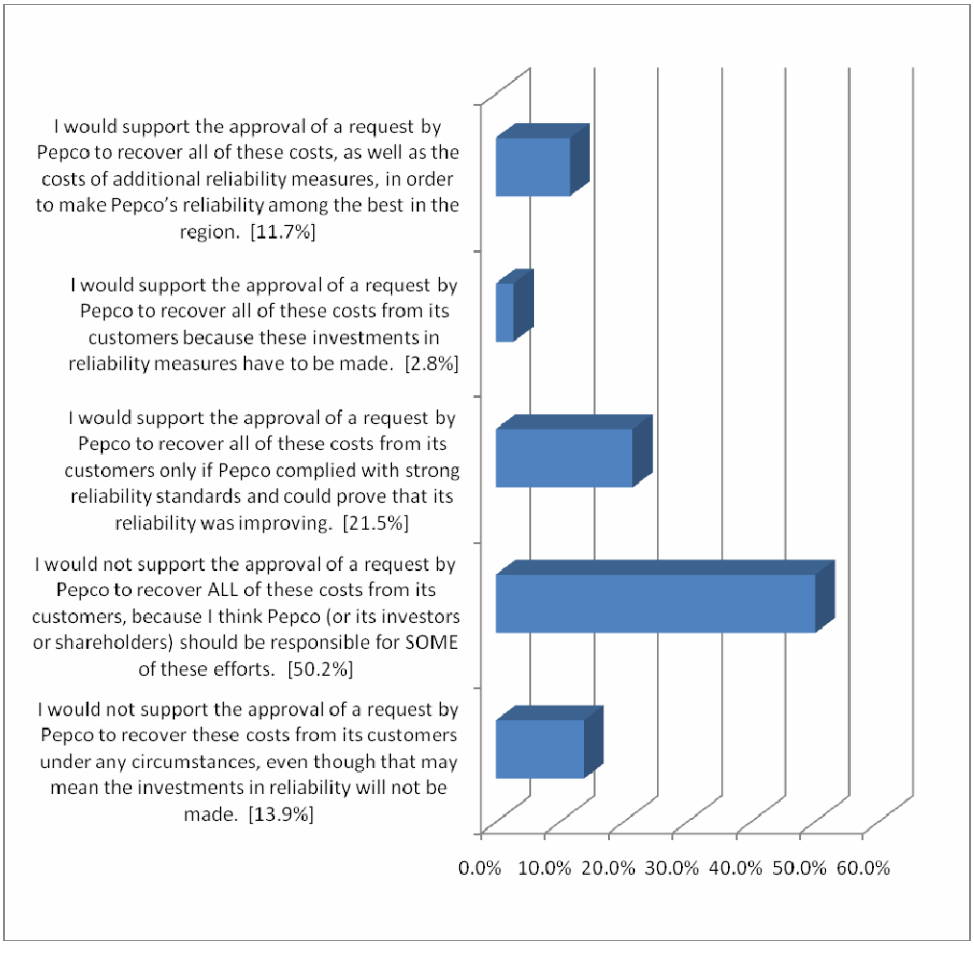
Figure 28 - Policy Choices Supported by Residential Survey Respondents



More than 50 percent of commercial respondents indicated that they would *not* support a request by Pepco to recover all the costs of reliability investments from ratepayers, believing that Pepco's investors or shareholders should pay for some of the costs.

- More than 21 percent of commercial customers would support a request to recover costs of reliability improvements from ratepayers only if Pepco complied with strong reliability standards. The full response to this question is included in Figure 29.

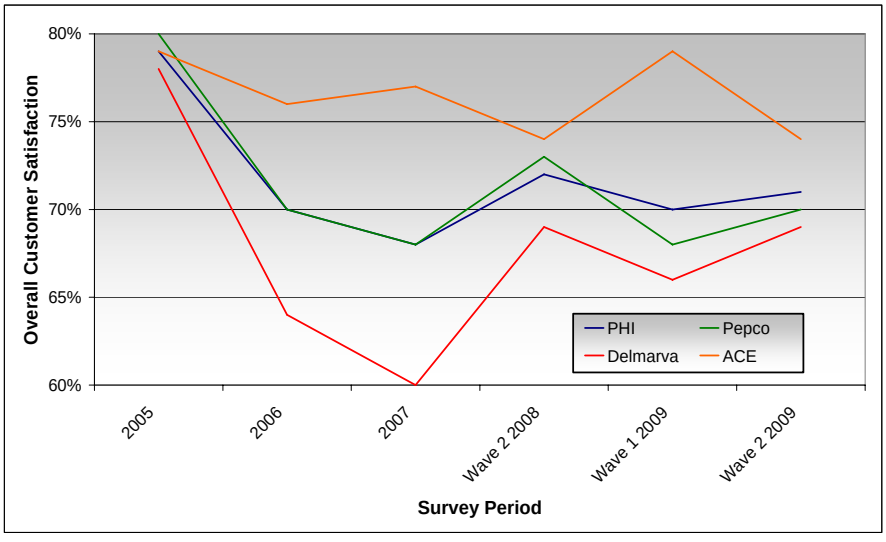
Figure 29 - Policy Choices Preferred by Commercial Survey Respondents



4.2.2 REVIEW OF PEPCO'S CUSTOMER RELATIONS SURVEY DATA

Annually, Pepco conducts its own Customer Satisfaction Survey through Market Strategies International (MSI). A five-year summary of overall satisfaction results for Pepco Holdings, Inc. (PHI)-operated utilities can be seen below in Figure 30.

Figure 30 - Summary of Customer Satisfaction as Reported in Pepco Customer Satisfaction Surveys Conducted by Market Strategies International (MSI)[70]



According to Pepco's MSI Customer Service data, Montgomery County residents were least likely to be satisfied with Pepco, with 66 percent reporting overall satisfaction (ratings of 6-10 on a scale of 10) compared to 73 percent satisfaction in Prince George's County and 74 percent in Washington, DC.

- There were 60 percent of respondents who experienced an outage who were satisfied with the restoration efforts.
- Not surprisingly, respondents who experienced the longest outages were the least likely to be satisfied.

According to Pepco's MSI Customer Service data, most respondents (68 percent in the case of Montgomery County) did not believe they were given accurate information about restoration efforts.

[70] PSC Case No. 9240, Order No. 83552, Q6. Note: Beginning in 2008, MSI started conducting the survey bi-annually in "waves". Pepco, Delmarva Power, and Atlantic City Electric (ACE) are all subsidiaries of the parent company, PHI.

- Of the respondents who experienced outages, expressed overall dissatisfaction, and were not provided accurate information, 67 percent said they were given conflicting or no information by Pepco.

- Montgomery County respondents were the most likely to have experienced the longest outages, with 97 percent of respondents saying they lost power at least once and 54 percent saying the outage lasted at least two days.

- Most respondents believed lines downed by falling trees was the cause of the outage, and that tree trimming or undergrounding of power lines were the best means of preventing outages.

- Of the respondents, 58 percent called Pepco regarding the outage, with 33 percent of Montgomery County respondents reporting they did not get through on the first try. Of the Montgomery County respondents who called, 75 percent said they did not speak to a live customer service representative. Of the respondents, 47 percent indicated they were either neutral about or disagreed with the statement that they were able to communicate effectively with the automated call system.

- Of the respondents, 83 percent who experienced outages either did not, or were not able to, utilize the Pepco website to obtain outage information. Instead, respondents relied on TV, radio and other mass media to obtain information.

4.2.3 AUTOMATED VOICE AND SUPPORT SYSTEMS

The PSC Consultants also found failures of the automated voice and other support systems. The Report stated[71]:

> *Periodic failures of various support systems including the [Outage Management System] OMS, Customer Information System, automated voice response units, and the Pepco website all contributed to inadequate performance in keeping customers and others informed as to progress of the restoration efforts. When these individual failures occurred, Pepco moved quickly to resolve each one. However, when taken in their entirety, all of these issues contributed significantly to the frustration experienced by Pepco's Maryland customers.*

Later the PSC Consultants concluded[72]:

> *Pepco did not, in its live interactions with customers, proactively solicit feedback or reinforce the customer's role in communicating outage status information via available automated call back means to support its restoration efforts, particularly in identifying nested outages. Pepco does not actively promote or reinforce through its live agents who handle outage or [Estimated Time of Restoration] ETR requests, the use of callbacks to confirm restoration*

[71] First Quartile and Silverpoint Report to the PSC, Page 4.
[72] First Quartile and Silverpoint Report to the PSC, Page 118.

and gather customer input. Customers do not have a clear sense of the value of this input as information that can help the Company discover nested outages, which will improve its damage assessments and ability to provide accurate ETRs during the restoration process.

Periodic failures of various support systems all contributed to inadequate performance in keeping customers and others informed as to the progress of restoration efforts, thus contributing to Pepco's poor customer relations.

4.2.4 CUSTOMER SERVICE DURING MAJOR STORMS

Hurricane Isabel and the Witt Report

As previously noted, On September 18, 2003, Hurricane Isabel moved through the Mid-Atlantic region, causing about 545,000 outages among Pepco customers, 394,988 of them in Maryland. Within 72 hours, 70 percent of the customers had their power service restored, although it took more than 10 days until all customers' power was restored. According to media reports[73], Pepco at that time had no system in place to provide restoration time estimates to customers, and most calls were routed to automated systems rather than customer service representatives.

After Hurricane Isabel, Pepco contracted with James Lee Witt Associates to commission a report examining the issues surrounding the response to the hurricane. The Witt Report,[74] from late 2003, stated that "[d]uring a significant power outage, communicating the details of restoration efforts with customers – particularly as it relates to their homes, businesses and neighborhoods – becomes the utmost importance. People and governments expect, sometimes demand, this information and should be provided with it." The report went on to recommend that Pepco improve in identifying the status of customer outages and providing more accurate information to customers.

After the release of the report, then-executive Vice-President Thomas S. Shaw stated that Pepco intended to act on all 150 recommendations[75], and Pepco stated in its formal response[76]:

We have learned that customers expect more from us than just meeting utility standards, and we are committed to meeting those expectations. PHI is taking steps to improve performance across the spectrum of recommendations, none more important

[73] Fisher, M. (June 26, 2006). Pepco: Staying Connected by Dumping Customer Calls. *Washington Post.* Retrieved from http://voices.washingtonpost.com/rawfisher/2006/06/pepco_staying_connected_by_dum.html

[74] James Lee Witt Associates, LLC. (2003). Pepco Holdings Inc. Hurricane Isabel Response Assessment. Page 5.

[75] Mirabella, L. (January 14, 2004). Pepco Moves to Thwart Future Isabel's, Utility Adopts Series of Recommendations to Deal with Major Storms. *Baltimore Sun*. Retrieved from http://articles.baltimoresun.com/2004-01-14/business/0401140214_1_pepco-emergency-management-witt-associates.

[76] Pepco Holdings, Inc. (May 26, 2004) *Pepco Holdings, Inc. Response to the James Lee Witt Associates Hurricane Isabel Response Assessment.*

than communications with our customers. We understand that customers want to know when their power will be restored.

Pepco then committed to the following actions:

- Improving the damage assessment process and field reporting of outage data in order to estimate restoration times more accurately and make them available to customers.

- Undertaking computer enhancements to increase the volume of data the system can process when conducting outage analyses.

- Providing outage maps on the website by summer 2004.

- Improving the training provided to customer service representatives and other personnel who might be made available to assist with customer calls during emergency situations.

- Improving the high volume call answering system.

By the summer of 2006, Pepco had implemented a system to handle more customer calls—an automated system that enabled customers to input their outage information but provided neither an option to talk to a live representative nor any information regarding restoration time. It was not until later that Pepco's automated call system began offering Estimated Times of Restoration (ETRs).

As a result of the shift to an almost fully automated system, customers who live in commonly metered communities without separate Pepco account numbers for each dwelling unit have been unable to obtain restoration time estimates using the automated system. Because these residents' telephone numbers might not be the ones attached to the account, Pepco's automated system is not likely to recognize their affiliation to the relevant Pepco account[77]. Pepco's automated system would then require customers to input their customer account numbers which residents of commonly metered communities might not have available.

Customer service personnel

Pepco has consistently directed a higher percentage of customer calls to automated systems during Major Storm Events (rather to customer service representatives) than BGE and other utilities for which corresponding data are available (Figures 31 and 32).

[77] January 5, 2011 Work Group hearing testimony provided by the Glen Waye Gardens Condominium Association.

Figure 31 - Summary of Recent Major Storms and Corresponding Customer Service Reports[78]

Major Events	Customer Service Reports
June 3-4, 2008: High winds and thunderstorms caused many area utilities to lose power, including 188,000 Pepco customers, 126,652 of them in Montgomery County. Full service was not restored until June 8.	Pepco had fewer customer service personnel on hand the day the storm occurred, and directed a higher percentage of customer calls to automated systems and a lower percentage to customer service representatives throughout the event, than did BGE.
February 5, 2010: Two blizzards dropped as much as 3-4 feet of snow on the region, which caused about 97,651 Pepco customers to experience outages, with 77,574 in Montgomery County[79].	Pepco directed a higher percentage of customer calls to automated systems and a lower percentage to customer service representatives throughout the event than did other area utilities.
July 25, 2010: A strong thunderstorm moved through the region, causing 323,662 outages for Pepco customers, 238,977 of them in Montgomery County.	Pepco had fewer customer service personnel on hand the day the storm occurred, and directed a higher percentage of customer calls to automated systems and a lower percentage to customer service representatives throughout the event, than did other area utilities. 90 percent of Pepco's customer outages were restored within 72 hours of the event with full restoration for Maryland customers occurring by 12:56 AM on July 31.
August 12, 2010: A major thunderstorm caused 101,000 Pepco customers, including 77,445 in Montgomery County at peak.	According to its September 7 Major Storm Report, which it was required to file with the PSC, about 90 percent of Pepco's customers were restored within 36 hours, with the remainder by 4 PM on August 15, 2010.
January 26, 2011: The Washington DC metropolitan area was hit with a snow storm that dropped as much as nine inches of heavy wet snow, along with some ice and sleet in the area. About 210,000 Pepco customers lost power, with 136,695 of these in Montgomery County.	Although Baltimore Gas and Electric customers suffered more total outages than Pepco, it was able to close its storm response center around 10 PM on Saturday January 29 after the vast majority of its outages were restored. By contrast, Pepco had to continually revise its predicted restoration times later and later as crews failed to meet initial milestones, and eventually restored power to 90 percent of its customers after 60 hours, which was longer than it took other area utilities. Some residents did not get their power restored until the afternoon of January 31.

[78] See Appendix B.

[79] Hyslop, M. (February 17, 2010). Officials Say Pepco Did Fairly Well Considering the Conditions it Faced. *Gazette.* Retrieved from http://www.gazette.net/stories/02172010/montnew183709_32553.php

Figure 32 - Customer Service Statistics by Major Event[80]

Utility	# of calls Day 1	Maximum # of Customer Service Reps. On Day 1	% of calls presented to Automated System(s) On Day 1	# of Calls On Peak Call Day	Maximum # of Customer Service Reps. On Peak Call Day	% of calls presented to Automated System(s) on peak call day	Total # calls entire event	% of calls handled by Customer Service Reps.
June 4-8, 2008								
Allegheny	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BGE	51,044	89	61.20%	51,044	89	61.20%	89,075	58.9-72.7%
Pepco	77,172	48	69.10%	77,172	48	69.10%	169,506	40.30%
February 5-12, 2010								
Allegheny	36,514	15	N/A	173,435	41	N/A	382,293	N/A
BGE	5,139	14	56.90%	85,245	98	38.10%	158,515	41-44.6%
Delmarva	2,266	22	61.70%	35,871	113	41.60%	114,357	44.60%
Pepco	10,255	23	91.20%	119,302	50	113,359	56,490	21.80%
July 25-31, 2010								
BGE	112,308	53	52.90%	112,308	53	52.90%	151,637	29.4 – 40%
Pepco	156,212	19	97.90%	156,212	19	97.90%	408,504	28.10%
August 12-15, 2010								
Pepco	82,985	73	80.70%	82,985	73	80.70%	119,870	25.50%

Accuracy of Pepco ETRs and Web-Based Information Provided during Major Events

Since as early as 2003 during Hurricane Isabel, Pepco has been challenged by customer relations communications problems related to accurately estimating power restoration times and providing them to customers. After committing to developing this capability after the Witt Report recommended it do so, it took Pepco three years to implement the new capability. Even after that, as has been previously noted, problems persisted.

For example, Pepco's storm report for the July 2010 storm indicated that its automated estimates of restoration time provided to customers were grossly inaccurate, in some cases ranging to mid-September. Pepco's report stated that this was because there were so many outages reported in such a short time, and there were not many available restoration personnel

[80] PSC Major Storm Reports.

visible to the automated system at the time, that its software basically made a computational error.

Pepco's online resources have also been problematic. For example, during the July 2010 storm its outage map was completely overwhelmed by high demand. After the PSC commenced its investigation, Pepco committed to improving its outage maps and estimated times of restoration, as well as ensuring that its web-based resources would also be made compatible with smart phones. Despite these earlier commitments, Pepco experienced identical problems during the January 2011 storm. During that event, Pepco's web-based outage map itself had an extended outage and Pepco systems were still not compatible with smart phones or other mobile devices. In addition, the Pepco call center voicemail box soon filled to capacity.

In addition to those problems, ETRs were inaccurate once again. The PSC Consultants' Report cited inaccurate restoration times and other information provided to customers as being major sources of customer frustration. The Report stated[81]:

> *The real concern with Pepco not completing full damage assessments is the effect it has on* […] *the restoration effort—developing ETRs. Incomplete damage assessment exacerbates problems associated with calculating them. Without a complete damage assessment, Pepco could incorrectly assume that a customer group is without power because of only one outage, but in reality it could be due to two or more outages somewhere along the system. Original estimates for when customers can expect to be restored can be substantially off, leaving customers frustrated.*

The Work Group agrees that Pepco's incomplete damage assessments made a bad situation worse because Pepco's restoration efforts "could" have been based on faulty assumptions, thus preventing Pepco from being able to properly determine resource gaps and optimally allocate the personnel needed to repair infrastructure and restore power. The Work Group, however, disagrees that physical restoration efforts in the 2010 storms were "reasonably good, with the exception of its failure to complete damage assessments"[82]. The Work Group views that Pepco could greatly improve restoration efforts by addressing infrastructure shortcomings and Pepco's storm response procedures to include poor coordination with state and local governments. These topics are discussed in other chapters of this report.

[81] First Quartile and Silverpoint Report to the PSC, Page 3. The Report stated that restoration is a "three-pronged effort. The first involves the physical activities—locating the damage, dispatching crews, and effecting repairs—needed to bring customers back on line. The second involves developing estimates of expected restoration times to give to customers. The third is communicating with the public throughout the event. These three parallel efforts occur simultaneously during an outage event, and they are clearly interrelated."

[82] First Quartile and Silverpoint Report to the PSC, Page 4.

4.2.5 QUALITY OF CUSTOMER SERVICE DURING NORMAL OPERATIONS

The PSC Consultants' Report concluded that[83]:

> *Pepco's response to customer call volume (as measured via services level/TSF) was adequate with regards to technology and, with several exceptions, adequate in support of live calls.*

The Work Group believes that judgments of the adequacy of customer call efforts should be based on the quality and accuracy of the information exchanged between the customer and the utility. Based on media reports[84], the presentations made to the Work Group at its January 5, 2011 public meeting, and a review of the more than 900 written submissions to Montgomery County[85] related to the Work Group's efforts, indicate that Pepco's customer service representatives often lack accurate information and in some instances do not treat customers with respect, whether the call is related to a blue sky outage or a bill dispute. The PSC Consultants' Report did identify Pepco's inadequate support of live calls stating:

> *Live agent service levels in 2010 under regular operating conditions (approximately 45 percent answered in 30 seconds) were below the benchmark averages (62 percent answered in 30 seconds) of utilities benchmarked operating under overall operating conditions. Monthly levels of abandons for live offered calls, excluding storm months, averaged slightly over 15 percent for the year. This is significantly below the benchmark average of approximately 5 percent. In addition to high abandon rates, the wait times for those customers seeking to speak to agents would be higher than the average experienced by benchmarked companies.*

Examples of typical customer frustrations are provided in Appendix B.

4.3 RECOMMENDATIONS

After each major outage that caused public complaints, Pepco has committed to making necessary improvements to its processes and systems, yet each time there is a storm, the same problems recur or manifest themselves in a slightly different but equally disruptive manner. The PSC should aggressively oversee Pepco's customer relations efforts to be certain that needed improvements are in fact implemented.

The following recommendations to improve customer communications and relations are offered:

> ***1. Pepco should factor in the amount of time a customer has been without power when updating restoration priorities.***

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[83] First Quartile and Silverpoint Report to the PSC, Page 107.

[84] Fisher, M. (June 26, 2006). Pepco: Staying Connected by Dumping Customer Calls. *Washington Post.* Retrieved from http://voices.washingtonpost.com/rawfisher/2006/06/pepco_staying_connected_by_dum.html and Fisher, M. (June 28, 2006). You Want to Talk to Pepco? Press 1 and Hold for Machine. *Washington Post*. Retrieved from http://www.washingtonpost.com/wp-dyn/content/article/2006/06/28/AR2006062802007.html.

[85] For a few selected written comments the Work Group found especially compelling, please see Appendix B.2.

The Work Group learned that BGE adds a new restoration priority into its response algorithm that also factors in the amount of time a customer has been without power. In this way, customers who have suffered the longest can be moved real-time to a higher priority position for restoration. This would be especially important during prolonged outages in inclement weather.

2. Pepco should modify its customer information system to include the capability to provide a complaint reference number for tracking purposes. The utility should also provide additional training to customer service representatives on being courteous and getting accurate information to customers even under stressful conditions. The Work Group also supports the PSC Consultants' Report recommendation (VIII-6) that Pepco establish more frequent outage communications refresher training.

The complaint reference number, along with the identity of those who assisted the customer and the information provided or action taken or both, should be preserved electronically by Pepco and updated each time the customer calls about the same problem.

All customer service representatives and "second-role" employees who handle customer calls during emergency events should be trained and familiar with key outage-related information, as indicated in the PSC Consultants' Report.[86]

The Work Group supports the PSC Consultants' Report recommendation that Pepco should update its Contact Center storm plan.[87]

The Work Group supports the PSC Consultants' Report recommendation that Pepco implement a quality control process that includes specific call monitoring, sampling and scoring of all call answerers during outage events as a tool for quality improvement, feedback and consistency purposes.

3. In advance of forecasted storms, Pepco should ensure that its customer call center staff is augmented in order to respond to as many calls as possible with live customer service representatives

BGE routinely has 240 customer call-line personnel (80 for each 8 hour shift) available during normal operations[88]. For Major Events, BGE has 348 additional BGE personnel who typically perform other duties who have been trained and are able to supplement the 240 dedicated personnel. By comparison, Pepco has 135 employees and contractors assigned to customer service activities in the Pepco Maryland region.[89]

4. Pepco should create an ombudsman office to facilitate the resolution of customer complaints (related to outages, billing, or other matters). Pepco should provide, to

[86] First Quartile and Silverpoint Report to the PSC Page 119.
[87] First Quartile and Silverpoint Report to the PSC Page 119.
[88] January 25, 2011 meeting of the Work Group with BGE.
[89] MC Data Request 4, Q1A.

the PSC, State and local governments, and the public, periodic reports (e.g., quarterly) containing a summary and description of the nature, number and resolution of customer complaints by this office.

The Work Group learned that some Pepco customers are simply unable to get their complaints resolved in a satisfactory and timely manner. An ombudsman, and additional transparency into the nature and quantity of Pepco's customer complaints, should help to accelerate the resolution of such enduring problem-cases. Similarly, PHI should establish an ombudsman to address chronic reports of inferior performance.

5. Pepco should improve its web-based communications, including ensuring the resiliency of its outage map, creating a means to report outages online, and ensuring that web-based resources are compatible with smart phones and other mobile devices.

The repeated failures of Pepco's online resources have been well-documented.

6. Pepco should prominently include on all customer bills an account-identifier number to assist those seeking to contact Pepco as well as Pepco itself in resolving problems.

Metered communities are unable to access the information Pepco provides on its automated systems because they do not have a unique account-identifier. The Work Group heard from numerous representatives of commonly metered customers that it was not easily possible to obtain information about outages in these communities.

7. Pepco should implement timely and accurate damage assessment protocols, as indicated in the PSC Consultants' Report, to ensure that more accurate ETRs are consistently provided to customers[90].

A key to successful customer relations efforts is to provide accurate and useful information. Customers who are informed that their outages may take days to repair, and who have confidence in the accuracy of that information, will be better able to adapt to their situations than those who are provided with inaccurate information or no information at all.

8. The PSC should establish a reliability standard that is directly related to customer relations efforts, and establish penalties associated with non-compliance. This standard should include:

- Numbers of calls during a major outage that were satisfactorily responded to within a set period of time. This standard should include criteria that will maximize the number of calls that are responded to by live customer service representatives as well as criteria that evaluate the accuracy of restoration times and other information that is provided to customers;

[90] First Quartile and Silverpoint Report to the PSC, Page 91.

- Degree of compliance with a PSC-approved storm communications plan which addresses staffing levels and training for customer service representatives;

- Adequacy and accuracy of web-based communication;

- Accuracy of all information provided to customers, including information to the media and to government officials.

9. The PSC should review and ensure publication of Pepco's and PHI's ombudsmen reports.

The ombudsman report should include a summary and description of the nature, number and resolution of customer complaints. It is the Work Group's position that the adequacy of customer call efforts should not be based solely on how quickly a call is answered, but also on the quality and accuracy of the information exchanged between the customer and the utility. Similarly, it believes that particularly egregious cases should be brought to the attention of senior management above the level of Pepco itself.

5—ECONOMIC CONSIDERATIONS

5.1 BACKGROUND

5.1.1 PURPOSE

This Chapter addresses the (1) economic value of outage prevention and mitigation; (2) utility compensation under Commission rules; (3) Commission preparedness to make judgments about outage performance; and (4) alternate approaches to economic consequences. This Chapter discusses whether and how Pepco spends money on outage prevention and mitigation depending in part on the financial rewards and penalties it expects to receive from its performance and addresses the need for clarity in rewards and penalties in legislation and PSC actions.

While this chapter addresses economic consequences of sub-par electric power service it should of course be noted that many of the more significant consequences are not measurable in monetary terms—if at all.

5.2 FINDINGS

Neither Pepco nor the PSC has compared the economic impacts to customers resulting from prolonged or frequent outages to the costs of preventing such outages.

The PSC has not yet modified the Bill Stabilization Adjustment (BSA), pending in Case No. 9257, to prevent Pepco from being insulated from the financial effects of reduced energy consumption arising from imprudent outage management.

The PSC has not implemented economic incentives or disincentives for Pepco's distribution and transmission business that are sufficient to replace those normally present in a competitive market.

State budget decision makers have not paid sufficient attention to the resources the PSC needs if it is effectively to oversee Pepco's performance.

5.2.1 ECONOMIC VALUE OF OUTAGE PREVENTION AND MITIGATION

To set appropriate expectations for reliability, decision makers must define the relationship between the cost to customers of outages and the benefit to customers of outage mitigation. However, Pepco does not collect and report this information to the PSC and the PSC does not require utilities to provide this information.

Pepco lacks necessary information on the financial value to its customers of its reliable service, and the cost to its customers of repeated or extended outages. Pepco also does not predict customers' outage costs, or inquire about costs after an outage. In short, Pepco does not have estimated or actual customer costs relating to the loss of electrical service. Thus, any

Pepco decision to set internal standards or to spend ratepayer money, and any Commission decision setting standards or authorizing cost recovery from ratepayers, will not have a clear, defensible benefit-cost ratio. An additional discussion of economic findings is provided in Appendix C.

5.2.2 UTILITY COMPENSATION UNDER COMMISSION RULES

The PSC has set forth no rules for utility company outage performance. The Commission does not presently have a clear policy on assigning the utility financial consequences for outage imprudence. Nor has Pepco offered any proposals in this regard.

While the PSC's guiding statute authorizes civil penalties for violation of rules, there are currently no rules for outage performance. Until there are rules on outage performance, there is no foundation for assigning financial consequences. Because penalties cannot be retroactive, Pepco will face no financial consequences for its own imprudence from past outages[91].

The PSC is now considering, in Case Nos. 9257 – 9260, an adjustment to Pepco's "decoupling method."

The District of Columbia Public Service Commission has recognized that "decoupling," unadjusted, shields the utility from economic consequences of outages, including outages caused by imprudence, because it allows a utility to recoup its outage-induced revenue losses by charging more for the distribution per kwh (kilowatt hour) during periods that the customer base used fewer kwhs[92]. While this may be reasonable during periods of normal operating conditions that happen to require the use of less electricity by ratepayers, some have found it unreasonable if the explanation for the lower-than-normal electricity usage is due to a long outage caused in whole or in part by a utility's imprudence. The D.C. Commission therefore has adjusted its Bill Stabilization Adjustment (BSA) so that if there is a major storm, the revenues that Pepco would recover under decoupling are reduced.

When Pepco was asked if it had knowledge of an appropriate existing penalty-reward system or could suggest one of its own, the Work Group received no useful information.

When asked for examples of outage-related regulatory treatment in other states, the Company said it had not performed any such analysis. Specifically, the Company said[93]:

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[91] OPC Data Request, Case No. 9240.

[92] "Decoupling" means decoupling profits from sales volumes. Prior to 2007, if the utility's sales volumes decreased, it would forego profits. Under the Bill Stabilization Adjustment (BSA) approved by the Maryland Commission, if in a particular month the company's sales were below or above those projected in its most recent rate case order, there is a "true-up" feature that either charges the customers extra to make up for the foregone revenues or refunds to customers the excess revenues, in the next month. Thus if there is an outage that reduces sales, the company loses no revenues even if that outage was caused by imprudence. This treatment incorrectly protects the utility from the consequences of its imprudence, causing ratepayers to pay for service they never received.

[93] MC Data Request 3, Q3F.

The studies and analyses with regard to "other states" and the request for the Company's position of the scope and effectiveness of regulation in "other states" have not been performed.

When asked about current practice and for Pepco's assessment of Maryland's present approach to compensation related to outage performance, the Company responded[94]:

Until the Commission takes final action [in Docket No. RM-43], the Company cannot make a final assessment.

Finally, when asked about compensation arrangements that would best induce Pepco to address outages effectively, the company stated only that[95]:

The Company is highly motivated to address outages effectively.

5.2.3 COMMISSION PREPAREDNESS TO MAKE JUDGMENTS ABOUT OUTAGE PERFORMANCE

Commission-required reports on outage statistics are not an adequate substitute for a system of clear standards and consequences, consistently and publicly administered by a PSC internal, expert staff.

The PSC's existing annual reliability reporting is insufficient for implementing or measuring meaningful outage performance standards. To measure success or failure, the PSC should ask the correct questions and maintain a knowledgeable, skilled staff to interpret the data collected.

The Work Group attempted to determine staffing adequacy by submitting a questionnaire to the PSC and its staff regarding current levels of expertise and staffing levels.

The Work Group received no response from the PSC or its staff regarding these questions. The questions posed are in Appendix C.

5.2.4 ALTERNATE APPROACHES TO INCENTIVES AND PENALTIES

The Work Group received more than 900 written comments from customers. Many expressed their strong desire to be compensated for their outage experience. While the Work Group views it not practicable or affordable to fully compensate customers for economic losses, there are states that have penalty systems related to poor utility performance. In some states, penalties are directed back to affected customers[96].

[94] MC Data Request 3, Q3G.
[95] MC Data Request 3, Q3H.
[96] Pacific Economics Group's Report "Service Quality Regulation for Detroit Edison: A Critical Assessment."

5.3 RECOMMENDATIONS

1. ***Expenditures for outage management should bear a reasonable correspondence to a benefit-cost ratio that reflects the value customers place on outage avoidance and the costs needed to comply with Commission requirements.***

   The PSC should determine periodically the approximate dollar value that customers would be willing to pay for various levels of service reliability through open, transparent community inquiry.

   Pepco should be directed, and other stakeholders invited, to present to the Commission its own proposed determinations for how much various levels of service reliability should cost, including projections for the costs of compliance with any Commission requirements. The Commission should issue guidelines, after receiving comments from interested parties, for addressing the data and analytical techniques necessary to support these determinations.

   Furthermore, each utility should be required to submit annually to the Commission a report comparing the costs incurred by ratepayers for outage management to these established customer values. This report should describe the main cost drivers for outage avoidance and outage mitigation, and the main benefits derived from these cost drivers.

   In the end, it is the customer who ultimately pays the costs of outages, reliability enhancements and regulatory practices.

2. ***The PSC should establish clear expectations regarding utility financial consequences for foregone revenues from reduced sales, and other financial consequences, arising from imprudent performance.***

   Those expectations should reflect two main principles. First, customers should pay for service received, but not for service they do not receive, when the service not received is attributable to utility imprudence. Second, the Company should be financially motivated, by remedies the Commission has authority to impose, to take all prudent actions necessary to avoid and mitigate outages. These principles translate into a set of responsibilities for ratepayers, utility companies, the PSC, and the General Assembly (Figure 33).

Figure 33 – Economic Considerations Recommendations (by Implementer)

RATEPAYERS	UTILITY COMPANIES
Ratepayers should pay rates reflecting reasonable utility expenditures. Their rates should reflect all prudent utility expenditures incurred to avoid or mitigate outages. **Ratepayers should not pay for costs necessitated by the utility's past imprudence.** If a company has imprudently managed past outages, and now has to spend extra money to correct the damage caused by the prior imprudence or meet Commission requirements or both, it should not be able to collect extra money from ratepayers in order to do so.	**Utility companies should design and propose to the Commission the appropriate level of expenditures for outage prevention and outage mitigation necessary to meet or exceed Commission requirements.** **The utility should bear the associated revenue losses and be subject to penalties** where an outage cost to ratepayers occurred because the utility failed to make the appropriate expenditures, or failed to use its resources wisely.
THE COMMISSION	**THE GENERAL ASSEMBLY**
The Commission should establish standards, approve prudent expenditures; and, design and administer a method of assigning financial consequences for imprudent performance. • The Commission should establish standards that induce the utility to propose, incur, and recover from ratepayers the prudent level of expenditures necessary to avoid and mitigate outages. • In determining the level of prudent expenditures, the Commission and the Company should apply this principle: Ratepayers should pay for that level of outage expenditures consistent with Commission requirements and their system-wide valuation of outage avoidance. • The standard for imposing penalties or other remedies should be that the utility failed to meet the Commission's standards and that that failure was attributable to the utility's imprudence. • If the Commission has denied rate recovery of outage prevention or outage mitigation expenditures, the utility should not be responsible for sales losses, penalties, or other remedies (if the company expenditure was a prudent part of an outage plan), to the extent the outage would have been avoided by the expenditures proposed by the utility but denied by the Commission.	**The General Assembly should grant the Commission sufficient statutory power to establish standards, prescribe specific actions, and impose penalties and other remedies including cost disallowances for imprudent performance.** The legislature should not, however, prescribe specific standards, penalties, or other remedies but rather require the Commission to establish consequences sufficient to assign the utility the full risk of imprudent performance. **The General Assembly should also allocate to the Commission funds sufficient to hire (as employees, consultants or both) the expertise necessary to make credible professional judgments about the utility's performance.**

3. Utility revenue losses associated with an outage should be the utility's losses to the extent the losses are attributable to poor judgment or mismanagement, including failure to meet PSC standards.

The Commission will need to adjust its prior BSA decision for this purpose; otherwise ratepayers would be responsible for revenue losses attributable to imprudence.

4. A penalty for non-compliance with PSC standards should be established to align the utility's self-interest with the public interest.

A penalty for non-compliance with Commission standards is appropriate, even where the utility incurs revenue losses connected with outage imprudence.

5. The PSC should make a decoupling adjustment promptly, particularly since its original approval of the BSA in 2007 was based on an incorrect premise – that the company was providing reliable service to its customers – a premise proven wrong by the company's outage performance since that time.

The Commission should also recognize that adjusting the BSA, by itself, only prevents the Company from being financially indifferent to outages; it does not substitute for a full set of standards and penalties or other remedies that will induce the Company to align its self-interest with the public interest and improve its performance.

6. The individuals making staff recommendations to the PSC should have relevant expertise levels at least equal to that of utility companies' staffs.

The Commission should determine, by surveying other regulatory agencies and utilities, the professional requirements for internal staff that will assure the knowledge, credentials, experience, size and credibility to accurately judge utility outage performance. The Commission should have an available supply of staff members who are experts in the full set of outage issues because Commission evaluation of outage preparedness and outage management is a continuing responsibility. When unique, technical issues arise, there must be access to consultants with unique technical experience and the financial means to retain them.

7. The State of Maryland should require and financially support the hiring of sufficient PSC staff specifically educated and credentialed in the area of establishing requirements for outage management, evaluating performance and assigning consequences.

A utility that knows that its actions will be judged rigorously, but fairly, will be more likely to improve its performance than a utility that faces a regulatory staff insufficiently sized and resourced.

8. Once the PSC finds that an outage has resulted from a failure to meet the established standards, it should determine the extent to which utility mismanagement or poor judgment contributed to the failure.

The Commission should set standards by rule, penalties, and other remedies. Commission action should be based on the extent of utility culpability.

9. ***Any financial consequences imposed by the PSC should be sufficient to eliminate any utility tendency to cut necessary expenses in order to increase profits.***

   The Commission should have discretion to establish penalties and other remedies. The principle for establishing the penalty size should bear some connection to the costs that a prudent utility would incur to meet the standards. If a remedy is of a financial nature it too should relate to the cost that the utility would incur to meet the standards. That is, the penalty or remedy should be sufficiently large that it eliminates the increment of profitability associated with inappropriate cost-cutting.

10. ***The amount of any penalty or remedy imposed by the PSC should vary with the degree of imprudence, the severity of the effects on the public, and the nature of the non-compliance.***

    When the imprudence is more egregious, the penalty, or remedy if of a financial nature, should be larger. Economic consequences should rise with repeated acts of non-compliance with Commission standards. Further, economic consequences should not be recoverable from customers nor be returned to the utility to spend on meeting the Commission's standards.

11. ***The PSC should consider using all or a portion of penalty or remedy proceeds to provide customer refunds, perhaps in proportion to their usage or to the duration of the outages they experienced.***

    The Commission should balance equity to customers (both residential and commercial) who have experienced losses (both financial and economic) and administrative practicality when deciding how to distribute penalty or remedy proceeds.

12. ***The PSC should establish, well in advance of any crisis or urgency, the procedures by which it would implement these recommendations and the likely circumstances under which it would do so.***

    The Commission should create a time table and formal process for implementing these recommendations.

13. ***There should be no conflict between earnings and outage performance.***

    The Commission should require Pepco to present its plan for outage-related compensation, including how it impacts all executive employees, and report annually on its effects.

14. ***The PSC should evaluate the penalties, remedies and incentives utilized by other states to arrive at a mechanism that is equitable and feasible.***

The Commission should direct its staff to conduct a survey of state regulatory commissions to build a database of best practices as a basis for decision making.

15. The PSC should make clear that compliance with its reliability standards, while insulating a utility from penalties or other remedies associated with non-compliance, does not insulate it from other remedies for imprudence under the PSC's authority such as disallowances in rate cases.

A utility can comply with all the rules, all the performance expectations, but still be imprudent: by, for example, spending too much money on compliance, over-using outside contractors for short-term benefit while failing to build a long-term competent staff (or the opposite, i.e., under-using outside contractors in favor of maintaining too large a staff).

16. A utility should not be able to use "financial weakness" as a shield against the consequences of its imprudence. If the PSC detects a pattern of deficient outage performance that puts ratepayers in a position of having to protect a company from its own imprudence, the Commission should initiate lawful procedures to find a replacement for the utility.

While the Work Group is hopeful that the PSC can induce all utilities to meet acceptable performance standards, this course of action (i.e., replacement) should still be available (Appendix E).

6—GOVERNMENT INTERFACES

6.1 BACKGROUND

6.1.1 PURPOSE

This Chapter addresses how Montgomery County and municipal governments and Pepco should work together to plan, prepare, and respond to outages and other related events impacting the County's electrical service. This Chapter presents findings on current practices for both Pepco and the County and provides recommendations for improvements for both Pepco and the County. Government and Pepco have the mutual objective of mitigating power outage events and decreasing their impact on the people who live, work, and visit in Montgomery County. Recommendations were developed based on emergency management best practices and lessons learned from previous incident experiences. It is the view of the Work Group that these recommendations, if adopted, will result in an overall greater coordination of efforts.

6.2 FINDINGS

The lack of adequate and timely data during Major Events from Pepco hinders government decision-making.

During Major Events, Pepco does not provide to Montgomery County's government company representatives who have been trained to use Montgomery County's emergency systems.

Pepco's emergency operations plans do not include certain key functions and do not clearly address coordination with government entities. This includes the lack of a notification system to inform Montgomery County government or local municipalities of outages or maintenance plans that could affect the community.

Pepco has been provided inadequate authority by the County and State to perform vegetation management on private property when vegetation significantly imperils system reliability.

6.2.1 CURRENT INTERFACES

Government and Pepco have the mutual objective of mitigating power outage events and decreasing their impact on the people who live in, work in, and visit, Montgomery County. However, the responsibilities of government and Pepco are substantially different. During outages Pepco focuses on power restoration. The County and incorporated municipalities concentrate on providing governmental services to the impacted community, including facilitating Pepco recovery activities, as well as on assisting in establishing priorities for power restoration.

The Montgomery County Emergency Management Group (EMG) is comprised of representatives from State and County Departments, incorporated municipalities, utilities, non-profits, volunteer, and private organizations. Together, the EMG plans, trains, exercises and supports an emergency management corrective action program. These activities are

intended to ensure the EMG staff has the minimum required skills to support the Montgomery County Emergency Operations Center (EOC) when activated during County emergencies. This continuous year-round relationship and its activities are referred to as the preparedness cycle (Figure 34).

Figure 34 - Emergency Management Preparedness Cycle

It is critical that the County and its partners work together in all aspects of the preparedness cycle, have systems allowing for information sharing, and establish a culture allowing for corrective action issues to be identified and remedied on-site. Between December 2009 and February 2011, Montgomery County had six activations of its EMG and the EOC. Recommendations and proposed standards in this report are a result of information provided regarding these activations, from interviews, documentation provided by government and Pepco officials, and review of the PSC Consultants' Report.

The Work Group documented three areas of improvement the County's Office of Emergency Management and Homeland Security (OEMHS) indicated were critical for improved collaboration between Pepco and Montgomery County Government:

1. **Pepco should adopt proactive notification systems to provide government officials timely information specific to outage type, magnitude, and location**.

   According to Montgomery County and city officials, Pepco does not currently have systems in place to routinely notify the County of significant outages during Major and Non-Major Event circumstances.

2. **Pepco should institute a corrective action program to include government representatives.**

   According to Montgomery County officials, Pepco conducts Major Event exercises and after-action meetings. However, these exercises are internal to the company. Neither Montgomery County nor any other governmental agency has been included in these exercises. Similarly, Pepco has not shared any report with government representatives identifying areas needing improvement.

3. **Pepco should have designated staff that works consistently with governmental officials on both preparedness and response activities**.

   According to Montgomery County officials, in six EOC activations over the past 18 months, Pepco did not send trained representatives to the EOC. As a result, Pepco was unable to utilize EOC information sharing systems and effectively support the County's Emergency Operations Plan. The Work Group agrees with the PSC Consultant Report finding[97]:

> *Requests are typically in areas of critical importance or outage events, in the form of listed needs for wires down, road closures, critical care, and coordination with transportation for plowing or road clearance. Beyond these types of coordination and communication other than Graphical Information System (GIS) layers. These are in the form of an e-mailed file that would show areas of outage location so that EMA can assist in placement of road plows, increase law enforcement, etc.*

6.2.2 FACILITY RESTORATION PRIORITIES

In order to improve facility prioritization, it is critical to understand Pepco's current practices, which are largely internally focused within the utility, and how improvements can be made by working more collaboratively with government agencies.

The information below describes Pepco's current restoration strategy. Pepco asserts that[98]:

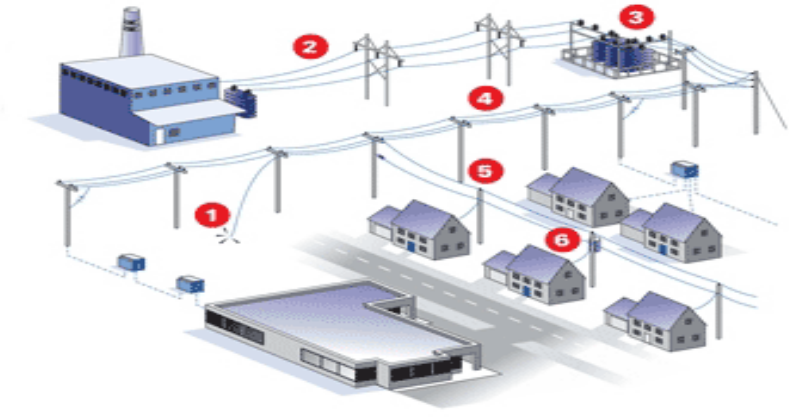
> *In order to maintain consistency across all jurisdictions in which it serves, Pepco does not customize restoration priorities with individual Emergency Management Agencies ("EMAs"). Instead, Pepco has taken steps to communicate the restoration priorities with emergency management officials, community leaders and customers. Through these discussions, Pepco gains insight into the needs of the community and will consider changes to these priorities, if warranted.*

[97] First Quartile and Silverpoint Report to the PSC, Page 102.
[98] MC Data Request 2, Q12.

Pepco identified its sequence for repairing equipment (Figure 35)[99]:

1. *Downed live wires or potentially life-threatening situations and public health and safety facilities without power.*
2. *Transmission lines serving thousands of customers.*
3. *Substation equipment.*
4. *Main distribution lines serving large numbers of customers.*
5. *Secondary lines serving neighborhoods.*
6. *Service lines to individual homes and businesses.*

Figure 35 – Pepco's Restoration Priorities, "The Power Restoration Process in Brief"[100]



During a Major Event, Pepco may have to deal with hundreds or thousands of individual outage causes impacting categories 4 – 6 (above). To determine priorities, Pepco utilizes a weighted system that scores different facilities and locations based on their criticality and importance to the community. Locations, including hospitals, have a very high weight; schools, fire stations, and other critical facilities have a high but lesser weight; and individual residences the lowest weight. When outages are greater than the resources immediately available, Pepco triages power restoration based on its weighting system. This is why outages impacting one or two homes are typically the last to be restored after a Major Event.

The Montgomery County EMG states that it generally supports Pepco's current restoration priorities, but is of the opinion that the process of developing common definitions for facilities in each category and assigning facility weights needs to be modified to include government

[99] MC Data Request 2, Q9A.
[100] MC Data Request 2, Q9A.

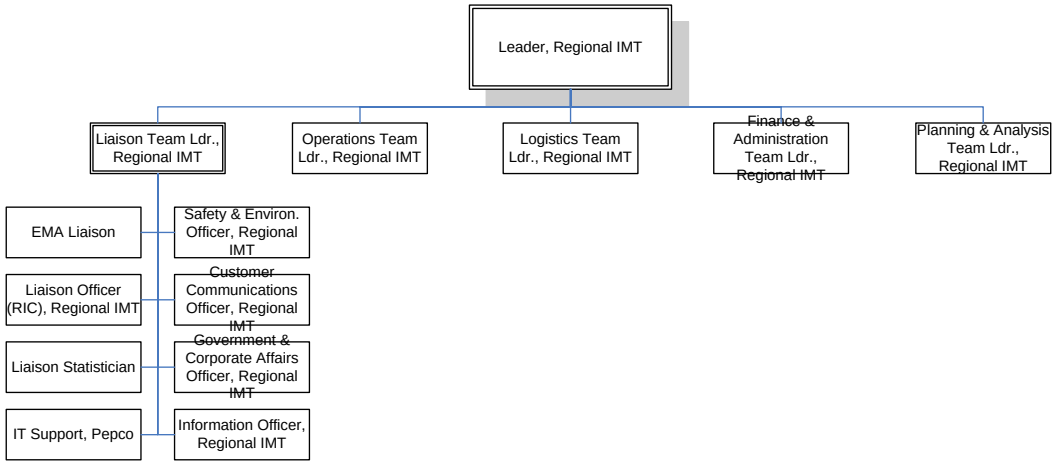
input. The EMG also asserts that after each Major Event priorities should be jointly reviewed to determine their effectiveness and to identify needed improvements. As noted elsewhere in this report, consideration should be given to modifying weightings other than Pepco's first restoration priority, "Downed live wires or potentially life-threatening situations", to reflect duration of outage (Appendix D).

6.2.3 PEPCO TRAINING AND LIAISON

Pepco has stated that it does not have the staff to send "trained" officials to the EOC. Instead, Pepco sends liaison personnel that communicate County concerns back to the Pepco Operations Center and the company then uses mutually agreed upon practices to determine priorities. Pepco has indicated there are currently nine Pepco employees assigned to the EMA Liaison Incident Response Role during storms or other emergencies (Figure 36). These individuals range in level from Senior Supervising Engineer to Group Manager and are selected based on their knowledge and experience related to Pepco field operations and restoration. Due to the varying complexity and context of outage events and the location and the availability of the liaisons, Pepco believes it is not possible or practical to permanently assign liaison personnel to particular EMAs. Assignments are made during activation of the restoration plan or if requested by an EMA[101]. This can and does result in people arriving at County emergency centers who are unfamiliar with that particular center or its personnel.

The EMA liaison person serves as Pepco's representative to state and local EMAs when those Emergency Operations Centers are activated for power related issues. The EMA Liaison individual reports to the Liaison Team Leader[102].

Figure 36 - Pepco's Emergency Response Organizational Chart[103]



[101] MC Data Request 2, Q34.
[102] MC Data Request 2, Q34.
[103] MC Data Request 2, Q34.

There is a difference of opinion between Pepco and Montgomery County regarding the necessity of Pepco liaison personnel attending county-sponsored training and exercises. According to the OEMHS Division Chief, **"**The County conducts monthly drills on the primary information sharing tool utilized in the EOC during emergencies. Since January 18, 2010 no Pepco staff member has attended training." (As of April 15, 2011)

These interactions are needed to meet Montgomery County's minimum training and exercise requirements if the activities are to be effective during emergencies. Montgomery County provides training and exercises free of charge and suggests the level of effort needed annually to participate in its EMG program is approximately 64 hours the first year and 32 hours each year thereafter. Some of the specific training that the County views as critical includes courses on Montgomery County's information sharing system, WebEOC, and on the Incident Command System (ICS). Annual exercises include both table-top and functional simulations where these systems respond to mock disasters

6.2.4 EMERGENCY OPERATIONS CENTER

When Pepco was asked about collaboration with Montgomery County, Pepco responded[104]:

> *A reluctance by some agencies to use the established County Emergency Operations Center as a coordination point with supporting agencies as well as for the prioritization of requirements based on overall community needs and not the individual agency.*

The Work Group found that some incorporated municipalities are not participating in the Montgomery County's EMG calls, and as a result are attempting to contact Pepco directly by telephone or email during Major Events. It is not a sound practice from either Pepco's or Montgomery County's standpoint for individual agencies to contact Pepco directly with specific requests. It appears that coordination during Major Events can best be conducted through Montgomery County's EOC.

6.2.5 EMERGENCY RESPONSE PLANS

The Work Group is not aware of any notification system, plan, or process within Pepco to consistently inform government of outages and their consequences. Pepco provided the following response when asked if they were willing to develop a notification system[105]:

> *Pepco has evaluated technology for a notification system and plans to deploy this capability for individual customers as part of the functionality and customer benefits of the Advanced Metering Infrastructure (AMI) in Maryland. While this capability would be available to individual customers only, Pepco could develop a separate method to send alerts to County officials and will further evaluate this option if requested by the County.*

The Work Group supports Pepco developing a notification system for appropriate government agencies for both Major and Non-Major Events and believes that government agencies would

[104] MC Data Request 2, Q7.
[105] MC Data Request 2, Q24.

best be served by notification of outages exceeding thresholds based on the number of outages, ETRs, and the criticality of the facility to County and citizen public safety and welfare.

Effective emergency response plans require coordination between agencies responsible for response efforts, and not just Pepco working independently. Currently, Pepco does not share its emergency response plans with the County. When the County requested the emergency response plans Pepco utilizes during Major Events, Pepco did not provide its Incident Response Plan. The County allows public access to its Emergency Operations Plan (EOP). This is an unacceptable situation.

6.2.6 REGULATIONS AFFECTING ACCESS FOR VEGETATION MANAGEMENT

According to Pepco[106] (and the PSC Consultants' Report[107]), vegetation management is the primary cause of Pepco's reliability problems in Maryland. As stated by Pepco:

> *Vegetation is the largest cause affecting overhead electric distribution reliability, specifically the impact of trees and tree limbs falling into the Company's overhead conductors and associated overhead electric plant including transformers, switches, cross arms, fuses, and lightning arrestors.*

Although the Work Group considers the above statement to be a bit of an overall generalization, it nonetheless concurs that vegetation is the primary cause of outages during Major Events. The majority of vegetation management consists of tree trimming which does not require a permit, for example, on public right-of-ways (ROWs). Other vegetation management consists of the removal of a tree; this requires a Roadside Tree Removal Permit from the Maryland Forest Service and approval from either the private property owner or ROW owner.

Pepco asserts increased authority to enter private property to remove trees would enhance its vegetation management program[108]:

> *To gain the best result from its vegetation management plan, the Company needs increased authority to enter private property to remove private trees and the cooperation of government entities that manage and own public rights of way ("ROW").*

Montgomery County should maintain a balance between protecting the private property rights of residents and ensuring the removal of trees that pose a threat to electrical reliability for the community. In the view of the Work Group, there are instances when the preferences of individual residents will have to be compromised in the interest of providing electric power to the community.

[106] MC Data Request 2, Q2A.
[107] First Quartile and Silverpoint Report to the PSC, Page 19.
[108] MC Data Request 2, Q2A.

Pepco has also indicated issues with respect to cooperation of government entities that manage and own ROW. According to Montgomery County officials, Pepco requested the removal of 1,426 County ROW trees over the last year. Of that total, 19 trees were denied removal by Montgomery County arborists. Montgomery County officials stated that data previous to last year are not available, but that Pepco requested substantially fewer removals in calendar years 2008 and 2009. It is the Work Group's view that the County Executive and County Council should review funding levels for Montgomery County Department of Transportation (DOT) vegetation management programs to ensure sufficient funding to support maintenance of reliable electrical systems in the County.

Progress has been made in the area of streamlining the permitting process, as suggested by the following response by Pepco to one of the Work Group's questions[109]:

> *To speed up the permitting process, Pepco has implemented a procedure where a contractor forester meets on site with the ROW owner to review all proposed public space tree removals prior to submitting the Roadside Tree Removal Application to the Maryland Forest Service so that every tree on the application has already been approved by the ROW owner. If the ROW owner refuses to approve the requested tree removal, the owner is identified as a Sensitive Customer in the VM GIS planning tool. This has reduced the turn around time for Roadside Tree Removal permits from 90 days to between 15 and 30 days. Nearly every feeder is constructed on multiple roads owned by different municipalities so Pepco frequently has to meet with multiple municipal arborists prior to submitting the permit application.*

6.3 RECOMMENDATIONS

1. ***Pepco should provide to Montgomery County government and municipal governments timely notification regarding significant outages and planned activities that impact Montgomery County and municipal infrastructure.***

   While many utilities, including other electric utility companies servicing Montgomery County, have processes to notify government and use Geographic Information System (GIS) extensively, Pepco has not embraced proactive notification and instead relies on government and residents to access its website to gather further information after learning of an outage from other sources. Establishing proactive measures over the current reactive approach will decrease the impact of outages on Montgomery County and its residents.

   Consistent with the PSC Consultants' Report recommendation, Pepco should implement a proactive, comprehensive, and clear communication of standardized, structured emergency operations status that includes the details of its outage preparation/mobilization, response, and restoration efforts[110].

2. ***Pepco should provide real-time GIS information to County government during Major Events.***

[109] MC Data Request 2, Q16D.
[110] First Quartile and Silverpoint Report to the PSC, Page 118.

Shortly after a significant event, Montgomery County begins making decisions to open shelters and on how best to deploy its resources. Without information identifying where the most affected areas are, Montgomery County is often required to spread resources equally and or centralize services into the middle of the County.

3. ***Pepco and Montgomery County government and municipalities working together should design and implement an effective after-action assessment program.***

   The establishment of a regular "lessons-learned" process can enhance the capability of both the County and Pepco to serve the community.

4. ***The Montgomery County Department of Transportation should send Pepco Storm Operations Reports.***

   The Storm Operations Reports should be provided to Pepco's emergency manager and include notification of all likely significant storm events and the emergency response status to trigger Pepco's prompt response plans, crews and key staff coordination. These reports should also include a reference to Department of Transportation's new Website Storm Application Face Mapping (Road Closure Icons).

5. ***All incorporated municipalities should participate in EMG conference calls.***

   During previous Major Events, incorporated municipalities when acting independently have been unable to obtain information about Pepco's restoration priorities and ETRs.

6. ***There should be a written process agreed upon by Montgomery County, municipalities and Pepco for updating and implementing the weighting system used in setting power restoration priorities.***

   Montgomery County, municipalities, and Pepco should develop a customer weighting system and a set of common definitions. The weighting system should be updated at least once every four years.

7. ***Pepco should share with EMG representatives the priority weightings of each substation and feeder.***

   The above information is important for determining the consequences of specific feeder outages. It is recommended for each substation and feeder that the following be provided: a substation or feeder identifier currently utilized by Pepco; the total weighted value; the number of each customer type serviced; and predictive modeling showing the approximate estimated time of restoration based on historical events for each feeder (e.g., Hurricane Isabel, July 25, 2010 severe weather event, February 5, 2010 snow storm, etc.).

8. ***Pepco and Montgomery County EMG members should develop a plan for tiered deployment of resources for timely response to critical road closure locations.***

The best response to emergency conditions is a coordinated strategy and mutual exchange of technology-driven information. The strategy should establish priorities and sharing responsibility for intersections without power. The plan should also include the grouping of locations where trees are down.

9. ***Pepco should annually identify at least three of its employees who will participate in Montgomery County EMG training. These same, trained, employees should serve as EOC liaisons during Major Events.***

   Pepco needs to ensure there is a sufficient number of its liaisons to Montgomery County and that those liaisons have the appropriate training on how to work effectively during EOC activations.

10. ***Pepco should include Montgomery County EMG representatives in its emergency response exercises and drills.***

    At least annually, Pepco should include Montgomery County officials in one exercise to ensure Pepco is making realistic assumptions regarding the County's actions and priorities and that County representatives are familiar with limitations on Pepco's response capacity.

11. ***Pepco should be granted the authority to conduct essential vegetation management on private property. In cases where these activities are disputed, the Work Group recommends the establishment of an independent arbitrator to mediate conflicts in a timely manner.***

    Granting Pepco private property authority after appropriate review could increase the utility's ability to conduct vegetation management and enhance overhead electrical reliability. The establishment of an independent arbitrator would serve as an unbiased third party that could resolve the issues associated with private property rights and trees threatening the utility's electrical reliability. While any apparent infringement on private property is obviously distasteful to the individuals involved, so too is the lack of electric power to the community.

APPENDIX A – Work Group Biographies

Norman R. Augustine, Chair

Norman Augustine has held positions in government, industry, academia, and the not-for-profit sector. He has served as under secretary and acting secretary of the Army, chairman and Chief Executive Officer (CEO) of Martin Marietta Corporation and later chairman and CEO of Lockheed Martin Corporation, and professor at Princeton University. He has been chairman of the National Academy of Engineering, the Defense Science Board, the American Red Cross, and the Aerospace Industries Association, served as president of the Boy Scouts of America and the Institute of Aeronautics and Astronautics and was a 16-year member of the President's Council of Advisors on Science and Technology and is a member of the Secretary of Energy's Advisory Board. He is a Regent of the University System of Maryland, a former trustee of the Massachusetts Institute of Technology (MIT) and Princeton University, a trustee emeritus of Johns Hopkins and holds 25 honorary degrees. His honors include the National Medal of Technology and the Vannevar Bush Award, and he is a five-time recipient of the Defense Department's Civilian Distinguished Service Medal. He is a Life Member of the Institute of Electrical and Electronic Engineers.

Born in Colorado in 1935, Mr. Augustine graduated magna cum laude from Princeton University, where he was elected to Phi Beta Kappa, Sigma Xi and Tau Beta Pi honorary societies and earned Bachelor's and Master's degrees in aeronautical engineering.

Gerald J. FitzPatrick, Ph.D.

Jerry FitzPatrick is the leader of the Smart Grid project in the National Institute of Standards and Technology (NIST) Physical Measurements Laboratory, and member of the NIST Smart Grid Team supporting NIST efforts to fulfill its mandate given by the 2007 Energy Independence and Security Act (EISA) for the Smart Grid. He is the NIST lead on the Transmission and Distribution (T&D) Domain Expert Working Group (DEWG) which is examining interoperability issues and standards for T&D. Dr. FitzPatrick is a Past Chair of the Institute of Electronic and Electrical Engineers (IEEE) Power Engineering Society Power Systems and Instrumentation Committee.

Dr. FitzPatrick formerly led the Applied Electrical Measurements (AEM) at NIST. The Group conducts research in precision measurement of electric power and energy, maintains the national standards, and provides measurement services for standard electrical power and energy meters. Prior to leading the AEM Group, Dr. FitzPatrick led a project in Electric Power Metrology, and conducted research in the precision high voltage measurements that supported standards development for testing of electrical insulation and power equipment.

He received a Bachelor of Science (B.S.) degree in Physics from Rutgers University in 1979, a Masters of Science (M.S.) in Electrical Engineering from the New Jersey Institute of Technology in 1984, and a Ph.D. degree in Electrical Engineering from the State University of New York at Buffalo in 1988.

Michal Ilana Freedhoff, Ph.D.

Michal Ilana Freedhoff is the Policy Director for Congressman Edward J. Markey (D-MA). She is also Senior Investigator and Policy Coordinator for the House Natural Resources Committee, staffing Rep. Edward J. Markey (D-MA) as the Ranking Minority Member of the committee.

Dr. Freedhoff has been a Congressional staff member almost continuously since 1996, when she was awarded a Congressional Science and Engineering fellowship and spent her fellowship year working for Rep. Edward J. Markey (D-MA) with responsibility for nonproliferation, energy and environmental issues. After her fellowship, she spent 2.5 years as Professional Democratic Staff for the House Science Committee, with legislative and oversight responsibility for civilian Department of Energy Research and Development, and intellectual property and other health, societal and research issues associated with genomics. In July 2001, she returned to work for Congressman Markey, and works primarily on energy and environmental issues, which most recently have included leading investigative and legislative efforts related to the Japanese nuclear meltdown and the BP oil spill, and legislative efforts to deploy electric vehicles, secure chemical and water facilities, and reduce U.S. dependence on oil.

She received her Bachelors of Science in physical chemistry from McGill University in 1991 and her Ph.D. in physical chemistry from the University of Rochester in 1995.

Keith Haller

Keith Haller has served as President and CEO for Potomac Incorporated. Potomac Incorporated is a leading strategic communications, public affairs, and market research firm in the Washington region. Haller has produced award-winning public service announcements for gun safety, teenage driving, AIDs awareness, environmental education and cable theft. His advertising awards have included an *Emmy*, a *Telly*, Showtime's *Cable Positive*, and a *Summit*s. Mr. Haller won the *Silver Anvil* award from the Public Relations Society of America for the firm's work with "Save Our Doctors, Protect Our Patients."

Before launching Potomac Incorporated, Mr. Haller served as Executive Vice President for the Center for National Policy, a national think tank focused on alternative public policies. He also worked on Capitol Hill as chief of staff to Congressman Michael Barnes, Democrat from the 8th congressional district in Maryland. From 1974 to 1978, Mr. Haller served as Executive Director for the National Democratic Forum and Editor of the National Democratic Review.

Mr. Haller has served on the boards of many community and business organizations, including the Universities of Shady Grove, Maryland and Montgomery Chambers of Commerce, Leadership Maryland, Corporate Leadership Council, and the Potomac Conference. Leadership Washington recently honored him as one of its founders. He resides in Rockville, Maryland with his wife, Stacy, President and CEO of the American Health Assistance Foundation, and their son, Michael.

Scott Hempling, J.D.

Scott Hempling is the Executive Director of the National Regulatory Research Institute, a nonprofit organization created to "empower utility regulators to make public interest decisions of the highest possible quality."

He has taught regulatory law and policy to a generation of practitioners and decisionmakers, from all fifty states and many foreign countries. In addition to his coursebook, *Fundamentals of Electricity Law*, he has authored articles and research papers on mergers and acquisitions, the introduction of competition into formerly monopolistic markets, utility investments in non-utility businesses, renewable energy, transmission access, State-federal jurisdictional issues, community purchasing, stranded costs, renewable energy, and integrated resource planning.

Mr. Hempling has counseled regulatory commissions on all phases of administrative practice, from data collection to appellate review. As an expert witness, he has testified before committees of the U.S. Congress, state legislatures and utility commissions. He has addressed professional conferences throughout the United States and in Canada, Chile, India, Jamaica and Nigeria.

He earned a Bachelors of Art (B.A.) cum laude from Yale University, majoring in Economics and Political Science and in Music, and receiving a Continental Grain Research Fellowship and Patterson research grant. He earned a J.D. magna cum laude from Georgetown University Law Center, receiving an American Jurisprudence award for Constitutional Law.

Brian Lang

Brian Lang is Senior Vice President and Partner of Guardian Realty Investors, one of the largest private institutional real estate investment trust and investment vehicles in Washington, D.C., Suburban Maryland (Montgomery and Prince George's Counties, Columbia and Towson), and Virginia (Arlington, Fairfax County, Virginia Beach and Norfolk). The Firm has been acquiring, developing, financing, leasing and managing office buildings for over 60 years. Mr. Lang has been responsible the acquisition and ground up development of millions of square feet of commercial office buildings.

Prior to Guardian, Mr. Lang worked in the Manhattan (New York City) office of Deloitte Touche, Audit/Consulting Group. He performed mass modeling for more than $500,000,000 of Collateralized Mortgage-backed Obligations (CMOs) and Asset Backed Securities (ABSs).

Mr. Lang currently holds a B.A. and B.S. with Master's work specifically in statistics and finance. He was born in Rockville, Maryland and has been a resident of Montgomery County for more than 30 years where he continues to reside with his wife and two children.

Carmen Larsen

Ms. Larsen founded and manages AQUAS, Inc. in Bethesda, Montgomery County, Maryland, since 1990. AQUAS, Inc. (www.aquasinc.com) is an operational consulting, engineering, and technology firm focused on business performance, quality, case and inspection management, and transit systems support. AQUAS customers include the U.S. Agency for International Development (USAID), the U.S. Department of Agriculture (USDA), the U.S. Nuclear Regulatory Commission, Veterans Health Administration, U.S. Health and Human Services, the Washington Suburban Sanitary Commission, Southeastern Pennsylvania Transit Authority, and the Metropolitan Washington Airport Authority. Ms. Larsen currently provides quality and safety inspection solutions in governance, food and agriculture, transportation, education, health care, and urban infrastructure. Her company received a Maryland Top 100 Minority Business Enterprises (MBE) award in 2007, and the 2006 woman-owned small business award from the USDA Animal and Plant Health Inspection Service APHIS and the Agricultural Marketing Service.

Ms. Larsen has managed small businesses since 1979, and was previously a Principal at now CGI (formerly AMS Inc.) and SRA International Corporation, management consulting firms in Northern Virginia.

She holds a university degree in Physics from Georgetown University in Washington D.C., and has undertaken studies in international law and business management at American University, Northwestern University, and Dartmouth. Ms. Larsen has been a resident of Montgomery County since 1969.

Steve Richter

Mr. Richter is the President of Richter & Associates, Inc., a company that develops, designs, and manages the installation, relocation, and removal of utility lines for new and existing projects in Maryland, Virginia and Washington D.C. This utility work includes electric, telephone, natural gas, and cable television services. Mr. Richter's company is under contract to perform work for many local and national builders and developers of residential and commercial properties.

Prior to becoming President of Richter & Associates, Inc. in 1989, Mr. Richter spent 10 years as an electric service engineer at Pepco where he designed and scheduled electric service installations for residential and commercial service installations throughout Montgomery County. He also prepared annual company budgets for the Underground Residential Distribution (URD) Services section.

Mr. Richter received his Bachelors of Electrical Engineering from Catholic University in 1979.

Debra Sadugor Robins

Debra Sadugor Robins is the CEO/President of Century Distributors, Inc., a family-run full service products distributor covering the Baltimore/Washington Metropolitan Area, employing over 180 individuals and serves over 3,000 retailers. She has been with Century Distributors since 1987 and has held a variety of positions. Debbie was employed by Nabisco Brands before returning to her roots at Century.

Mrs. Sadugor Robins has served on many boards and committees throughout the distribution industry including the American Wholesale Marketers Association, National Confectioners Association Buyer Advisory and Manufacturer Board and Maryland Association of Candy and Tobacco Distributors. She is currently serving on the General Mills Advisory Board and the Wholesale and Manufacturer Advisory Board. Mrs. Sadugor Robins was the recipient of the Candy Buyer of the Year Award in 2006.

She has B.A. in Business Administration from Simmons College in Boston, Massachusetts and has participated in the Philip Morris Executive Leadership Forums and has attended several Wharton School Executive Education Programs. Mrs. Sadugor Robins lives in Potomac, Maryland with her husband, Steven.

Arthur E. Slesinger

Arthur Slesinger worked for 40 years in the environmental and safety field and was employed by major chemical, manufacturing, and pharmaceutical companies. The latter half of his career was spent as Director of Environmental Affairs and Safety for Morton-Thiokol (later Morton International) and Corporate Director of Environmental Affairs and Safety for the privately held German pharmaceutical company, Boehringer Ingelheim. He retired from the Boehringer organization in 2007 after 15 years of service.

Mr. Slesinger is recognized as a Qualified Environmental Professional by the Air and Waste Management Association. He headed the Connecticut Business and Industry Association Environmental Policy Council in 2000 and 2001.

Mr. Slesinger holds degrees in Chemical Engineering (Bachelors and Masters) from Cornell University and a Master's degree from New York University in Environmental Health Sciences.

Scott Ullery

Scott Ullery has served as Rockville's city manager since November 2004. Mr. Ullery has 32 years of municipal government experience, with 17 years in appointed senior executive positions. He is also currently the Treasurer and a member of the executive committee of the Maryland City/County Management Association, and served as that organization's representative to the Maryland Municipal League's Legislative Committee during the 2008 and 2009 state legislative sessions.

Prior to coming to Rockville, he was deputy county administrator for Santa Barbara County, California (1997-2004) and assistant city manager for the City of Tucson, Arizona (1994-1997). His experience in Tucson and Rockville include executive responsibilities for full service municipal water utilities. Mr. Ullery began his local government career in 1979 with the City of Tucson's budget and research department.

Mr. Ullery is an International City/County Management Association Credentialed Manager. He received his B.A. in Government from the University of Arizona, and is a graduate of the University of Arizona Eller School of Management Executive Development Program and the University of Virginia Darden Business School Senior Executive Institute. Mr. Ullery and his wife, Cathy, reside in Rockville.

Jim Young

Mr. Young is currently the Senior Director of Corporate Facilities and Real Estate for Marriott International in Bethesda, MD. In addition to ensuring the functionality of over one million square feet of Marriott's Headquarters campus in Bethesda, Gaithersburg, and Chevy Chase, he oversees the administration of Marriott's non-hotel real estate leases around the world.

For over 20 years Mr. Young has been involved in the development and operation of hotels around the country for brands like Choice, Hilton, La Quinta, and Marriott. Mr. Young has represented Marriott in matters concerning transportation, sustainability, and energy in Montgomery County. He serves as Vice President of the board of the Transportation Action Partnership of North Bethesda and Rockville.

Mr. Young graduated from West Chester University and the University of Maryland and holds degrees in education and business. He has taught public school in Whitemarsh, PA and Montgomery County, MD.

APPENDIX B – Additional Customer Relations Data, Reports, and Public Comments

B.1 PURPOSE

The Work Group thought additional information related to the costs of outages and the willingness of Pepco's customers to pay for investments in reliability measures through rate increases would be valuable. Thus, two online surveys were developed—one for residential customers and one for commercial customers. Responses were collected from January 7, 2011 to February 14, 2011, and 10,895 residential and 654 commercial entities responded who were both Montgomery County residents and Pepco customers.

B.2 ADDITIONAL DATA

B.2.1 PEPCO WORK GROUP SURVEY

While the Work Group was well aware of Pepco's customers' intense frustration at Pepco's performance, it felt that it would be important to seek out additional information related to the costs of outages and the willingness of Pepco's customers to pay (through rate increases) for investments in reliability measures.

While the design and execution of any online survey has its limitations[111], the data provides very useful information that can serve as a guide for both assessing the economic impacts associated with long outages as well as the degree to which policy choices made by legislators are likely to be supported by Pepco's customers.

- Almost 95 percent of Montgomery County Pepco customers who responded to the Work Group survey reported that they had experienced at least one outage of more than five hours in the past year. About 50 percent of Montgomery County Pepco customers who responded to the Work Group survey also reported that they had experienced Non-Major Event related outages of more than one hour in the past year.
- The economic costs of long outages experienced in the past year can be estimated, based on reports obtained from survey respondents, to be a total of $22.9-$114.6 million for residents in Montgomery County and $21.1 - $211 million for businesses. Pepco's Montgomery County customers appear to be incurring outage-related costs that are on the same order of magnitude as Pepco's 2010 earnings of $139 million[112].

[111] Because the individuals who respond to such surveys are self-selected as opposed to randomly selected, there is no way to ensure that people respond only one time, etc.

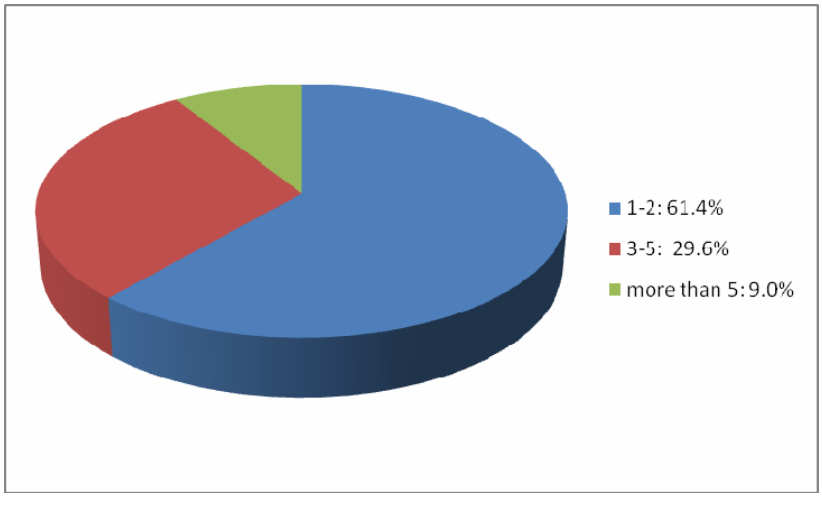
[112] Pepco Holdings Inc. (February 25, 2011). Financial Release: *Pepco Holdings Reports Full-Year and Fourth-Quarter 2010 Earnings; 2011 Earnings Guidance Announced*. Retrieved from http://phx.corporate-ir.net/phoenix.zhtml?c=62854&p=irol-newsArticle&ID=1533010&highlight=.

- There were 10,430 residential respondents, or 95.7 percent, that experienced one or more outages of longer than five hours in the past year. Of these respondents, almost 65 percent reported calling Pepco more than twice to check the status of the outage. Only five percent of Pepco's residential customers reported that they didn't attempt to call Pepco at all. Of those who experienced long outages, 85.5 percent incurred costs or other economic losses that they otherwise would not have incurred.
- There were 609 commercial respondents, or 94.9 percent, experienced one or more outages of longer than five hours in the past year. Of those who experienced long outages, 83.3 percent incurred costs or other economic losses that they otherwise would not have incurred.

Blue Skies Experience

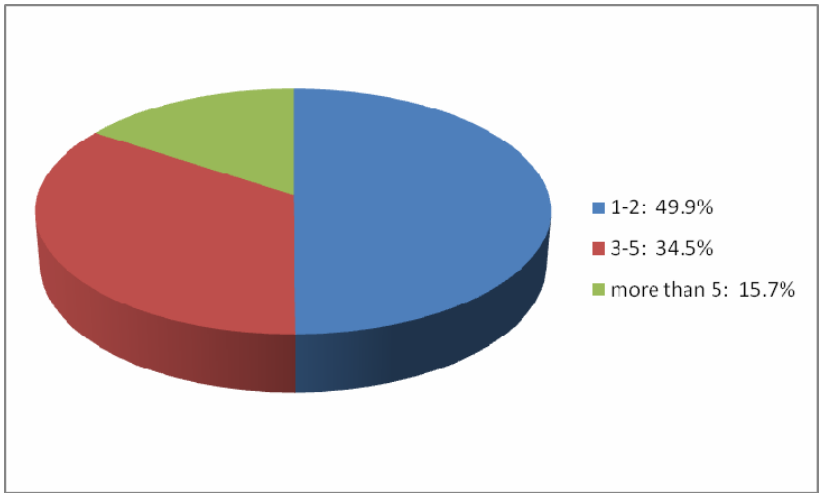
Of the residential customer respondents, 51 percent reported experiencing outages of longer than one hour that were not associated with a storm or other major event. See Figure B1 in this appendix (Appendix B1) for a look at how many such outages were experienced.

Figure B1: How Many Shorter Outages were Experienced by Residential Customers



Of commercial customer respondents, 54 percent also reported experiencing outages of longer than one hour that were not associated with a storm or other major event. See Figure B2 in this appendix for a full depiction of the number of such outages experienced.

Figure B2: How Many Shorter Outages were Experienced by Commercial Customers

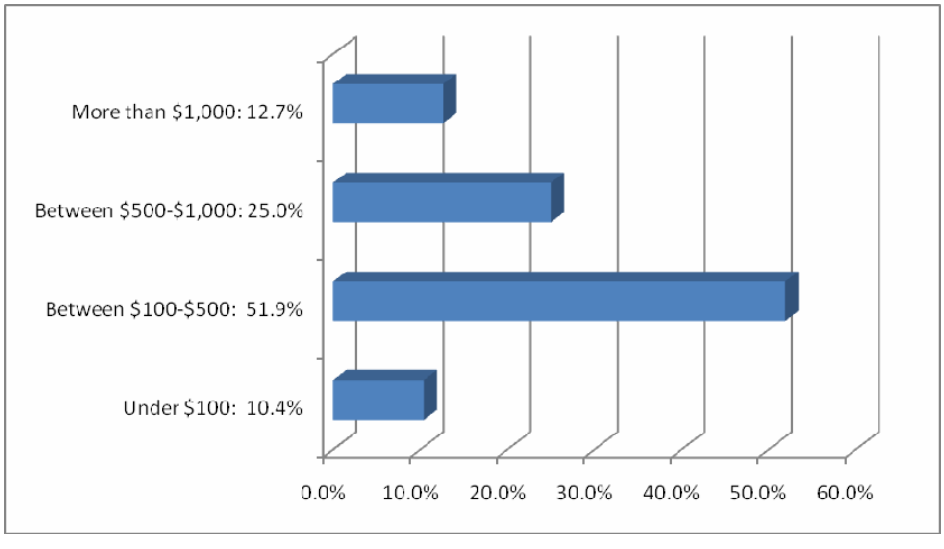


Costs of Outages

The median costs to residential customers reporting costs associated with outages was $100-500, with 51.9 percent of those who experienced losses reporting this range for the magnitude of those losses (Figure B3 in this appendix). If this value is extrapolated to all 280,003 of Pepco's residential customer base (as adjusted to reflect the 95.7 percent of residential customers who reported that they experienced long outages and the 85.5 percent of those who reported that they incurred economic losses), then one can roughly conclude that the costs to Montgomery County residents of outages in the past year is $22.9-$114.6 million.

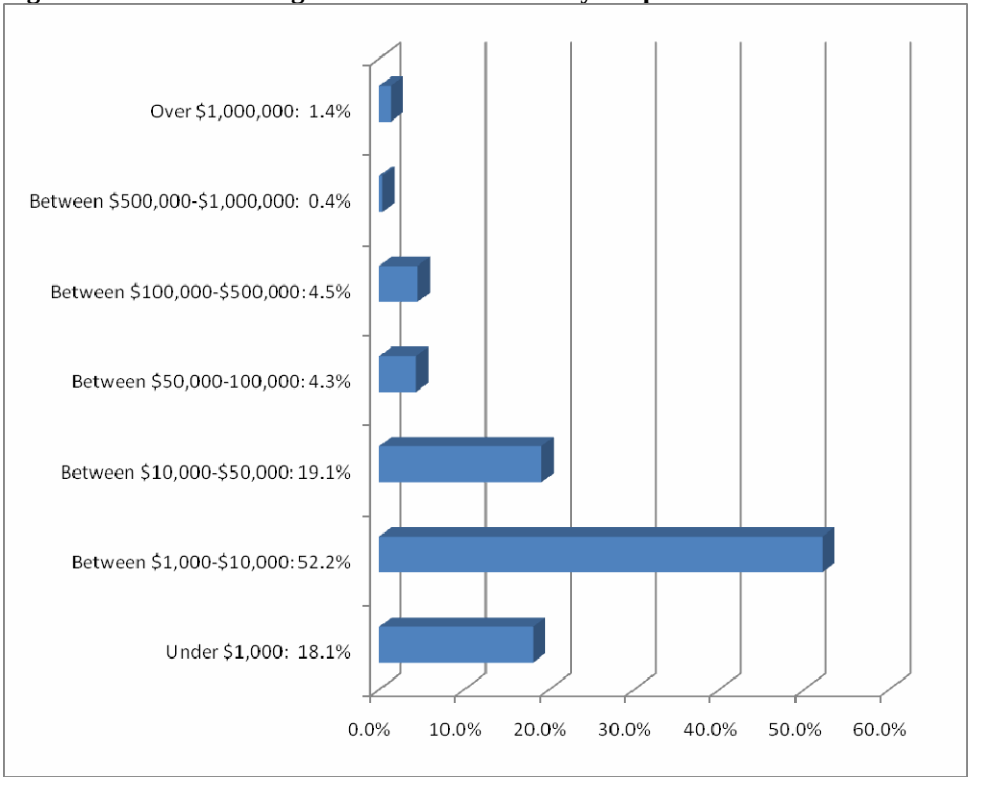
Put another way, if these costs were distributed among all of Pepco's residential customers and expressed as a monthly charge, the cost of outages to residential customers would be $6.82-$34.09/month, far in excess of the $1.25/month that Pepco's reliability plan is expected to cost. It is unclear whether Pepco's reliability plan will be sufficient to either achieve first quartile performance or comply with as-yet unspecified reliability standards. It is also certain that no matter what these standards are, long outages (and the costs associated with them) will continue to occur. But this comparison is nevertheless an illustrative means of describing the considerable economic costs that outages cause.

Figure B3: Costs of Outages to Residential Survey Respondents



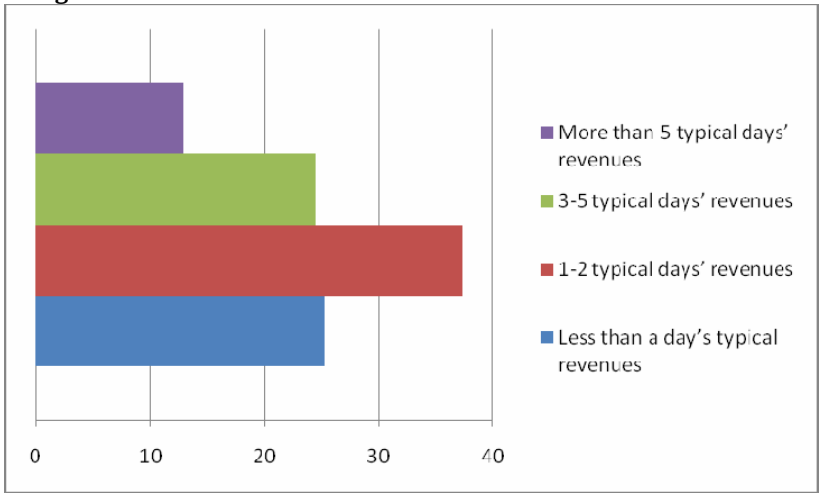
The median costs to commercial customers reporting costs associated with outages was $1,000-10,000, with 52.2 percent reporting this range as the magnitude of their losses. See Figure B4 in this appendix for the full response to this question. If this is extrapolated to all of 26,691 Pepco's commercial customer base (as adjusted to reflect the 94.9 percent of commercial customers who reported that they experienced long outages and the 83.3 percent of those who reported that they incurred economic losses), then one can roughly conclude that the costs to businesses of outages in the past year is $21.1- $211 million.

Figure B4: Costs of Outages to Commercial Survey Respondents.



More than 91 percent of the commercial respondents (589 out of 642) reported that they employ under 100 employees, and 55 percent of these companies reported losses of between $1,000-10,000. The relative magnitudes of these losses as a function of a typical day's revenue for these companies is depicted in Figure B5 in this appendix.

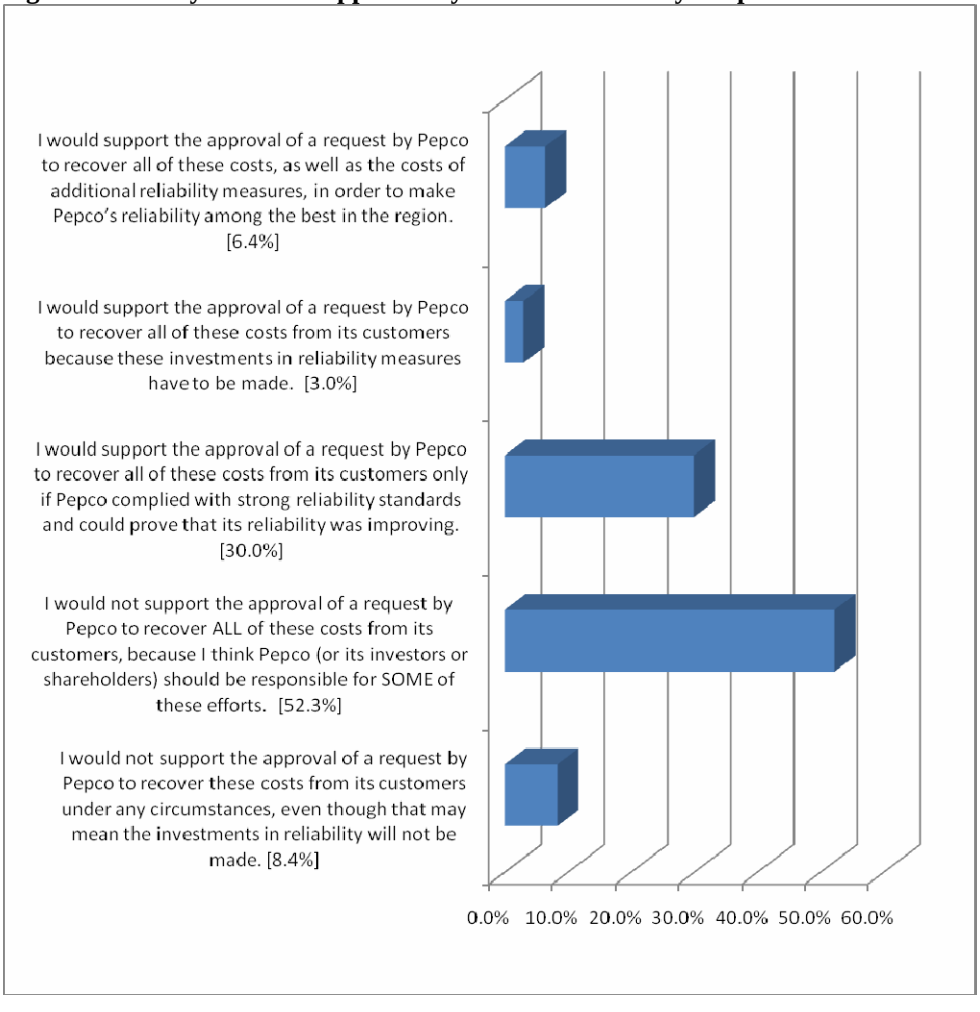
Figure B5: Percent of commercial respondents who reported economic losses due to long outages.



Policy Choices Preferred by Customers

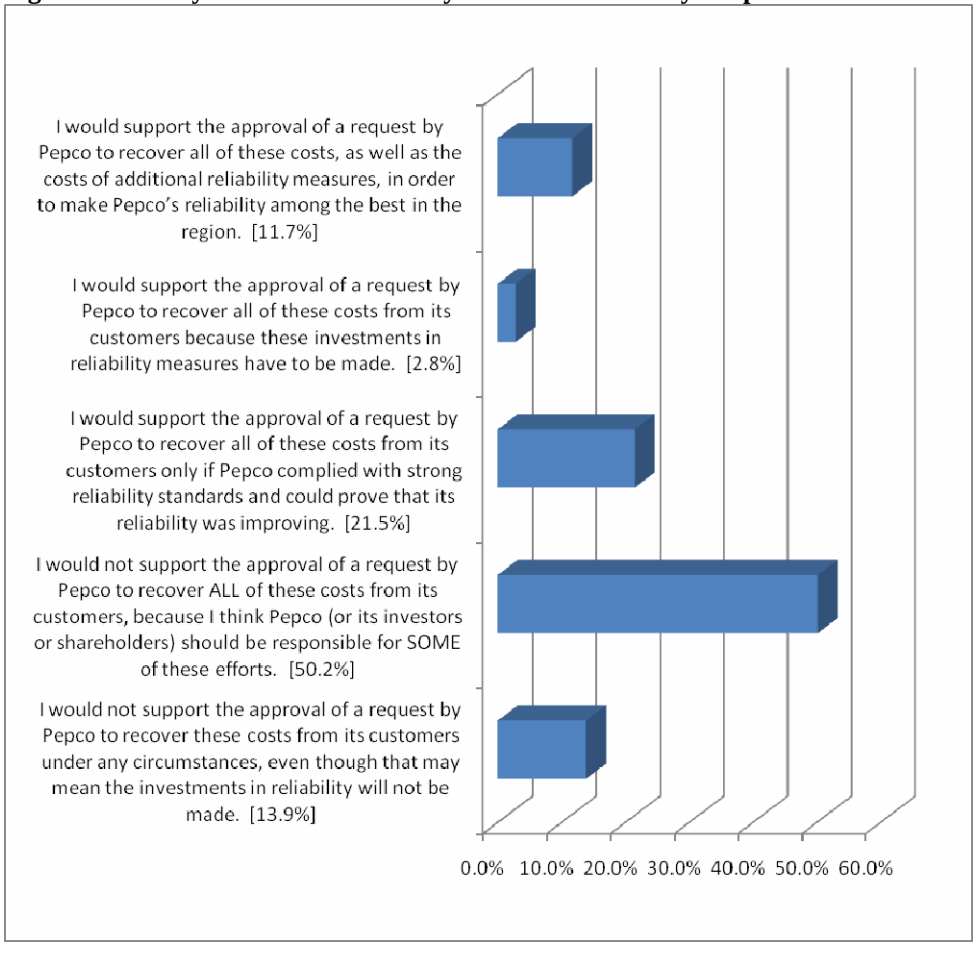
More than 52 percent of residential respondents indicated that they would *not* support a request by Pepco to recover all the costs of reliability investments from ratepayers, believing that Pepco's investors or shareholders should pay for some of the costs, and 30 percent would only be willing to pay for the investments if Pepco had to comply with strong reliability standards. The full response to this question is depicted in Figure B6 in this appendix.

Figure B6: Policy Choices Supported by Residential Survey Respondents



More than 50 percent of commercial respondents indicated that they would *not* support a request by Pepco to recover all the costs of reliability investments from ratepayers, believing that Pepco's investors or shareholders should pay for some of the costs. More than 21 percent of commercial customers would support a request to recover costs of reliability improvements from ratepayers only if Pepco complied with strong reliability standards. The full response to this question is included in Figure B7 in this appendix.

Figure B7: Policy Choices Preferred by Commercial Survey Respondents



B.2.2 COSTS OF OUTAGES TO MONTGOMERY COUNTY RESIDENTS AND BUSINESSES

The median costs to residential customers reporting costs associated with outages was $100-$500, with 51.9 percent (Figure B3) of those who experienced losses reporting this range for the magnitude of those losses (Figure B8).

Figure B8 – Summary of Survey Results related to Outage Costs (Residential)

	Under $100	Between $100-$500	Between $500-$1,000	More than $1,000
Number of responses	929	4,628	2,230	1,128
Cumulative	929	5,557	7,787	8,915
Cumulative (percentile)	10%	62%	87%	100%
The median (50th percentile) is between $100-$500				

The median costs to commercial customers reporting costs associated with outages was $1,000-$10,000, with 52.2% reporting this range as the magnitude of their losses (Figure B9 and B10).

Figure B9 – Commercial Impacts related to Outages

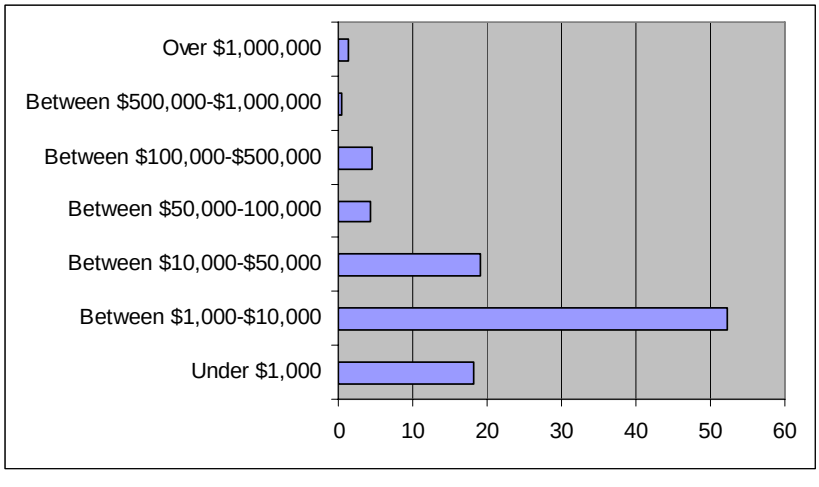


Figure B10 – Summary of Survey Results related to Outage Costs (Commercial)

	Under $1,000	Between $1,000-$10,000	Between $10,000-$50,000	Between $50,000-100,000	Between $100,000-$500,000	Between $500,000-$1,000,000	Over $1,000,000
Number of responses	92	264	97	22	23	2	7
Cumulative	92	356	453	475	498	500	507
Cumulative (percentile)	18%	70%	89%	94%	98%	99%	100%
The median (50th percentile) is between $1,000-$10,000							

B.2.3 CUSTOMER FEEDBACK ON PEPCO SERVICE

In the "Quality of Customer Service during Normal Operations," section 4.2.5 of this report, **the Work Group argues that the adequacy of customer call efforts should not be based primarily on how quickly a call is answered, but rather on the quality and accuracy of the information exchanged between the customer and the utility.** This was reiterated in comments submitted to Montgomery County by Pepco's customers. One example:

> *During the past summer's storm, and again this week, the same transformer on our block, the ADDRESS, blew out each time. This past week, it flamed out. Each time neighbors who saw it flame tried to tell Pepco that it is always the same transformer, the same problem. There is no one to tell. The phone messages don't allow for this type of report.*

Another example of the inadequacy of customer call efforts from a comment submitted to Montgomery County:

> *I live near what I believe to be a transformer or similar device that is related to the distribution of power. This device has frequently emitted banging noises and flashes of light -- followed by the power flashing off and on -- that shows that it is malfunctioning. Often, power outages are very brief. They are more frequent in bad weather but can occur at any time. They have preceded longer power outages, but not always. During the last outage, a bang and flash occurred, the power was out for about an hour. It then went back on again. Twenty minutes later, it was out again (more than 10 hours) without any noise or flash. I had reported the earlier outage. When I called back to report the second one, PEPCO's automated system would not allow me to. It said I had already reported the outage. Thus, PEPCO is not even collecting complete information about outages that occur. Its automated system is limited. Clearly, this device needs some kind of repair or maintenance. I have tried to report it to PEPCO, but they only take automatic phone calls. I have never been able to figure out if PEPCO is aware of this problem. I did send them a "contact us" email through their website, but received only an automated reply.*

B.2.3.1 - Illustrative comments received by Montgomery County regarding customer relations problems experienced by Pepco customers, as well as of the potential consequences of these problems.

Since Hurricane Isabel hit the area in the summer of 2003, there has been an increasing level of attention paid to the manner in which Pepco has responded to major storm events. What follows below is a summary of customer relations related issues that arose in most of the major outages to impact Montgomery County since Hurricane Isabel, as well as Pepco's response thereto. The information is drawn from Major Storm Reports that utilities are required to submit to the PSC following major outages, media reports surrounding major outages, written input from more than 900 Montgomery County Pepco customers, and data obtained at a January 5 2011 Public Meeting of the Work Group at which 17 individuals made presentations.

One of these submissions struck the Work Group as highly illustrative of both the nature of the customer relations problems experienced by Pepco customers, as well as of the potential consequences of these problems. It is reproduced below[113].

> *We live in the Wood Acres neighborhood of Bethesda. We were without power for NINE DAYS after the summer storm. A tree limb came down and took down the drop line that serves our house and our neighbors' house. It also tore the I-bolt and the wires and our meter off of our house. We had live wires that landed on my minivan, went over it down my driveway, and hung 2'-3' above the asphalt across our road, XXX, which I understand to be an emergency route (our street tends to be among the streets that get plowed first when it snows).*
>
> *I called Pepco multiple times each day and never got the same answer (I was calling the emergency number for downed live wires, not the automated system). We and other neighbors called the fire department, and they directed us back to PEPCO. PEPCO sent crews out, and the workers would stand and look at the downed lines, shake their heads, say they couldn't help (didn't have the right equipment) and drive away.*
>
> *The wires came down on a Sunday afternoon. The LIVE wires STAYED where they were until Wednesday afternoon. Neighbors used cones, lawn chairs, and "caution tape" to close our street (at night you couldn't see the wires down). Four days. Kids were walking by.*
>
> *People were walking their dogs and riding bikes. All were trying to cross under the live wires on the opposite side of the street where they started to go up to a pole. We had LIVE wires in our driveway for four days. We could not use our car, had no electricity, and were stranded. I had to have a pharmacy deliver a prescription for my six year old. After the live wires were removed, I made an insurance claim to have my*

[113] Excerpts from Montgomery County survey comments.

car repaired; the burns and hole (from the I-bolt) did more than $8000 of damage to my car (not PEPCO's direct fault, but worth noting).

It took six days for somebody at Pepco to explain that having the meter reinstalled and the cables run up to the I-bolt was our responsibility (I'd been asking but never got the same answer twice; called electricians and got conflicting info from them, too, as I think, based on what I was told, DC and Mont Cty have different practices – but nobody knew which jurisdiction had which policy). We had an electrician do the work that day. On days six, seven, and eight, crews would come, again shake their heads, and say they STILL didn't have the necessary equipment to do the work.

On the night of the eighth day, I finally got a person on the end of the line who was almost as appalled as I that we were approaching our ninth day with no power. She actually transferred me to a dispatcher. That woman told me directly that she'd have a crew sent out THAT NIGHT to reconnect us. They came at 11:45pm. I went out to meet them. And they didn't have what they needed to do the work. They apologized and drove away.

The dispatcher had given me her name and told me to call back at 9am the following morning if we didn't have electricity by then. I did call her, actually got through to her, and she sent another crew. Our electricity was restored on DAY NINE by a SUBCONTRACTOR, not even a PEPCO crew. There was a PEPCO supervisor sitting in a small white pickup truck watching the subs do the work. When I approached him and asked how many people in Montgomery County were still without power, he looked at me and said, "You're last." I was dumbfounded.

B.2.4 COMPARISON OF DIFFERENCIAL RELIANCE ON CUSTOMER SERVICE REPRESENTATIVES DURING MAJOR EVENTS

Generally speaking, BGE's Major Storm Reports note that of the calls that it receives during storms, many are abandoned before being "answered" by either the customer service representative or the automated system(s). It maintains that this is because restoration time estimates were given to customers as part of the recorded message the customer received as soon as the phone connection was made, and that many customers hung up after hearing it. The percentage of calls handled by customer representatives for BGE in the figures that follow are therefore presented as a range, with the lower percentage including abandoned calls as part of the total and the upper range not including them. As can be seen, Pepco had fewer customer service personnel on hand the day the Hurricane occurred, and directed a higher percentage of customer calls to automated systems and a lower percentage to customer service representatives throughout the event, than did other area utilities.

Figure B11: Compiled Customer Call Center Data (from Major Storm Reports required to be filed with the PSC)

Utility	# of calls Day 1	Maximum # of Customer Service Reps. Day 1	% of calls presented to Automated System(s) Day 1	# of calls on peak call day	Maximum # of Customer Service Reps. on peak call day	% of calls presented to Automated System(s) on peak call day	Total # calls entire event	% of calls handled by Customer Service Reps. entire event
Allegheny	21,568	165	42.7%	64,951	211	56.3%	166,473	58.2%
BGE	115,673	105	56.1%	256,591	145	42.1%	712,380	46-66.5%
Delmarva	55,822	132	N/A	151,648	133	N/A	305,968	N/A
Pepco	50,948	55	86%	152,987	146	84.6%	464,762	40%

June 2008 storm

On June 3-4, 2008, high winds and thunderstorms caused many area utilities to lose power, including 188,000 Pepco customers, 126,652 of them in Montgomery County. Full service was not restored until June 8.

Figure B12 provides a comparison of the different reliance on customer service representatives that each utility used during this storm. As can be seen, Pepco had fewer customer service personnel on hand the day the storm occurred, and directed a higher percentage of customer calls to automated systems and a lower percentage to customer service representatives throughout the event, than did BGE.

Figure B12: Compiled Customer Call Center Data (from Major Storm Reports required to be filed with the PSC regarding the June 2008 Storm)

Utility	# of calls Day 1	Maximum # of Customer Service Reps. Day 1	% of calls presented to Automated System(s) Day 1	# of calls on peak call day	Maximum # of Customer Service Reps. on peak call day	% of calls presented to Automated System(s) on peak call day	Total # calls entire event	% of calls handled by Customer Service Reps. entire event
Allegheny	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BGE	51,044	89	61.2%	51,044	89	61.2%	89,075	58.9-72.7%
Pepco	77,172	48	69.1%	77,172	48	69.1%	169,506	40.3%

February 2010 Storms

Beginning on February 5, 2010, two blizzards dropped as much as three to four feet of snow on the region, which caused about 97,651 Pepco customers to experience outages, with 77,574 in Montgomery County[114].

Once again, and despite Pepco's post-Isabel assertion that it had addressed its communications challenges, FigureB.5 provides a comparison of the different reliance on customer service representatives that each utility used during this storm. As can be seen, Pepco directed a higher percentage of customer calls to automated systems and a lower percentage to customer service representatives throughout the event than did other area utilities.

Figure B13: Compiled Customer Call Center Data (from Major Storm Reports required to be filed with the PSC regarding the February 2010 Storms)

Utility	# of calls Day 1	Maximum # of Customer Service Reps. Day 1	% of calls presented to Automated System(s) Day 1	# of calls on peak call day	Maximum # of Customer Service Reps. on peak call day	% of calls presented to Automated System(s) on peak call day	Total # calls entire event	% of calls handled by Customer Service Reps. entire event
Allegheny	36,514	15	N/A	173,435	41	N/A	382,293	N/A
BGE	5,139	14	56.9%	85,245	98	38.1%	158,515	41-44.6%
Delmarva	2,266	22	61.7%	35,871	113	41.6%	114,357	44.6%
Pepco	10,255	23	91.2%	119,302	50	113,359	56,490	21.8%

July 25, 2010 Storm

On Sunday, July 25, 2010 a strong thunderstorm moved through the region, causing 323,662 outages for Pepco customers, 238,977 of them in Montgomery County. 90 percent of Pepco's customer outages were restored within 72 hours of the event with full restoration for Maryland customers occurring by 12:56 AM on July 31.

Figure B14 provides a comparison of the different reliance on customer service representatives that each utility used during this storm. As can be seen, Pepco had fewer customer service personnel on hand the day the storm occurred, and directed a higher percentage of customer calls to automated systems and a lower percentage to customer service representatives throughout the event, than did other area utilities.

[114] Hyslop, M. (February 17, 2010). Officials Say Pepco Did Fairly Well Considering the Conditions it Faced. *Gazette.* Retrieved from http://www.gazette.net/stories/02172010/montnew183709_32553.php and Pepco Major Storm Report February 5-12, 2010.

Figure B14: Compiled Customer Call Center Data (from Major Storm Reports required to be filed with the PSC regarding the July 25, 2010 Storm)

Utility	# of calls Day 1	Maximum # of Customer Service Reps. Day 1	% of calls presented to Automated System(s) Day 1	# of calls on peak call day	Maximum # of Customer Service Reps. on peak call day	% of calls presented to Automated System(s) on peak call day	Total # calls entire event	% of calls handled by Customer Service Reps. entire event
BGE	112,308	53	52.9%	112,308	53	52.9%	151,637	29.4 – 40%
Pepco	156,212	19	97.9%	156,212	19	97.9%	408,504	28.1%

Pepco's storm report also indicated numerous deficiencies related to its customer relations efforts. It is important to note that many of these deficiencies relate directly to problems Pepco committed to solve after the release of the Witt report:

- Automated estimates of restoration time provided to customers were grossly inaccurate, in some cases ranging to mid-September. Pepco's report claimed that this was because there were so many outages reported in such a short time, and there weren't many available restoration personnel visible to the automated system at the time, so its software basically made a math error.
- Customer service representatives couldn't access accurate estimates of the time it would take to restore service, which Pepco also attributed to the large numbers of simultaneously reported outages.
- Pepco called customers informing them their power had been restored when it had not.
- The outage maps and other web-based technology were overwhelmed by customer demand.

August 12, 2010 Storm

On August 12, 2010, a major thunderstorm caused 101,000 Pepco customers, including 77,445 in Montgomery County at peak. According to its September 7 Major Storm Report, which it was required to file with the PSC, about 90 percent of Pepco's customers were restored within 36 hours, with the remainder by 4 PM on August 15, 2010.

After the storm, the PSC held a public hearing at which Pepco officials stated[115] that they were satisfied with Pepco's response. "We know it's been a very frustrating summer for our customers," said David Velazquez, Pepco's executive vice president for power delivery. "It's been a very frustrating summer for us as well. We responded properly." Pepco officials suggested that customers' frustration stemmed from rising expectations. "The desire to have service restored quicker has increased," Velazquez said. If the company fell short, he said, it

[115] Stephens, J. and Davis, A. (August 18, 2010). Pepco defends post-storm efforts at hearing. *Washington Post.* Retrieved from http://www.washingtonpost.com/wp-dyn/content/article/2010/08/17/AR2010081705868.html.

was in not communicating adequately with its customers -- to let them know how long it would take to restore power and to educate them about the daunting challenges facing its crews."

Figure B15: Compiled Customer Call Center Data (from Major Storm Reports required to be filed with the PSC regarding the August 12, 2010 Storm)

Utility	# of calls Day 1	Maximum # of Customer Service Reps. Day 1	% of calls presented to Automated System(s) Day 1	# of calls on peak call day	Maximum # of Customer Service Reps. on peak call day	% of calls presented to Automated System(s) on peak call day	Total # calls entire event	% of calls handled by Customer Service Reps. entire event
Pepco	82,985	73	80.7%	82,985	73	80.7%	119,870	25.5%

Following the summer 2010 storms, the PSC opened an investigation, proceeding 9240, into Pepco's reliability. In responses to questions[116] from the PSC, Pepco made some notable statements and commitments:

- Pepco said that customers had a difficult time accessing Pepco's online outage maps because a higher number of customers than anticipated attempted to do so. Pepco again said it was fixing this problem.

- Customers received inaccurate Estimated Times of Restoration (ETR) due to a glitch in software that assumed incorrectly that no or very few crews would be available, and customer service representatives did not have access to ETR data.

- Pepco again committed to resolve these problems, and additionally, to ensure that outage maps and other information would be compatible with mobile devices by the end of 2010.

January 26, 2011 Storm

On Wednesday, January 26, 2011 the Washington D.C. metropolitan area was hit with a snow storm that dropped as much as nine inches of heavy wet snow, along with some ice and sleet in the area. About 210,000 Pepco customers lost power, with 136,695 of these in Montgomery County.

Although Baltimore Gas and Electric customers suffered more total outages than Pepco, it was able to close its storm response center around 10 PM on Saturday, January 29, after the vast majority of its outages were restored. By contrast, Pepco had to continually revise its predicted restoration times later and later as crews failed to meet initial milestones, and eventually restored power to 90 percent of its customers after 60 hours, which was longer than

[116] Questions 20-23, Response to Order No, 83552, Maryland Case 9240.

it took other area utilities. Some residents didn't get their power restored until the afternoon of January 31.

According to reports[117], Pepco's customer relations efforts and response were once again deficient as compared to other area utilities. "Bad information is no information," Steven Hubberman of Potomac said almost 72 hours after losing power. "It has been a very long time since we lost power and, as if it's not bad enough that it takes a long time to get it restored, they can't even give accurate information. You go to the Web site and you call, which is all you have, and what you hear is completely unreliable." Michael Weiner of Gaithersburg said he spent nights at his father's house, while his wife and 4-year-old daughter visited relatives in New Jersey. "Pepco's responsiveness to the situation has been abysmal," Weiner said. "You would think we were in Baghdad. But there are no insurgents bombing our power grid here."

What was also frustrating about Pepco's customer relations efforts was that its online outage map, which is supposed to contain information regarding where outages have been reported and expected restoration times, itself experienced an extended outage. Pepco's storm report, which was required to be filed with the PSC, stated that the reason for the outage was because of a mismatch between the time the website estimated restoration times and those obtained from customer service representatives, causing Pepco to take the outage map down.

Pepco's storm report also indicated that its Call Center voice mailbox was full at times during the storm, which left some customers both unable to speak to a customer service representative and unable to leave a message.

Residents also complained[118] that Pepco's website did not operate optimally on hand-held devices or iPads, despite Pepco's commitment to the PSC that this technological upgrade would have been completed by the end of 2010.

Figure B8 provides a comparison of the different reliance on customer service representatives that each utility used during this storm. As can be seen, Pepco had fewer customer service personnel on hand the day the storm occurred, and directed a higher percentage of customer calls to automated systems and a lower percentage to customer service representatives throughout the event, than did BGE.

[117] Flaherty, M, P. (January 28, 2011). Pepco, Dominion Virginia Power, BGE Work to Turn Lights Back on After Snowstorm. *Washington Post*. Retrieved from http://www.washingtonpost.com/local/pepco-dominion-virginia-power-bge-work-to-turn-lights-back-on-after-snowstorm/2011/01/28/ABRed5Q_story.html. Thomas-Lester, A. (January 29, 2011). For Pepco, Customer Wrath Extends the Storm. *Washington Post*. Retrieved from http://www.washingtonpost.com/business/for-pepco-customer-wrath-extends-the-storm/2011/01/29/ABK2s5Q_story.html. Stephens, J. (January 31, 2011). Pepco Struggles to End Power Outages. *Washington Post*. Retrieved from http://www.washingtonpost.com/wpdyn/content/article/2011/01/30/AR2011013004134.html.

[118] WTOP, January 26, 2011.

Figure B16: Compiled Customer Call Center Data (from Major Storm Reports required to be filed with the PSC regarding the January 26, 2011 Storm)

Utility	# of calls Day 1	Maximum # of Customer Service Reps. Day 1	% of calls presented to Automated System(s) Day 1	# of calls on peak call day	Maximum # of Customer Service Reps. on peak call day	% of calls presented to Automated System(s) on peak call day	Total # calls entire event	% of calls handled by Customer Service Reps. entire event
BGE	92,703	104	61.9%	157,164	185	55.8%	289,417	39-54.7%
Pepco	71,034	41	94.7%	116,318	204	77.6%	276,116	30.4%

Conclusion

If Pepco is ever to regain the trust of its Montgomery County customers, it must begin to "treat its customers like they are customers," to paraphrase one of the residents who presented to the Work Group on January 5, 2011. As an overarching recommendation, Pepco must provide complete and accurate information to customers via all means of communication, including communication with the media.

APPENDIX C – Additional Economic Findings

C.1 PURPOSE

Like any business, a utility responds to financial incentives -- positive and negative. Whether and how a utility spends money on outage prevention and mitigation depends in part on the financial rewards and penalties it expects to receive from its performance. In utility regulation, those expectations depend in large part on signals sent by legislation and Public Service Commission actions. This Appendix addresses the need for clarity in those signals. We address three related areas:

A Economic value of outage prevention and mitigation;

B. Utility compensation under Commission rules; and,

C. Commission preparedness to make judgments about outage performance.

C.2 ADDITIONAL FINDINGS

OUTAGE RESPONSIBILITY

1. When asked "What guidance has Pepco received from the PSC concerning expectations for outage performance?", the company responded only by quoting the statute: "Section 5-303 of the Public Utilities Article, Annotated Code of Maryland, provides as follows with respect to standards of service: 'A public service company shall furnish equipment, services, and facilities that are safe, adequate, just, reasonable, economical, and efficient, considering the conservation of natural resources and the quality of the environment[119].'"
2. Not all outage costs are someone's fault. There can be at least five causes, individually or in combination:
    i. utility imprudence
    ii. Commission error (e.g., denying legitimate utility requests for cost recovery associated with outage prevention or mitigation, thereby leaving the utility unable to do its job)
    iii. local government error (e.g., failure to plow streets can extend outages)
    iv. errors by the customers, their neighbors or landlords, such as in failing to notify the utility or county of tree interference
    v. natural forces

[119] MC Data Request 3, Q2G.

3. Holding the utility accountable for outages, should be on the utility's imprudence only.
4. The utility cannot avoid accountability through blame-shifting. A utility seeking to defend against penalties for outages on the grounds that the outages would have been avoidable, or mitigated, had local governments or customers taken certain actions, must demonstrate that the utility prudently sought to educate the local governments and customers about the need for those actions.
5. The District of Columbia Public Service Commission has recognized that decoupling, unadjusted, shields the utility from economic consequences of outages, including outages caused by imprudence. The BSA established by that Commission therefore has a major storm outage adjustment in which the revenues recovered are reduced by the value of the estimated outage kWh. The Maryland Commission is now considering such an adjustment for Pepco in Case Nos. 9257 – 9260. The Maryland Commission should make that adjustment promptly, particularly since its original approval of the BSA in 2007 was based on an incorrect premise – that the company was providing reliable service to its customers – a premise proven wrong by the company's outage performance since then. The Commission should also recognize that adjusting the BSA, by itself, only prevents the Company from being financially indifferent to outages; it does not substitute for a full set of standards and penalties that will induce the Company to align its self interest with the public interest and improve its performance.
6. The Work Group also asked for Pepco's assessment of Maryland's present approach to compensation-related to outage performance. The company avoided the question, saying: "Until the Commission takes final action [in Docket No. RM-43], the Company cannot make a final assessment." We did not ask about the proposed rule, we asked about current practice.

Penalty Systems Examined

1. The absence of company liability for negligently harming its customers is all the more reason to ensure that penalties induce the utility performance that will avoid these types of losses. The penalty proceeds can be used to grant customers refunds, perhaps in proportion to their usage or to the duration of the outages they experienced. These refunds would recognize that customer losses occur but would not purport to make customers whole.

    a. end up owning the telephone company . . . [or] phone rates would have to be increased astronomically to recoup such liability payments."[5]

    See also Strauss v. Belle Realty Co., 482 N.E.2d 34, 36 (N.Y. 1985) (observing that "the liability of utilities for consequential damages for failure to provide service . . . [can] be enormous"); *Abraham v. New York Telephone Co.*, 380 N.Y.S.2d 969, 972 (N.Y. Sup. Ct. 1976) (if not properly limited, liability can have "a catastrophic impact on the rates to be charged the public at large"); *Bulbman, Inc. v. Nevada Bell*, 825 P.2d 588, 590 (Nev. 1992) ("absent liability limitations such as that contained in [the tariff], the broad liability exposure faced by utilities would create tremendous upward pressure on utility service

rates); *Waters v. Pacific Telephone Co.*, 523 P.2d 1161, 1164 (Cal. 1974). *Landrum v. Florida Power & Light Co.*, 505 So.2d 552, 554 (Fla.Ct.App. 1987) ("[A] limitation of liability contained in a tariff is an essential part of the rate" and thus "[a] broadened liability exposure must inevitably raise the cost and thereby the rates, of electric service.").

b. Prosser and Keeton observed that "[T]he imposition of tort liability on those who must render continuous service . . . to all who apply for it under all kinds of circumstances could be ruinous and the expense of litigating and settling claims over the issue of whether or not there was negligence could be a greater burden to the rate payer than can be socially justified."

Prosser and Keaton, *Torts*, sec. 93, at 671 (5th Ed. 1984).

2. If the utility cut costs imprudently to add profit, and the cost-cutting contributed to an outage, the penalty should at least eliminate the incremental profit. If the penalty is, say, $40,000 but the expenditure necessary to avoid imprudence would have been $500,000, the system will not work because any rational business would prefer to pay the $40,000 penalty rather than incur the $500,000 expenses. This approach would leave the company with the perverse incentive to cut costs imprudently.
3. The purpose of a penalty is to make the non-compliant utility worse off, so it has an economic incentive to comply. Giving the penalty proceeds right back to the non-compliant utility makes no sense.
4. The limits of the penalty solution: There is the possibility that a penalty could be so large as to leave the company unable to provide reliable service, or able to provide that service only by incurring unusually high finance costs (due to the financial community's negative reaction to the penalty). This is a too big to fail situation, where our dependence on a single utility leaves us unable to hold that utility accountable sufficiently. While the Commission's discretion over penalties should take the company's survival into account, if the Commission detects a pattern of deficient outage performance that puts ratepayers in a position of having to protect a company from its own imprudence, the Commission should initiate lawful procedures to find a replacement for the utility. See Appendix E for a summary of Pepco's franchise to operate in Montgomery County. No utility has a right to occupy its monopoly status indefinitely, without regard for performance.
5. Employee compensation: It is unclear how Pepco's top executives ensure that excellence pervades the organization. The possibility of Commission-imposed penalties on shareholders for company error is a start. But shareholder penalties alone do not necessarily improve management and employee performance. The connection between performance and pay must permeate the organization. It is common for executive compensation to be based on profit; is Pepco's compensation also based on outage performance? Given the company's history of budgeting insufficiently for outages, and then shifting some outage-related funds to other activities[120], clarity is necessary on how compensation works.

[120] First Quartile and Silverpoint Report to the PSC, Page 47.

Commission Preparedness

To obtain an understanding of the Commission's resources, relative to the many demands placed on it, the Working Group submitted to the Commission, informally, a set of detailed questions below. The purpose of these questions is not to critique the Commission's readiness or actions but to obtain the Commission's thoughts about its needs. The Commission chose not to answer the questions, communicating this decision to the Working Group informally. We hope that the Commission, and the Legislature, can work together to gather the necessary answers to these questions and then make resource decisions. The entire correspondence to the PSC:

Introduction

The Work Group wishes to ensure that the Commission has sufficient resources, in terms of staff quantity, skill set and experience, so that the Commission can (1) regularly evaluate the utilities' outage preparedness and performance, and (2) take all actions necessary to improve that performance. Our goal is not to critique the Commission's readiness or actions; it is to obtain the Commission's thoughts about its needs. We will take those thoughts into account as we craft our recommendations to the County Executive concerning policies and practices affecting utility outages.

We recognize that the Commission has instituted a number of inquiries and proceedings on utility outage performance. We appreciate the magnitude of this workload, undertaken in addition to its "normal" responsibilities, all under fiscal constraints that are not of the Commission's making. We hope the dialogue initiated by these questions will assist the Commission in its efforts.

This part of our inquiry is supported by two main premises:

> A utility's performance is influenced by (1) the Commission's expectations, and (2) the manner in which the Commission holds the utility accountable for meeting those expectations, including how the Commission determines the utility's compensation.
>
> To ensure the utility's accountability for meeting the Commission's expectations, Commission oversight, in one or more forms, is necessary at all stages of utility activity: planning the necessary expenditures (both capital and expense), making the necessary expenditures, preparing for and responding to outages, and conducting post-outage critique and corrections.

Questions

1. Does the Commission have any comments about the two premises stated above?

2. What are the technical skills, expertise and knowledge bases that the Commission expects to see in the utility employees responsible for the various aspects of outage performance? Please take into account all professional disciplines, including but not limited to engineering, management, economics, accounting, and finance.

3. What are the technical skills and knowledge bases necessary currently within the Commission for assessing utility performance in each of the above-listed areas? Please distinguish (a) staff expertise continuously necessary to identify investments and practices necessary for utility preparedness and improvement, from (b) staff expertise necessary to investigate and evaluate the utility's handling of specific outage events. Please take into account all professional disciplines, including but not limited to engineering, management, economics, accounting, and finance.

4. Without, if possible, providing information that would reveal the identities of specific staff, please describe the education, training, skills and experience of those individual Commission staff that are currently responsible for evaluating the utilities' outage performance.

5. The Commission recently hired consultants to prepare recommendations on utilities' outage performance. What technical skills, expertise and knowledge bases did the Commission wish to see in its consultants?

6. The Work Group understands that is common for government agencies to retain consultants with specialized skills for episodic assignments where it would not be cost-effective to maintain such skills on staff continuously. What are the differences between (a) the skills deemed necessary for the current consulting assignment, and (b) the skills you deem necessary to have on staff continuously?

7. What limitations (financial, procedural, other) does the Commission face in retaining consultants of the quality and expertise retained for the present outage investigation?

8. What limitations (financial, procedural, other) does the Commission face in hiring internal staff with the expertise necessary to evaluate utility outage performance? Please take into account budget constraints, state hiring rules, labor market characteristics, and any other relevant factors.

9. On a percentage basis (so as to avoid revealing specific individuals' salaries), roughly speaking, what are the salary differentials between (a) the state employees responsible for evaluating the utilities' outage performance, and (b) the utility employees who carry out outage-related duties? There are likely different answers for different types of skills.

10. Concerning the Commission's current staff, what are their outage-related activities (a) during the majority of the year when there are not specific outage problems or outage-related proceedings and (b) during those periods when there are specific outage problems or outage-related proceedings?

11. Are you aware of other state commissions that, in your opinion, have the optimal staffing to address outage issues? If so, please identify them and describe their staffing.

12. Assume the Legislature made available resources for additional outage-related employees. What types of employees would the Commission hire if it could hire 3, 5 and 10 new employees for this space?

13. Please provide any other information or thoughts that will help the Work Group form opinions and recommendations on how to ensure that the Commission is sufficiently staffed to set standards for outage performance and to hold the utilities accountable for that performance.

APPENDIX D – Montgomery County Government Information Sharing Requirements

D.1 PURPOSE

The purpose of Appendix D is to assist Pepco as it improves current information sharing policies and programs and makes choices about future decisions on information sharing technology and training. As stated in Chapter 6. Government Interface, both government and Pepco have the mutual objective of mitigating power outage events and decreasing their impact on the people who live, work and visit the county. To assist Pepco and County Government in achieving this objective, the Work Group worked with Montgomery County Public Safety Officials to develop this Appendix focusing on reporting requirements during normal operating conditions and for Major Events.

D.2 MONTGOMERY COUNTY REPORTING NEEDS

D.2.1 REPORTING REQUIREMENTS-NORMAL CONDITIONS

Pepco has evaluated technology for a notification system and has plans to deploy this capability for individual customers as part of the functionality and customer benefits of the Advanced Metering Infrastructure (AMI) in Maryland[121]. While this capability would be available to individual customers, Pepco should expand the system to send information to government officials to improve county and municipality decision making. Specifically, the Work Group along with Montgomery County Government has developed the following information sharing requirements.

Information Sharing Requirements:

1. Provide notification within 30 minutes to the County and municipalities regarding significant outages including:
    i. Substation failure resulting in outages to over 1,000 customers;
    ii. Feeder(s) being locked out resulting in outages to over 1,000 customers;
    iii. Outages resulting in an estimated repair time of greater than 24-hours to 10 or more customers;
    iv. Outages resulting in an estimated repair time of greater than 24-hours to a customer with a weight greater than one on the Pepco Weighted Customer Counts scale;
    v. Outages to a Tier 1 or Tier 2 critical facility as defined in Figure D1 – Critical Facilities by Tier; and

[121] MC Data request 2, Q24.

vi. Pepco infrastructure damage requiring the closure of a County or State maintained roadway or that impacts Metro rail service.

2. Provide notification in advance of planned outages or repairs including:

   i. Substation disruption resulting in outages to more than 1,000 customers;

   ii. Feeder(s) being locked out resulting in outages to more than 1,000 customers;

   iii. Outages resulting in an estimated repair time of greater than 24-hours to 10 or more customers;

   iv. Any outages resulting in interrupted power supply to a Tier 1 or Tier 2 critical facilities as defined in FigureD1;

   v. Any outages of greater than 8 hours resulting in interrupted power supply to a Tier 3 critical facility as defined in Figure D1; and

   vi. Closure of a County or State maintained roadway or partial closures involving 2 or more lanes of a State or County maintained roadway.

Figure D1 – Critical Facilities by Tier

Tier 1 Facility	Tier 2 Facility	Tier 3 Facility
1) Water Treatment Plant 2) Hospital 3) 911 Center (and Alternate) 4) Emergency Operations Center (and Alternate) 5) Active Emergency Shelter (as appropriate)	1) Fire Station 2) Police Station 3) Nursing Home 4) Correctional Facility 5) Large Assisted Living (As defined by county regulations)	1) Small Assisted Living 2) Private Healthcare Facilities 3) Apartment Building (>200 apartments) 4) County-run Shelter (women's and men's)

D.2.2 REPORTING REQUIREMENTS – MAJOR EVENT OUTAGES

During Major Event outages, government resources become limited, thereby shifting planning and response efforts to address county outages as a whole rather than on an individual basis. Their decisions often result in the opening of shelters and the movement of limited resources to areas of the county with the greatest impact. Time is a significant factor on county decision making. Put simply, the longer the outage the greater the potential hazards associated with that outage. As a result, it is recommended Pepco report not just outages at a particular point in time, but also as a measure of time.

i. Total outages;

ii. Outages greater than six hours;

iii. Outages greater than 24 hours;

iv. Outages greater than 48 hours;

v. Outages greater than 72 hours; and

vi. Outages greater than 96 hours.

In addition, reporting requirements also need to be accompanied with broader measures of power restoration progress and put into a form that can provide a quick assessment of the current conditions. This quick snap-shot is often best produced in graphical form through Geographic Information System (GIS) maps, but for many without GIS capability at their fingertips, we recommend it also be provided in table form. To support the reporting efforts from Pepco to the county during major event outages, the county has provided to the Work Group Figure D2. The Figure contains categories broader than just Tier 1, 2 and 3 facilities necessary for decision making including:

i. Substations without power;

ii. Feeders locker out;

iii. Transformers without power;

iv. Active Outages;

v. Montgomery County Government Buildings;

vi. Schools;

vii. Outages by Police District; and

viii. Outages by Fire District.

The Work Group recommends Pepco 1) complete the table below within six hours after a major outage event has occurred and every sixth hour thereafter, and 2) Provide accompanying GIS data identifying both transformer outages and Tier 1 and 2 facility outages. The Work Group also recommends the county provide to Pepco annually a complete list of Facilities outlined in Tier 1, 2, 3 and Schools and Montgomery County Government Buildings identified in the reporting category.

1. Provide real-time GIS information including:

    i. Access to real-time GIS data at a minimum of six hour intervals or within two hours of being requested;

    ii. Access to contact names 24/7, email addresses and phone numbers to forward GIS data/Shape files providing priority locations of Pepco outages. In return, DOT and local municipalities' staff would support and provide access to priority locations (Substations, Main Distribution, Feeder, etc.); and

    iii. Status data on Pepco, DOT and local municipalities updated and forwarded as priorities change.

2. MC Public Safety Officials wish to note the following:

iv. All data will remain confidential and used only within the DOT and local municipalities as necessary to maintain necessary level of response resources.

Division of Highway Service of Montgomery County Department of Transportation (MCDOT) wishes to initiate a project in partnership with Pepco to develop a system through which GIS based data can be shared between MCDOT and Pepco in a manner that is more expeditious yet rich in content and functionality. MCDOT is of the opinion that such IT imitative is essential to assist Pepco during storm events with heavy snowfall that often generates extensive power outage throughout Montgomery County. Upon the completion of the proposed joint venture, Pepco will be able to access trouble sites without heavy snow impeding the restoration operation as it often sites the main reason to delayed restoration of power to Montgomery County residents.

D.2.3 EMG TRAINING FOR PEPCO LIAISON TO MONTGOMERY COUNTY

Pepco EOC liaisons to Montgomery County should:

1. Attend all mandatory EOC training classes. (Currently the only mandatory training classes are ICS 100 and 200, which can be taken online at any time, and WebEOC, which is offered at least six times annually.)

2. Attend at a minimum one Montgomery County exercise annually.

3. Participate in at least half of the on-line WebEOC drills (each averages 15 minutes and can be taken anytime during the day by computer).

4. Provide a qualified representative with decision making authority to revise the order of power restoration as directed by the Montgomery County Disaster Manager.

This should be done well prior to (warnings for) Major Events.

Figure D2 – Sample Pepco Outage Report

	Facility Type	Total Number	Total Without power	> 6 hours	> 24 hours	> 48 hours	> 72 hours	> 96 hours	>120 hours
	Customers								
	Substations								
	Feeders								
	Transformers								
	Active Outages								
Tier 1	Water Treatment Facility	**2**							
	Hospitals	**5**							
	911 Center, EOC, Backup 911 Center	**3**							
	Active Emergency Shelters	**TBD**							
Tier 2	Public Safety (Fire, Police, Corrections)	**47**							
	Nursing Homes	**34**							
	Assisted Living Large	**26**							
Tier 3	Private medical facilities (Dialysis, etc)								
	High rise large (> 200 apartments)								
	Assisted Living Small								
	County Run Shelters								

Figure D2 – Sample Pepco Outage Report (Continued)

	Facility Type	Total Number	Total Without power	> 6 hours	> 24 hours	> 48 hours	> 72 hours	> 96 hours	>120 hours
Reporting	Montgomery County Government Building								
	Montgomery County Schools								
	Police District 1								
	Police District 2								
	Police District 3								
	Police District 4								
	Police District 5								
	Police District 6								
	Fire District 1								
	Fire District 2								
	Fire District 3								
	Fire District 4								
	Fire District 5								
	Fire District 6								
	Fire District 7								
	Fire District 8								
	Fire District 9								
	Fire District 10								
	Fire District 11								
	Fire District 12								
	Fire District 13								
	Fire District 14								
	Fire District 15								
	Fire District 16								

Figure D2 – Sample Pepco Outage Report (Continued)

	Facility Type	Total Number	Total Without power	> 6 hours	> 24 hours	> 48 hours	> 72 hours	> 96 hours	>120 hours
Reporting (continued)	Fire District 17								
	Fire District 18								
	Fire District 19								
	Fire District 20								
	Fire District 21								
	Fire District 22								
	Fire District 23								
	Fire District 24								
	Fire District 25								
	Fire District 26								
	Fire District 27								
	Fire District 28								
	Fire District 29								
	Fire District 30								
	Fire District 31								
	Fire District 32								
	Fire District 33								

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APPENDIX E – Pepco Franchise

SUMMARY OF PEPCO'S FRANCHISE
TO OPERATE IN MONTGOMERY COUNTY, MARYLAND

The Montgomery County Executive's Pepco Work Group has been tasked with making recommendations about the underlying reasons for Pepco's poor service reliability. As part of their investigation, staff was asked to locate the franchise for Pepco to operate in Montgomery County and the Work Group also requested information from Pepco regarding it's authority to provide service in Montgomery County[122]. Pepco responded:

> *Please refer to Potomac Electric Power Company v. Birkett, 217 Md. 476, 143 A.2d 485 (1958), for a discussion of Pepco's franchise authority as exercised in Montgomery County, including the authority granted by the General Assembly of Maryland pursuant to Chapter 540 of the Acts of 1894 as amended by Chapter 245 of the Acts of 1900.*

According to Maryland law a public service company may not exercise a franchise granted by law except to the extent authorized by the Commission[123]. A state-wide franchise was granted to Pepco's predecessor, Great Falls Power Company, by Chapter 540 of the Laws of Maryland, 1894, as amended by Chapter 245 of the Laws of Maryland, 1900. (Attachment 1). The franchise granted authority for Great Falls Power Company to "lay, construct and build lines or conductors under, along, upon or over the streets, squares, lanes, alleys, roads and ways, paved or unpaved, of any of the counties of this state"[124].

On June 11, 1952, Pepco filed an application with the Montgomery County Council for a "non-exclusive, twenty five year franchise (commencing August 9, 1952) to erect poles, string lighting, power and guy wires, erect guy stubs, and install other attachments and appliances, to maintain and operate the same, and to do any and all other things necessary or proper in connection with the sale and supply of electricity for light, heat and power, or any of them, to consumers, over, along and adjacent to any and all of the public highways, streets, roads and alleys within Montgomery County, Maryland; such a franchise to be in renewal of the undersigned's existing franchise granted by said Order passed August 9, 1927"[125].

Pepco filed a petition with the Maryland Public Service Commission on October 14, 1952 "In the Matter of the Application of POTOMAC ELECTRIC POWER COMPANY For an Order, permitting and approving its exercise, in Montgomery County, of the franchise acquired by it from Great Falls Power Company"[126]. In 1947 Great Falls Power Company transferred all of its assets to Washington Railway and Electric Company which then transferred all of its assets to

[122] MC Data Request 3, Q 3E.
[123] See Public Utilities Article, *Annotated Code of Maryland*, §5-201 – Franchises.
[124] 1900 Md. Laws, Ch. 245.
[125] PSC Case No. 5263, Pepco Exhibit No. 4 – Ordinance Granting Franchise to Potomac Electric Power Company.
[126] PSC Case No. 5263.

Pepco. Pepco argued that it did not need the consent of Montgomery County to exercise the franchise acquired by it from Great Falls Power Company.

According to the letter to the PSC from David Macdonald, County Attorney dated October 17, 1952, "As you probably know, PEPCO filed an application with the County several months ago for a franchise to use the streets and roads of the County for the installation and maintenance of its transmission lines. The County Council adopted an ordinance on September 16, 1952 granting PEPCO a franchise to use the streets but PEPCO earlier this week refused to accept the ordinance as adopted."

Pepco indicated to the County Council that subsequent to their making the application they "became aware of our possession of a perpetual franchise to operate in Montgomery County which had originally been granted by the Maryland legislature to Great Falls Power Company, one of our predecessors"[127].

This franchise was authorized to be exercised by Pepco in Montgomery County by the Public Service Commission in PSC Case No. 5263 Order 50070 dated May 15, 1953 (Attachment 2). "On May 15, 1953, after a full hearing in which Pepco asserted its rights and Montgomery County vigorously denied them, the Public Service Commission, deciding the very issues raised in this case, found that although the franchise of Great Falls had never been exercised by Pepco, its exercise might be useful in the rendition of public service in Montgomery County, ordered that Pepco be authorized to 'exercise such franchise as it may have acquired from Great Falls Power Company directly or indirectly from some intermediary corporation….' An appeal from this order by Montgomery County to the Circuit Court for that County was dismissed with prejudice"[128].

The PSC later instituted an investigation into the service areas of electric utilities at the request of the People's Counsel who "suggested that each of the utilities prepare maps for the Commission which would show the area which the particular utility considered to be its service area and to submit a written statement to support its claim to the territory in the State of Maryland within which the utility considered that it could construct extensions of its facilities, including generation, transmission and distribution facilities, without any further specific authorization from the Commission or any political subdivision of the state"[129]. Pepco cited the "[s]tate-wide franchise granted to our predecessor, Great Falls Power Company, by Chapter 540 of the Laws of Maryland, 1894, as amended by Chapter 245 of the Laws of Maryland, 1900 – authorized to be exercised by us in Montgomery County by Commission Order No. 50070 dated May 15, 1953 (Case No. 5263)"[130].

In PSC Case No. 6017 the PSC established the boundaries of the service territories for electric utilities in Maryland, and requests for modifications to the service areas have been addressed in subsequent related cases. "On April 27, 1966, the Commission designated the service areas of electric utilities in the State of Maryland with certain minor exceptions. *In the Matter of the*

[127] *Id*. Pepco Exhibit No. 5.
[128] *Potomac Electric Power Company v. Birkett* (217 Md. 476, 488).
[129] PSC Case No. 6017, Order 56203.
[130] PSC Case No. 6017 – Letter from Potomac Electric Power Company to PSC dated August 26, 1964.

Establishment of Service Areas of Electric Utilities Within the State of Maryland, Case No. 6017, Order No. 56203. Case No. 6017 and Case No. 8000 are the direct predecessors of current Case No. 8800."[131]

The PSC cites two Maryland court cases in its February 10, 2011 "Notice Expanding Scope of Issues" in Case No. 9240, regarding the scope of the PSC's authority for "modification of the Company's service territory or revocation of the Company's authority to exercise its franchise(s)" pursuant to the Public Utilities Article, *Annotated Code of Maryland§* Sec. 5-201. In *Highfield Water Company*, the court (quoting *Worcester Elec. Co. v. Hancock)* makes a distinction between revoking a utility's authority to exercise its franchise and revoking the franchise itself: "The powers conferred upon the commission are of a regulatory nature. They do not include either the granting or withdrawal of franchises, although the exercise of rights under franchises duly acquired by private corporations and of powers acquired by municipalities under legislative grants may be permitted or prohibited by the commission…." (*Highfield Water Co. v. PSC*, 46 Md. App. 332, 346 (1980), See also *Mayor of Berlin v. Delmarva Power & Light Co.*, 95 Md. App. 585 (1993).

[131] PSC Case No. 8800, Order 76843, Footnote 2.

ATTACHMENT E1

Source: Maryland State Archives

now a resident of the new third election precinct or of the new first election precinct, as the case may be; and the Board of Supervisors of Elections, shall cause for each of said new precincts a duplicate registry to be prepared by having accurately copied therein the names of all the voters not stricken off, together with all the entries on such registry relating to each one of said voters whose names are not stricken off, and they shall label said copies, "Duplicate registry of the first election precinct of the fourteenth election district of Baltimore County," and "Duplicate registry of the third election precinct of the fourteenth election district of Baltimore County," respectively, and the said Board of Supervisors of Elections shall certify in each of said duplicate registers that said duplicate is an exact copy of all the names and all the entries unerased upon the original from which duplicate was copied, and the said original registry so labeled "original registry of the first election precinct of the fourteenth election district of Baltimore County," and its copy shall hereafter constitute the duplicate registries of the first election precinct of the fourteenth election district of Baltimore County, and the said original registry labeled original registry of the third election precinct of the fourteenth election district of Baltimore County, and its copy shall thereafter constitute the duplicate registries of the said third election precinct of the said fourteenth election district of Baltimore County.

SEC. 3. *And be it enacted*, That this Act shall take effect from the date of its passage.

Approved April 5, 1900.

CHAPTER 245.

Great Falls Power Co.

AN ACT to repeal and re-enact, with amendments, Sections one and three of Chapter five hundred and forty of the Acts of the General Assembly of Maryland, eighteen hundred and ninety-four, being an Act to authorize the Great Falls Power Company to erect dams, hold real estate, and to erect and maintain lines for the transmission of electricity in Montgomery and Prince George's Counties, in the State of Maryland, and to add an additional section thereto, to be called Section 3A, and to grant certain additional powers, rights and privileges unto the said Great Falls Power Company.

SECTION 1. *Be it enacted by the General Assembly of Maryland*, That Sections 1 and 3 of Chapter five hundred and forty of the General Assembly of Maryland, passed at its January Session, eighteen hundred and ninety-four, be and the same are hereby repealed and re-enacted to read as follows:

Right to erect dam, condemn property, etc.

1. The Great Falls Power Company aforesaid is hereby granted the right to erect such dam or dams or other structures in the Potomac river, in this State, as may be necessary to accomplish the purposes and objects set forth in its original and amended charters, and to that end to condemn property, whether held by individuals or corporations in the State of Maryland in the same full and ample manner as is provided by the section of Article 23 of the Code of Public General Laws of Maryland, title "Corporations," sub-title "Railroad Corporations," and subject to the restrictions and limitations therein contained, so far as the same are applicable to the changed purposes, objects and designs of the Great Falls Power Company, as established by the provisions of its charter and any amendments thereto; provided, however, that said company shall have the same full, ample and like

Powers defined.

powers for acquiring by agreement, purchase, gift or condemnation property for its uses and purposes as a railroad company would have under the provisions of the aforegoing Article 23 of the Code of Public General Laws of Maryland, and any amendments thereto; provided, however, that the acceptance of this Act shall oblige and bind the said Great Falls Power Company not to take, occupy, use, interfere with or damage any property or right vested in the Chesapeake and Ohio Canal Company acquired as the successor of the Potomac Company or otherwise, and not to endanger any part of the canal or works of said canal company in any degree by liability to flood, except by or under written agreement or agreements between the said power company on the one part and the said canal company and the trustees for the time being of the bondholders of said canal company under its mortgages of 1848 and 1878 on the other part, and approved by the Board of Public Works; and as conditioned precedent to the exercise of the right herein granted to build a dam or other structure, as aforesaid, the said power company shall file with the Board of Public Works a survey and plan of the same, showing its location, elevation and construction as proposed, and provided also that nothing herein contained shall be so construed as to authorize and empower the Great Falls Power Company to interfere with the vested property-rights of the Montgomery Power Company.

Sec. 3. Said corporation is hereby authorized and empowered to lay, construct and build lines or conductors under, along, upon or over the streets, squares, lanes, alleys, roads and ways, paved or unpaved, of any of the counties of this State, and to connect the same with any manufactory, public or private buildings, lamps or other structures or objects, and with the place of supply, and also with any line or lines authorized to be erected in the District of Columbia or in the State of Virginia, subject, however, to any laws or ordinances that may be passed by the municipal authorities of the cities, towns or counties having jurisdiction over said streets, squares, lanes, alleys, roads and ways, for the filling up, repairing or restoring such streets, squares, lanes, alleys, roads and ways to their normal condition.

Authority to construct and build, etc.

Sec. 3A. *And be it further enacted*, That said corporation is hereby authorized and empowered by a vote of the majority, in interest of its capital stock actually issued and outstanding at such time or times, to contract with any domestic or foreign corporation or corporations for a consideration, merger, lease, purchase or sale, and to do all matters and acts, deeds and things which shall be necessary or expedient to accomplish such object, and when so accomplished, all of the assets, rights, franchises and properties of every kind and description whatsoever shall be and become the assets, rights, franchises and properties of the company so resulting from said consolidation, lease, merger or otherwise, as fully and to all intents and purposes as if the powers herein conferred had been expressly granted to such consolidated or merged company; and the power to consolidate, merge, lease, purchase, sell or otherwise contract with the said company is hereby expressly given to any domestic or foreign corporation or corporations incorporated for purposes not inconsistent with the objects of the Great Falls Power Company.

Authorized to consolidate with other corporations, etc.

SEC. 2. *And be it further enacted*, That this Act shall take effect from the date of its passage.

Approved April 7, 1900.

CHAPTER 246.

AN ACT to repeal and re-enact with amendments Sections two and three of Chapter five hundred and ten of the Acts of eighteen hundred and ninety-eight, entitled "An Act to Incorporate the Continental Trust Company."

ATTACHMENT E2

> up, repairing or restoring such streets, squares, lanes, allays, roads and ways to their normal condition."

and that Chapter 540 of the Acts of 1894, as amended by Chapter 245 of the Acts of 1900, also expressly provides as follows:

> "That said (Great Falls Power Company) * * * is hereby authorized and empowered * * * to contract with any domestic or foreign corporation or corporations for a consideration (sic), merger, lease, purchase or sale, and to do all matters and acts, deeds and things which shall be necessary or expedient to accomplish such object, and when so accomplished, all of the assets, rights, franchises and properties of every kind and description whatsoever shall be and become the assets, rights, franchises and properties of the company so resulting from said consolidation, lease, merger or otherwise, as fully and to all intents and purposes as if the powers herein conferred had been expressly granted to such consolidated or merged company; and the power to consolidate, merge, lease, purchase, sell or otherwise contract with the said company is hereby expressly given to any domestic or foreign corporation or corporations incorporated for purposes not inconsistent with the objects of the Great Falls Power Company."

By a deed dated August 14, 1947, a copy of which is filed in this proceeding as "Pepco Exhibit No. 13B" and by an instrument dated also August 14, 1947, a copy of which is filed in this proceeding as "Pepco Exhibit No. 13C," Great Falls Power Company transferred to Washington Railway and Electric all of its assets of every nature and description and wheresoever located, including all water rights, privileges and powers vested in Great Falls Company, and by instruments dated September 30, 1947 and December 31, 1947, filed in this proceeding as "Pepco Exhibit No. 13G" and "Pepco Exhibit No. 13H," respectively, Washington Railway and Electric Company transferred to Potomac Electric Power Company all of its assets.

Such franchise as Potomac Electric Power Company may have acquired from Great Falls Power Company was acquired by it through Washington Railway and Electric Company, a corporation organized in 1892 by special Act of Congress, which Company was dissolved and liquidated in 1947. In the petition it is stated that as a part of such dissolution and liquidation Washington Railway and Electric Company conveyed, transferred and assigned to Potomac Electric Power Company certain of its property and assets, including all of the assets acquired by it from Great Falls Power Company.

Montgomery County, Maryland, intervened in the proceeding before the Commission and participated in the hearing on the application in this case which was held, after due notice, on December 10, 1952. Briefs were filed by the petitioner and by the intervener. Counsel for Montgomery County, in his brief, submitted the following conclusion:

> "Pepco has not obtained an exercisable franchise from Great Falls because 1. the transfer of the rights of Great Falls to Washington Railway Electric and then to Pepco in 1947 was void and of no effect, and 2. Great Falls had abandoned its rights by 1947 and they cannot now be raised from oblivion to defeat the right of Montgomery County to require its consent to the exercise of franchises. Even if Pepco had an exercisable franchise, the state of the law is that the consent of Montgomery County must be obtained before its exercise. Accordingly, the application of Potomac Electric Power Company should be denied."

In the brief for the petitioner the following conclusion is stated:

> "The Legislature granted a valid franchise to Great Falls. No act of the Legislature has withdrawn or abrogated such franchise, it has not been forfeited by either Great Falls or Pepco, and it has been duly acquired by Pepco. Since no consent of the authorities of Montgomery County is required to permit the exercise of the franchise in the County, the application of Potomac Electric Power Company should be granted."

It is the finding of the Commission that public welfare and convenience require that Potomac Electric Power Company continue to supply electric service in Montgomery County and that the Company continue to meet its obligations with regard to extensions and improvements of its electric distribution system in that county.

Potomac Electric Power Company has rendered adequate electric service in Montgomery County over a long period of years and it appears that such service has been rendered without the use of the franchise which it acquired from Washington Railway and Electric Company in 1947. The testimony with respect to the exercise by Great Falls Power Company and Washington Railway and Electric Company shows that practically little was done, and what was done was insignificant and can hardly be said to be an effective use of said franchise. A witness for Potomac Electric Power Company testified that Great Falls Power Company did not conduct any operations in Montgomery County or anywhere in the State of Maryland as an electric power company and that the Company merely owned a power site and retained such rights as it had in that power site. His testimony further shows that Great Falls Power Company did not at any time during the period from 1894 to 1947 install, operate or maintain any works, plant or system for the manufacture, transmission or supply of electricity for heat, light or power either in Montgomery County or anywhere in the State of Maryland. However, Potomac Electric Power Company has acquired whatever right, if any, that its predecessors had to the franchise. Although the Commission does not find that Potomac Electric Power Company has actually exercised the franchise which is the subject matter of this case, nevertheless the exercise of the franchise may in some manner be useful in the rendition of public service, and the Commission should allow Potomac

Electric Power Company to exercise any franchise it may have acquired from Washington Railway and Electric Company.

IT IS, THEREFORE, this 15th day of May, in the year Nineteen Hundred and Fifty-three, by the Public Service Commission of Maryland,

ORDERED: That Potomac Electric Power Company be, and it is hereby, authorized to exercise such franchise as it may have acquired from Great Falls Power Company directly or indirectly through some intermediary corporation as set forth in this proceeding, and that such acquisition be, and it is hereby, approved,

PROVIDED, however, that nothing herein contained shall operate to affect in any way any rights that Montgomery County, Maryland, may have with respect to Potomac Electric Power Company.

Commissioners

APPENDIX F – Statement of Work

ORDER NO. 83526

IN THE MATTER OF AN INVESTIGATION INTO

THE RELIABILITY AND QUALITY OF THE

ELECTRIC DISTRIBUTION SERVICE OF

POTOMAC ELECTRIC POWER COMPANY

*

*

*

*

BEFORE THE

PUBLIC SERVICE COMMISSION

OF MARYLAND

CASE NO. 9240

ORDER INITIATING PROCEEDING

To: Potomac Electric Power Company; Maryland Office of People's Counsel; Technical Staff of the Public Service Commission; and Interested Persons

The Public Service Commission ("Commission") hereby initiates a proceeding to investigate the reliability of Potomac Electric Power Company's ("Pepco") electric distribution system and the quality of electric distribution service that Pepco is providing its customers. In 2010, Pepco's performance in responding to power outages caused by severe weather in its service area, the number of power outages and duration of the power outages that occurred as a result of these storms, and the number of customers affected, have resulted in a large number of complaints from the public to the Commission. For example, Pepco reported that recent power

outages on July 25, 2010, August 5, 2010, and August 12, 2010 affected 297,000 customers, 75,000 customers, and 98,000 customers, respectively. The Commission also has received complaints of frequent and apparently inexplicable outages occurring outside of storm events. Additionally, customers have complained about Pepco's failure to communicate effectively with its customers during outages – in part due to the apparent failure of Pepco's automated communications system.

Because of the frequency, number and duration of the power outages experienced by customers in the Pepco service area and the apparent breakdown of adequate communication between the company and its customers during these outage events, the Commission finds it necessary to conduct an immediate investigation into the reliability of the Pepco distribution system and the quality of distribution service Pepco is providing its customers, including but not limited to its performance during and following severe storms, and a comprehensive examination of Pepco's storm preparedness and reliability. Accordingly, the Commission hereby institutes this proceeding to investigate these issues, including but not limited to the following:

- The number of customers affected by recent power outages;
- The root causes for the scope, frequency and duration of outages – either storm or non-storm related;
- The communications failures that have occurred and continue to occur between Pepco and affected customers; and
- Pepco's inability to communicate estimated times of restoration to affected customers in a timely manner.

IT IS THEREFORE, this 12th day of August, in the year Two Thousand and

Ten, by the Public Service Commission of Maryland,

ORDERED: 1) That Potomac Electric Power Company is directed to cause:

- the Company's Chief Operating Officer;
- the Company's senior officer(s) responsible for system reliability and construction and maintenance;
- the Company's senior officer(s) responsible for storm restoration;
- the Company's senior officer(s) responsible for customer service, specifically customer communications; and
- any other appropriate Company representatives that can provide substantive responses to Commission inquiries on system reliability and service quality of the Company

to appear at a legislative-type hearing to be held on Tuesday, August 17, 2010, in the Commission's 16th Floor Hearing Room, William Donald Schaefer Tower, 6 Saint Paul Street, Baltimore, Maryland 21202, beginning at 9:30 a.m. The purpose of the hearing is for the Company to respond to questions from the Commission and for the Commission to frame the procedures by which the investigation will be conducted.

By Direction of the Commission

Terry J. Romine

Executive Secretary

NOTICE EXPANDING SCOPE OF ISSUES

To: Service List in Case No. 9240

On August 12, 2010, the Public Service Commission ("Commission") initiated a proceeding to investigate the reliability of Potomac Electric Power Company's ("Pepco") electric distribution system and the quality of electric distribution service that Pepco is providing its customers. On October 20, 2010, the Commission established a procedural schedule that will include evidentiary hearings beginning on June 16, 2011. Prior to the evidentiary hearings, the Commission will receive a report from consultants hired to review and make recommendations regarding the reliability of Pepco's distribution system and the quality of service it provides its customers. The Commission also will receive written testimony from the parties to this case.

The Commission hereby asks the parties to include in testimony they file in this case any suggested remedies the Commission should consider imposing on Pepco if the Commission were to find that Pepco has failed to maintain a reliable system or to provide reliable service to its customers. The parties' suggested remedies may include, but need not be limited to, imposition of civil penalties pursuant to §§ 13-201 and 13-202 of the Public Utilities Article, *Annotated Code of Maryland* ("PUA"); change(s) in the schedule or manner of operations pursuant to PUA § 5-101(c)(2); modification of the Company's service territory or revocation of the Company's authority to exercise its franchise(s) pursuant to PUA § 5-201;[1] or any other remedies that the parties believe appropriate.

By Direction of the Commission

Terry J. Romine

Executive Secretary

APPENDIX G – Data Requests

Below is a compilation of Montgomery County Data Requests cited in this report.

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MD MC OCP DATA REQUEST NO. 1

QUESTION NO. 2

Q. IN THE RELIABILITY PLAN, THERE ARE A BUNCH OF STATISTICS (AS PASTED BELOW) FOR PEPCO'S MARYLAND HOLDINGS. CAN WE GET THESE NUMBERS FOR MONTGOMERY COUNTY ALONE? ARE THERE OTHER #S LIKE THIS – IE # OF FEEDERS THAT SERVE MORE THAN A CERTAIN # OF PEOPLE, # OF DISTRIBUTION CIRCUITS, ETC?

22 TRANSMISSION SUBSTATIONS
39 SUB-TRANSMISSION SUBSTATIONS
116 DISTRIBUTION SUBSTATIONS
14,266 MILES OF OVERHEAD LINES
10,718 MILES OF UNDERGROUND CABLE
2,945 MILES OF UNDERGROUND CONDUIT

RESPONSE:

A. Statistics readily available for Montgomery County, only:

6 transmission substations
10 sub-transmission substations
34 distribution substations
4,715 linear miles of overhead lines (includes Primary, Secondary and Secondary Service)
6,547 linear miles of underground cable (includes Primary, Secondary and Secondary Service)

Jurisdictional breakdown of underground conduit is not available.

SPONSOR: WILLIAM M. GAUSMAN

QUESTION NO. 2

Q. SPECIFICALLY, ARE THERE ANY ISSUES OR BARRIERS CREATED BY GOVERNMENT JURISDICTIONS THAT AFFECT YOUR RESPONSIVENESS AND RELIABILITY SUCH AS IN SNOW CLEARING AND REMOVAL, ROW REGULATIONS, AND TREE TRIMMING REGULATIONS?

A. WHICH ARE GOVERNMENT RELATED? PLEASE PROVIDE A DETAILED EXPLANATION WITH DOCUMENTATION.

B. WHICH ARE NOT GOVERNMENT RELATED? PLEASE PROVIDE A DETAILED EXPLANATION WITH DOCUMENTATION.

RESPONSE:

A. Vegetation is the largest cause affecting overhead electric distribution reliability, specifically the impact of trees and tree limbs falling into the Company's overhead conductors and associated overhead electric plant including transformers, switches, cross arms, fuses, and lightning arrestors.

The majority of traditional tree trimming is "clearance" trimming. The objective of clearance trimming is to avoid contact between a tree limb and the overhead electric conductor and associated overhead electric plant. Contact with the electric plant can cause electric outages and equipment damage.

Clearance trimming addresses "grow in" of the vegetation to the point where it contacts the electric plant and interferes with its operation.

Clearance trimming is not designed to avoid electric outages which are caused when the trees fail (either limbs or the entire tree) and drop/fall into the electric plant.

During storms (e.g., ice, wind, snow) it is typically tree failures that cause the electric plant to fail.

In Case No. 9217 (Pepco Maryland), the Commission approved with conditions a funding method for the Enhanced Integrated Vegetation Management (EIVM) program that is designed to increase electric distribution reliability by removing trees, limbs and other vegetation that can cause outages during storm events.

The EIVM program includes four components or areas of work (Please refer to Company Witness Gausman's Direct Testimony in Case No. 9217, pages 12 through 17) that were proven effective in increasing electric distribution reliability

in a pilot program conducted on the Pepco Maryland system in 2007, 2008 and 2009. These areas of work are:

- Hazard tree removal
- Removal of overhanging limbs
- Removal of undergrowth
- Aggressive clearance pruning

To gain the best result from its vegetation management plan, the Company needs increased authority to enter private property to remove private trees and the cooperation of government entities that manage and own public rights of way ("ROW").

Where the removal of canopy or overhanging limbs of private trees will not materially remove the threat of damage to the electric plant, the Company will need the ability to remove a "hazard tree" in its entirety where it is damaged, diseased or otherwise presents a danger to the electric plant. These damages are not limited to the electric service of the tree owner but cause feeder damage and up stream substation operations damage that can interrupt service to thousands of customers.

Currently, private property owners may deny the Company permission to remove a tree that threatens electric plant. While the Company seeks to work with the property owner to explain the need for the tree removal and to address concerns to the extent possible, ultimately the private property owner can elect to refuse removal and so threaten the reliability of the electric plant. Changes in law are needed to provide the Company with the right to remove hazard trees located on private property where the owner refuses consent..

Similarly, the Company faces a complex process to remove trees from public ROWs. The Maryland Forest Service issues Tree Removal Permits for Roadside Trees. Their staff reviews permit applications and issues the permit if they agree with the request. The permit must also be approved by the ROW owner. Nearly every feeder is constructed on multiple roads owned by different municipalities so Pepco frequently has to meet with multiple municipal arborists. Depending on what entity owns the road ROW, Pepco might have to get permission from any one of the following:

- The State Highway Administration;
- Montgomery County Department of Transportation - Street Tree Division;
- City of Rockville;
- Gaithersburg;
- Takoma Park;
- Town of Chevy Chase;
- Chevy Chase Section 3;
- Chevy Chase Section 5;

- Chevy Chase View;
- Chevy Chase Village;
- Friendship Heights;
- Garrett Park;
- Kensington;
- Martin's Additions;
- North Chevy Chase; and
- Somerset in Montgomery County.

The Company works closely with the Maryland Forest Service and the localities to provide any needed information and to maintain an efficient process, however the ROW owner may refuse the requested tree removal. As with private landowners, public ROW owners can make decisions that potentially threaten reliability and the Company has limited recourse.

The Company also needs the support of the State and local authorities to promulgate and enforce regulations to promote the "right tree, right place" program. Effective regulations would (a) require the removal of hazard trees that pose a risk of electric outages; (b) prohibit the planting of tree and other plant species that have the propensity to grow tall enough or in a manner that threatens the electric distribution system; and (c) encourage planting species whose growth patterns reduce the threat to the electric distribution system. A program such as this should apply both to private property and public ROW.

For a general description of the "right tree, right place" guidelines, please see Pepco's web site at http://www.pepco.com/home/emergency/veg/right/. Information is also available on the Maryland Commission's web site at http://webapp.psc.state.md.us/Intranet/ElectricInfo/righttreeposter3-2-07final.ppt#260,1,Slide 1. The "right tree, right place" program will lead to reduced pruning and other maintenance costs, increase reliability, and promote esthetics.

Unfortunately, voluntary compliance is not likely to accomplish the desired results. By way of example, the Company notes that recently large growth trees (such as oaks and other species) were planted in the public right of way under the power lines along Route 28 North, north of Black Rock Road in Montgomery County. The Company at this time does not know who planted the trees or why the trees were planted at that location. However, those trees, which today stand only six feet high, will inevitably grow into the power lines and likely lead to reliability concerns. The Company may seek to prune them in the future and ultimately remove them, but then society incurs a cost (esthetically as well as monetarily) that could have been avoided by planting an appropriate tree in the first place.

SPONSOR: George P. Nelson

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MD MC OCP DATA REQUEST NO. 2

QUESTION NO. 7

Q. WHAT ISSUES STILL EXIST REGARDING COLLABORATION EFFORTS BETWEEN GOVERNMENT AGENCIES AND OTHER PUBLIC SERVICE ORGANIZATIONS? WHAT ARE YOU DOING TO ADDRESS THESE ISSUES? PLEASE PROVIDE A DETAILED EXPLANATION WITH DOCUMENTATION.

RESPONSE:

A. Issues related to collaboration with government agencies and other public service agencies during emergencies center in two areas.

(1) A reluctance by some agencies to use the established County Emergency Operations Center as a coordination point with supporting agencies as well as for the prioritization of requirements based on overall community needs and not the individual agency.

(2) The quality and format of lists received from the government agencies. These lists are for Wires Down, Wire Down w/ road closure and Tree Down with wires and are provided by EMA, DPW/DOT, Fire/EMS or other agencies. The format and quality of data are inconsistent between jurisdiction and agencies and in some cases is incomplete. In addition, when these issues are identified, they are reviewed at post event after action review meetings but the corrections are retained by the respective agencies.

SPONSOR: George P. Nelson

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MD MC OCP DATA REQUEST NO. 2

QUESTION NO. 9

Q. HOW DO YOU MEASURE SUCCESS IN RESTORING POWER IN BLUE SKY OR MAJOR EVENTS? WHAT IS THE DIFFERENCE BETWEEN PEPCO AND BEST PRACTICES IN TERMS OF PLANS AND PROCEDURES? PLEASE PROVIDE A DETAILED EXPLANATION ALONG WITH DATA AND DOCUMENTATION.

A. WHAT ARE YOUR RESTORATION PRIORITIES? PLEASE PROVIDE A DETAILED EXPLANATION WITH DOCUMENTATION.
B. WHAT ARE YOUR RESULTS? HOW ARE YOU MEASURING RESULTS? PLEASE PROVIDE A DETAILED EXPLANATION WITH DATA AND DOCUMENTATION.
C. WHAT REQUESTS FOR FUNDING IN RESTORATION PRIORITIES HAVE YOU MADE? WHAT HAS BEEN IMPROVED? WHAT HAS BEEN DENIED? PLEASE PROVIDE A DETAILED EXPLANATION ALONG WITH DATA AND DOCUMENTATION.
D. YOU HAVE PROPOSED A SIX POINT RELIABILITY ENHANCEMENT IMPROVEMENT PLAN. WILL YOU IMPLEMENT THIS PLAN REGARDLESS OF APPROVAL FROM THE PSC FOR A RATE INCREASE? PLEASE PROVIDE A DETAILED EXPLANATION WITH DATA AND DOCUMENTATION.

PEPCO'S RESPONSE: January 28, 2011

A. A. Our damage assessment and restoration process begins once the storm has passed and it's safe for our personnel to proceed with gathering information and determining the extent of the damage in the affected areas. Customer telephone calls reporting outages are vital because they are combined with other customers' calls and computer programs analyze call information to predict lines or other equipment that may be out of service. These predictions help our line crews find the outage locations more quickly.

We then proceed using a system of priorities that have been developed taking into account public safety, community needs and the nature of the electric distribution system.

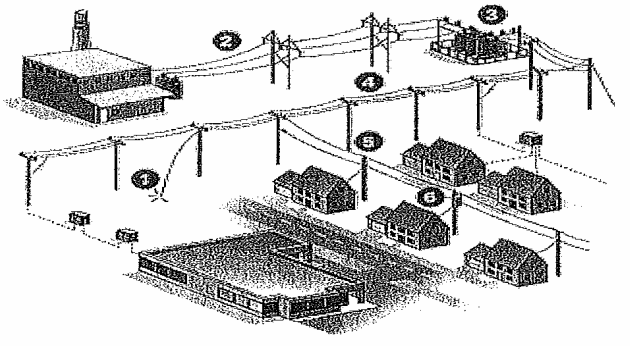
We first work to correct potentially life-threatening situations, such as downed live wires and public health and safety facilities without power. Crews responding to downed wires may not be able to restore power. They are sent to make the area safe until repair crews can be dispatched.

We work closely with federal, state and local emergency management agencies to constantly reassess our restoration priorities.

We then work "downstream" beginning with any problems with the transmission or large distribution lines and focus on restoring power in a sequence that first considers public health and safety, and restores power to the greatest number of customers as quickly as possible. Similar to snow storms, it is not possible to plow side streets before the main thoroughfares are cleared, during a power outage it is not possible to correct problems at individual locations before main substations and distribution feeders are restored.

Next, we work to restore secondary distribution lines serving commercial areas, subdivisions and neighborhoods, working our way down through lines that serve smaller groups of customers, and finally, to individual homes and businesses.

The Power Restoration Process in Brief



In the event our system is damaged by severe weather, Pepco repairs equipment which will restore the largest numbers of customers first. Generally, the sequence is as follows:

1. Downed live wires or potentially life-threatening situations and public health and safety facilities without power.
2. Transmission lines serving thousands of customers.
3. Substation equipment.
4. Main distribution lines serving large numbers of customers.
5. Secondary lines serving neighborhoods.
6. Service lines to individual homes and businesses.

B. For Blue Sky events, Pepco measures performance based on The System Average Interruption Duration Index (SAIDI). SAIDI is commonly used as a reliability indicator by electric power utilities and is the average outage duration for each customer served. SAIDI is measured in units of time, often minutes or hours and is calculated as: the sum of all customer interruption durations divided by the total number of customers served.

For major events, there is no normal basis for performance measurement because all major events are different. For this reason, all utilities eliminate Major Event Days (MED)s form their reliability measurements.

C. Pepco does not understand the term "funding for restoration priorities". Pepco is entitled to recover its costs incurred for the restoration of electric service to its customers. Moreover, Pepco is entitled to full recover of these costs in a timely manner.

D. Pepco has committed to a Six Point Reliability Enhancement Program for Maryland. Pepco is entitled to recover the full costs of implementing this plan in a timely fashion.

FOLLOW-UP REQUEST: March 8, 2011

Q. HOW DOES PEPCO DEFINE SUCCESS? PLEASE PROVIDE A CLEAR DEFINITION. SPECIFICALLY HOW DOES PEPCO IDENTIFY METHODS IN WHICH THEY HAVE BEEN SUCCESSFUL? DOES PEPCO MEASURE SUCCESS BASED ON ANNUAL IMPROVEMENTS IN THEIR NATIONAL RANKING QUARTILE? IS SUCCESS MEASURED BASED ON INCREASED CUSTOMER SERVICE SATISFACTION? FAILURE TO ADDRESS THE SPECIFIC QUESTIONS ENTIRELY WILL RESULT IN AN ASSUMPTION THAT AN ANSWER CAN NOT BE GIVEN.

PEPCO'S FOLLOW-UP RESPONSE: March 25, 2011

A. Pepco defines success by combining both quantitative and qualitative metrics. From a quantitative perspective, Pepco primarily defines success through standard industry metrics, i.e. achieving appropriate electric system outage frequency (SAIFI) and duration (SAIDI) goals. SAIDI[i] (System Average Interruption Duration) is an industry established reliability indicator and is the average outage duration for each customer served on the system. SAIFI[ii] (System Average Interruption Frequency) is the other industry reliability indicator which measures the average number of interruptions experienced by each customer on the system. Pepco has objectives aimed at improving SAIDI and SAIFI for the overall system level with a focus on improving performance on a feeder by feeder basis. Success is quantifiably measured by achieving year over year improvements in both of the aforementioned indices.

From a qualitative perspective, Pepco looks to customer satisfaction ratings/inputs when defining success for reliability. Pepco uses specific aspects

of the MSI survey to track its customer's perception of the level of service provided, i.e. reliability and restoration practices and results. Pepco believes that its reliability levels and restoration performances are an overall driver of customer satisfaction.

Pepco does not measure success based on annual improvements in national industry quartile ranking for SAIDI and SAIFI. Pepco believes that while the national ranking provides overall context and perspective for its performance, the results can be misleading as an absolute measure. Pepco of course consults these data but as index participants vary, quartiles[iii] can fluctuate. Pepco uses its own improvement targets in these areas to measure its success in achieving improvements in reliability performance.

Also, there is no "true" national industry quartile representation. Participation in the various benchmarking studies is voluntary and the number of participants can vary from 20 to 100+, depending on the survey, resulting in a force ranking of the participants to determine quartile placement. In other words, only 25% of the participants, no matter how large or small the panel, can be first quartile. For the above reasons, Pepco does not measure success based on annual improvements in its national quartile ranking.

Further, grouping utilities reliability performance data into national quartiles, while providing an overall picture of national performance, does not serve to sufficiently explain the apparent and innate differences in utility design practices, weather patterns, the age of the system, growth impacts, and geographical elements. Factors like these can have a major impact on reliability and must be taken into account when comparing different distribution systems.

Overall, Pepco measures success by being on a steady and constant glide path towards improving its performance on a year over year basis.

[i] SAIDI- System Average Interruption Duration Index. The average time each customer is without service on an annual basis. Total Number of Customer Minutes of Interruption / Total Number of Customers Served.
[ii] SAIFI - System Average Frequency Interruption Index. The average number of outages experienced by each customer in a year. Total Number of Sustained Customer Interruptions / Total Number of Customers Served.
[iii] Quartiles and means/medians -- when there is an even distribution of numbers, all quartile break point are equally spaced and mean = median.

SPONSOR: Michael W. Maxwell

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MD MC OCP DATA REQUEST NO. 2

QUESTION NO. 12

Q. IN THE WITT REPORT ON PAGE 4, IT WAS RECOMMENDED THAT MEMORANDUMS OF UNDERSTANDING GUIDE THE OPERATIONS OF PEPCO AND COMPONENTS OF THE COMMUNITY IN JOINT RESTORATION PROCESSES. PLEASE DEFINE COMMUNITY. WHAT MOU'S HAVE YOU ENTERED INTO AND WITH WHOM? PLEASE PROVIDE THESE MEMORANDUMS AS WELL AS SPECIFIC DETAILS WITH DATA AND DOCUMENTATION.

PEPCO'S RESPONSE: January 28, 2011

A. In order to maintain consistency across all jurisdictions in which it serves, Pepco does not customize restoration priorities with individual Emergency Management Agencies (EMAs). Instead, Pepco has taken steps to communicate the restoration priorities with emergency management officials, community leaders and customers. Through these discussions, Pepco gains insight into the needs of the community and will consider changes to these priorities, if warranted.

FOLLOW-UP REQUEST: March 8, 2011

Q. HAS PEPCO ENTERED INTO MOUS WITH COMMUNITIES? WHAT MOUS ARE CURRENTLY IN PLACE? IF PEPCO DOES NOT HAVE MOUS, PLEASE STATE SO. FAILURE TO ADDRESS THE QUESTIONS ENTIRELY WILL RESULT IN AN ASSUMPTION THAT AN ANSWER CAN NOT BE GIVEN.

PEPCO'S FOLLOW-UP RESPONSE: March 22, 2011

A. No. Pepco did not agree with the Witt recommendation that MOUs should be established to guide the operations of Pepco and components of the community in joint restoration processes and; therefore, Pepco has not established MOUs with communities.

SPONSOR: George P. Nelson/ Michael W. Maxwell

QUESTION NO. 16

Q. IN THE PEPCO HOLDINGS, INC. RESPONSE ASSESSMENT TO THE WITT REPORT ON PAGES 4 AND 5, PEPCO COMMITTED TO IMPLEMENTING "STORM HARDENING" MEASURES. PLEASE DEFINE "STORM HARDENING". PLEASE PROVIDE A SUMMARY OF YOUR VEGETATION MANAGEMENT PROGRAM.

A. WHAT IS YOUR CURRENT APPROACH TO "STORM HARDENING" FOR TREE AND VEGETATION MANAGEMENT? PLEASE PROVIDE SPECIFIC DETAILS OF YOUR VEGETATION MANAGEMENT IN TERMS OF POLICIES AND PROCEDURES.

B. WHAT MEASURES HAVE YOU IMPLEMENTED? PLEASE PROVIDE A DETAILED EXPLANATION WITH DATA AND DOCUMENTATION.

C. WHAT HAVE BEEN THE RESULTS OF VEGETATION MANAGEMENT IN THE PAST TWO YEARS? HOW ARE YOU MEASURING THESE RESULTS? PLEASE PROVIDE A DETAILED EXPLANATION WITH DATA AND DOCUMENTATION.

D. WHAT ISSUES ARE CURRENTLY PREVALENT IN REGARDS TO TREE AND VEGETATION MANAGEMENT? WHAT ARE YOU CURRENTLY DOING TO ADDRESS THESE ISSUES? PLEASE PROVIDE ALL DATA AND DOCUMENTATION.

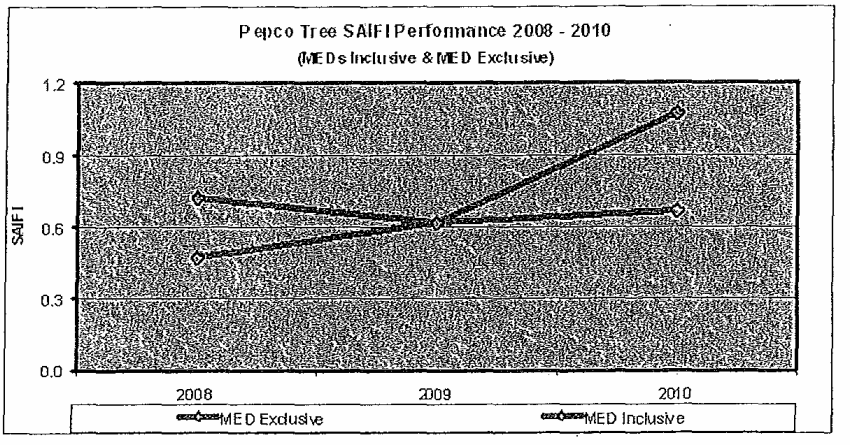
RESPONSE:

A. a) Pepco's Enhanced Integrated Vegetation Management (EIVM) is described in the response provided to Montgomery Data Request No. 2-2. The EIVM is implemented as appropriate to increase the reliability of feeders and associated overhead electric plant.

b) Pepco has implemented the EIVM program in its Maryland Jurisdiction. Please refer to Mr. Gausman's Direct Testimony in Case No. 9217 for a full definition of Pepco's EIVM program.

c) As a result of outages associated with trees and vegetation over the past few years, and the successful trial results highlighted in Mr. Gausman's testimony and data requests in Case No. 9217, Pepco began implementation of its EIVM program in September of 2010 to reverse the growing trend of vegetation caused outages. Tree SAIFI (that portion of system SAIFI directly attributable to tree caused outages) accounts for 27%, 36% and 34% of the total Pepco system SAIFI for 2008, 2009 and 2010 respectively at Major Event Day (MED) Exclusive Category.

Including MED, TreeSAIFI accounted for 31%, 36% and 33% of the total Pepco system SAIFI for 2008, 2009 and 2010 respectively.



d) There are two issues currently prevalent in regard to tree and vegetation management: (1) public space tree removal permits; and (2) sensitive customers.

The process to get a permit to remove a pubic space tree or roadside tree is somewhat complex. The Maryland Forest Service issues Tree Removal Permits for Roadside Trees. Their staff reviews permit applications and issues the permit if they agree with the request. The permit must also be approved by the ROW owner. This means that depending on who owns the road ROW, Pepco might have to get permission from any one of the following: the State Highway Administration, Montgomery County Department of Transportation - Street Tree Division, City of Rockville, Gaithersburg, Takoma Park, Town of Chevy Chase, Chevy Chase Section 3, Chevy Chase Section 5, Chevy Chase View, Chevy Chase Village, Friendship Heights, Garrett Park, Kensington, Martin's Additions, North Chevy Chase, and Somerset in Montgomery County for example.

To speed up the permitting process, Pepco has implemented a procedure where a contract forester meets on site with the ROW owner to review all proposed public space tree removals prior to submitting the Roadside Tree Removal Application to the Maryland Forest Service so that every tree on the application had already been approved by the ROW owner. If the ROW owner refuses to approve the requested tree removal, the owner is identified as a Sensitive Customer in the VM GIS planning tool. This has reduced the turn around time for Roadside Tree Removal permits from 90 days to between 15 and 30 days. Nearly every feeder is

constructed on multiple roads owned by different municipalities so Pepco frequently has to meet with multiple municipal arborists prior to submitting the permit application.

Sensitive customers are the second prevalent issue that Pepco faces in regard to tree and vegetation management. Pepco has a feature in its work planning software entitled Sensitive Customer. The Company uses this field to capture information about a customer, commercial property, public agency, municipality, or other entity that does not allow us to complete the Vegetation Management work that has been identified as necessary to maintain reliable electric service. In mid-2010, Pepco began capturing a picture of the tree/vegetation that is in question. Issues that might qualify as a sensitive customer include:

- Request that a Pepco forester or contract forester be present while work is performed
- Refusal to allow tree contractor to attain proper clearance between the tree and the energized equipment
- Refusal to allow any tree pruning at all
- ROW owner's refusal to approve requested tree removal
- Private property owner's refusal to allow requested tree removal

SPONSOR: George P. Nelson

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MD MC OCP DATA REQUEST NO. 2

QUESTION NO. 24

Q. SEVERAL UTILITIES MONTGOMERY COUNTY WORKS WITH HAVE NOTIFICATION SYSTEMS WITH SPECIFIC TRIGGERS THAT GENERATE ALERTS TO THE COUNTY (PROVIDED BY PHONE, E-MAIL AND/OR TEXT MESSAGE). DOES PEPCO HAVE SUCH A SYSTEM OR ARE THEY WILLING TO IMPLEMENT SUCH A SYSTEM TO NOTIFY THE COUNTY OF SIGNIFICANT OUTAGES OR ISSUES?

RESPONSE:

A. Pepco has evaluated this technology and has plans to deploy this capability for individual customers as part of the functionality and customer benefits of the Advanced Metering Infrastructure (AMI) in Maryland. While this capability would be available to individual customers only, Pepco could develop a separate method to send alerts to county officials and will further evaluate this option if requested by the county.

SPONSOR: Charles R. Dickerson

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MD MC OCP DATA REQUEST NO. 2

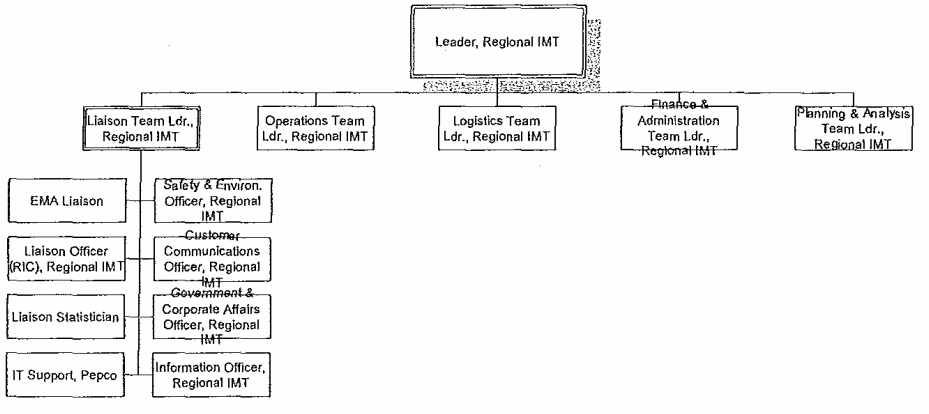
QUESTION NO. 34

Q. PLEASE PROVIDE THE NAMES OF THE 3 TO 5 REPRESENTATIVES YOU EXPECT TO SEND TO THE MONTGOMERY COUNTY EMERGENCY OPERATIONS CENTER AND WHO THEY REPORT TO IN THE ORGANIZATIONAL STRUCTURE DURING A SIGNIFICANT OUTAGE.

PEPCO'S RESPONSE: January 28, 2011

A. The Emergency Management Agency (EMA) Liaison serves as Pepco's representative to state and local EMAs when those Emergency Operations Centers are activated for power related issues. The EMA Liaison reports to the Liaison Team Leader, as shown in the diagram below.

There are currently nine Pepco employees assigned to the EMA Liaison Incident Response Role during storms or other emergencies. These individuals range in level from Senior Supervising Engineer to Group Manager and were selected based on their knowledge and experience related to Pepco field operations and restoration. Due to the nature of the event, the location and the availability of the individuals, it is not possible or practical to permanently assign any of these employees to a particular EMA. Assignments are made during activation of the plan, or if requested by an EMA.



FOLLOW-UP REQUEST: March 8, 2011

Q. WHAT DOES PEPCO BELIEVE THE BEST PRACTICES ARE FOR DETERMINING WHAT REPRESENTATIVES TO SEND TO THE EMERGENCY OPERATIONS CENTER? FAILURE TO ADDRESS THE QUESTIONS ENTIRELY WILL RESULT IN AN ASSUMPTION THAT AN ANSWER CAN NOT BE GIVEN.

PEPCO'S FOLLOW-UP RESPONSE: March 22, 2011

A. A Pepco Liaison should be knowledgeable of Pepco's restoration processes and supporting technologies, System Operations personnel, the geographic areas under control of the Emergency Operation Center (EOC), and an understanding of the Incident Command System (ICS). Expectations are defined in the Pepco EMA Liaison Handbook.

SPONSOR: George P. Nelson

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MC OCP DATA REQUEST NO. 3

QUESTION NO. 2

Q. BENEFIT-COST RELATIONSHIP

A. IN WHAT WAYS, IF ANY, DOES PEPCO USE BENEFIT-COST ANALYSIS IN DETERMINING ON HOW MUCH TO SPEND, WHAT TO SPEND IT ON, CONCERNING OUTAGE PREVENTION AND MITIGATION? ASSUMING PEPCO INTENDS TO RECOVER ITS COSTS FROM ITS CUSTOMERS, DOES IT AGREE THAT THOSE COSTS SHOULD BE DETERMINED IN RELATION TO BENEFITS?

B. WHAT ARE THE MAIN COST DRIVERS FOR (A) OUTAGE AVOIDANCE AND (B) OUTAGE MITIGATION?

C. WHAT ARE THE BENEFITS (ANSWERS AS QUANTITATIVELY AS POSSIBLE) ASSOCIATED WITH THESE COST DRIVERS?

D. DOES PEPCO MAKE DECISIONS CONCERNING WHAT TO SPEND ON OUTAGE AVOIDANCE BASED ON WHETHER IT THINK THE PSC WILL ALLOW RECOVERY OF SUCH EXPENDITURES? OR DOES IT MAKE THESE DECISIONS BASED ON ITS UNDERSTANDING OF ITS OBLIGATION TO SERVE?

E. WHAT STANDARDS HAS PEPCO SET FOR ITSELF CONCERNING OUTAGE PREVENTION AND OUTAGE MITIGATION?

F. WHAT INTERNAL PROCESS DOES PEPCO USE TO SET THESE STANDARDS? WHICH SPECIFIC OFFICIALS ARE INVOLVED? WHAT ARE THEIR SPECIFIC RESPONSIBILITIES AND THEIR ACTIONS? TO WHOM IN THE COMPANY ARE THEY ACCOUNTABLE? IN WHAT WAY IS ACCOUNTABILITY EFFECTED?

G. WHAT GUIDANCE HAS PEPCO RECEIVED FROM THE PSC CONCERNING EXPECTATIONS FOR OUTAGE PERFORMANCE?

RESPONSE:

A. A. Pepco makes its asset allocation decisions to provide all of its customers' reliable electric distribution service. The Company operates under the rules of the Commission and believes that costs prudently incurred in electric distribution services should be recovered by the Company in a

timely fashion. As an example, the least performing feeders that the Company identifies each year are identified for the specific purpose of reducing outages on these feeders. The Company inspects each feeder, determines the cause of the outages and designs a corrective action plan to improve the performance of these feeders. This plan is filed with the Commission each year. Each year the Company's planning organization reviews the loading on feeders and substations and determines when additional infrastructure is required and then evaluates various options to perform the work. Engineering determines the appropriate construction method based on locations, other facilities on the poles and amount of tree cover as potential impacts. Cost benefit analysis are performed when evaluating different options to perform required work. This work is intended to maintain or improve reliability to meet system growth or to accommodate the connection of new customers. Every project performed is done to meet one of these requirements. Work is not performed without a defined need for the project. The Commission reviews this expense when the Company seeks recovery of our cost during a base rate case.

B. The costs to provide electric distribution services are those that are included in its cost of service presentation, which is used by the Commission to set appropriate rates which will provide the Company with the opportunity to earn its authorized rate of return. The majority of the costs to perform this work include the cost of labor to design and construct new facilities, the costs of materials and equipment incorporated into the work and the costs of corporate indirect and overhead such as employee benefits and general and administrative expenses.

C. The Company is required to provide electric distribution service to all customers that request such services under the terms and conditions set by the Commission. Customers accrue benefits from this service based on their own assessment of the use they make of these services. As discussed in part A the benefits generated include the ability to provide electric service to new and existing customers and to operate the electric system without overloads and to meet the customers' peak electric demands that they place on the system. Electric system additions and improvements are designed to improve the reliability of the electric system.

D. Pepco only performs work when there is a need for the work and determines that the costs to perform this work are reasonable and that those costs will be prudently incurred. Therefore, the Company expects that all of our costs will be determined by the Commission to be prudent and that they will allow us the opportunity to fully recover those costs in a timely manner. The term outage avoidance is not defined and can mean many different things. The Company evaluates projects based on customer requests to obtain electric service, load growth and reliability

enhancements; all of which will provide reliable electric service to the customer. All projects evaluated and performed in this fashion will have the result of avoiding outages. If the stated work is not performed, the number of outages experienced would increase.

E. The Company has detailed construction standards that provide for safe and reliable construction of the electric system. In addition we comply with the National Electric Safety Code. The Company reviews circuit performance and if adverse trends are identified, corrective action is taken to improve the reliability of the system.

F. All engineering and operation personnel are responsible for operating and constructing the electric system in accordance with the Company standards and the National Electric Safety Code. Personnel responsible for the design of the system report to the Vice President of Asset Management. Personnel responsible for the construction, operation and maintenance of the system report to the Vice President of Operations and Engineering. These vice presidents report to the Executive Vice President of Power Delivery.

G. Section 5-303 of the Public Utilities Article, *Annotated Code of Maryland*, provides as follows with respect to standards of service: "A public service company shall furnish equipment, services, and facilities that are safe, adequate, just, reasonable, economical, and efficient, considering the conservation of natural resources and the quality of the environment."

SPONSOR: The Company

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MC OCP DATA REQUEST NO. 3

QUESTION NO. 3

Q. UTILITY COMPENSATION

A. DESCRIBE ALL WAYS IN WHICH UNDER CURRENT MARYLAND PSC RULES AND ORDERS, PEPCO'S COMPENSATION IS AFFECTED BY OUTAGES. YOUR ANSWER SHOULD CONSIDER, BUT NOT BE LIMITED TO, THE FOLLOWING SUB-QUESTIONS:

1. IN THE CONTEXT OF A GENERAL RATE CASE, HOW ARE PEPCO'S BASIC REVENUE AND EXPENSE STREAM, AND ITS PROFITABILITY, AFFECTED BY OUTAGES? FOR EXAMPLE:

A. HOW DOES THE REDUCTION IN SALES DURING AN OUTAGE AFFECT PEPCO'S REVENUE AND PROFITABILITY?

B. HOW DO THE EXPENSES PEPCO INCURS DURING AN OUTAGE (AND AFTER AN OUTAGE, TO PREVENT RECURRENCE OF, OR MITIGATE EFFECTS OF, FUTURE OUTAGES) AFFECT PEPCO'S PROFITABILITY? DOES PEPCO HAVE TO ABSORB THESE EXPENSES OR IS PEPCO PERMITTED TO RECOVER THEM SOMEHOW (AND IF SO, PLEASE SPECIFY THE PROCESS BY WHICH THIS OCCURS)?

C. DO PEPCO'S BASE RATES ASSUME SOME LEVEL OF OUTAGES, INCLUDING REVENUE EFFECTS AND EXPENSE EFFECTS? IF SO, HOW DOES THAT ASSUMED LEVEL OF OUTAGES COMPARE WITH THE ACTUAL OUTAGE EXPERIENCE OVER THE PAST 10 YEARS?

D. PRIOR TO DECOUPLING AS ORDERED BY THE MARYLAND COMMISSION IN ORDER 81517, CASE NO. 9092 (JULY 19, 2007) IS IT CORRECT THAT PEPCO'S PROFITABILITY DEPENDED IN LARGE PART ON KWHS SOLD, BECAUSE THE RATE STRUCTURE PROVIDED FOR RECOVERY OF FIXED COSTS THROUGH THE VARIABLE CHARGE? PLEASE PROVIDE SOME REAL WORLD EXAMPLES OF HOW A PARTICULAR OUTAGE

CAUSED A REDUCTION IN PROFITS DUE TO THIS PRE-DECOUPLING RATE STRUCTURE.

2. ONCE THE PSC HAS ESTABLISHED RATES IN A GENERAL RATE CASE, DO COMMISSION RULES PRESCRIBE ANY OTHER PROFITABILITY EFFECTS FROM AN OUTAGE, IN TERMS OF PENALTIES OR REWARDS? PLEASE EXPLAIN AND CITE ANY SUCH RULES.

B. DOES THE MD PSC'S DECOUPLING ORDER IN ORDER 81517, CASE NO. 9092 (JULY 19, 2007) IN ANY WAY CHANGE HOW PEPCO'S COMPENSATION IS AFFECTED BY OUTAGES? FOR EXAMPLE, IF IN THE PRE-DECOUPLING ERA PEPCO EXPERIENCED PROFIT LOSS IN AN OUTAGE BECAUSE ITS FIXED COST RECOVERY DEPENDED ON KWH SALES, DOES DECOUPLING ELIMINATE, OR REDUCE, ANY PROFIT LOSS FROM AN OUTAGE BECAUSE FIXED COSTS ARE RECOVERED INDEPENDENT OF SALES?

C. SAME QUESTION AS IMMEDIATELY ABOVE, FOR EACH PEPCO AFFILIATE SERVING IN A JURISDICTION OTHER THAN MARYLAND.

D. PSC PRACTICES ASIDE, DOES MARYLAND STATUTORY OR CASE LAW PRESCRIBE OR AUTHORIZE ANY PENALTIES FOR A UTILITY'S OUTAGE PERFORMANCE? FOR EXAMPLE:

1. CAN PEPCO BE SUED FOR DAMAGES ASSOCIATED WITH ITS ORDINARY NEGLIGENCE, IF THAT NEGLIGENCE CAUSED AN OUTAGE OR CONTRIBUTED TO ITS DURATION?

2. WHAT WOULD BE EXAMPLES OF ORDINARY NEGLIGENCE LEADING TO AN OUTAGE OR CONTRIBUTING TO ITS DURATION?

3. ARE THERE ANY PEPCO ACTIONS ASSOCIATED WITH OUTAGES IN THE PAST 2 YEARS THAT PEPCO WOULD CONSIDER EXAMPLES OF ORDINARY NEGLIGENCE?

4. PLEASE ANSWER THE IMMEDIATELY PRECEDING THREE QUESTIONS, SUBSTITUTING "GROSS NEGLIGENCE" FOR "ORDINARY NEGLIGENCE."

E. OUR UNDERSTANDING IS THAT PEPCO HAS THE EXCLUSIVE RIGHT AND OBLIGATION TO BE THE SOLE PROVIDER OF RETAIL DISTRIBUTION SERVICE IN ITS MARYLAND SERVICE TERRITORY. (WE ARE REFERRING HERE TO THE PROVISION OF PHYSICAL DISTRIBUTION SERVICE, NOT THE SALE OF RETAIL ELECTRICITY,

WHICH WE UNDERSTAND IS NOT EXCLUSIVELY PEPCO'S RIGHT BUT CAN BE ENGAGED IN BY COMPETING RETAIL SELLERS.)

1. IS THIS UNDERSTANDING ACCURATE? IF NOT, HOW WOULD YOU REWRITE THE STATEMENT TO MAKE IT ACCURATE?

2. WHAT IS THE PRECISE LEGAL SOURCE OF PEPCO'S EXCLUSIVE RIGHT AND OBLIGATION? IS IT A STATUTE, A COMMISSION ORDER, A FRANCHISE AGREEMENT? PLEASE PROVIDE THE LEGAL DOCUMENTATION; OR, IF NO SUCH DOCUMENTATION EXISTS, THEN PROVIDE A FULL LEGAL EXPLANATION OF THE BASIS OF PEPCO'S EXCLUSIVE RIGHT AND OBLIGATION TO SERVE.

3. BASED ON THE DOCUMENTATION AND EXPLANATION PROVIDED IN RESPONSE TO THE PRECEDING QUESTIONS: UNDER WHAT CIRCUMSTANCES, BY WHAT BODY AND BY WHAT PROCEDURES, CAN MARYLAND REMOVE PEPCO'S EXCLUSIVE RIGHT TO SERVE?

4. DOES PEPCO CONSIDER ITS CURRENT OUTAGE PERFORMANCE SUFFICIENT GROUNDS FOR LOSING ITS RIGHT TO SERVE? PLEASE EXPLAIN YOUR ANSWER IN DETAIL. IF THE ANSWER IS NO, WHAT FEATURES WOULD PEPCO'S OUTAGE PERFORMANCE HAVE, FOR THAT PERFORMANCE TO BE SO POOR THAT PEPCO SHOULD LOSE ITS RIGHT TO SERVE?

F. CONCERNING OTHER STATES' TREATMENT OF THE RELATIONSHIP BETWEEN A UTILITY'S OUTAGE PERFORMANCE AND ITS PROFITABILITY:

1. WHAT ARE EXAMPLES OF EFFECTIVE TREATMENT, IN THAT THEY ALIGN PROFITABILITY WITH PERFORMANCE?

2. WHAT ARE EXAMPLES WHERE PENALTIES ARE INSUFFICIENT OR REWARDS EXCESSIVE?

3. WHAT ARE EXAMPLES WHERE PENALTIES ARE EXCESSIVE OR REWARDS INSUFFICIENT?

G. WHAT IS YOUR ASSESSMENT OF MARYLAND'S PRESENT APPROACH TO COMPENSATION RELATED TO OUTAGE PERFORMANCE?

H. WHAT TYPE OF COMPENSATION ARRANGEMENT WOULD BEST INDUCE PEPCO TO ADDRESS OUTAGES EFFECTIVELY?

I. UNDER PRESENT MARYLAND STATUTES, ARE THERE ANY LIMITS ON THE TYPE AND QUANTITY OF PENALTY THE COMMISSION MAY IMPOSE FOR OUTAGES? PLEASE EXPLAIN IN DETAIL. [THE RESPONDENT SHOULD BE AN ATTORNEY WHO IDENTIFIES HER/HIMSELF.]

PEPCO'S RESPONSE: February 15, 2011

A. A). Please refer to the responses to items 1 & 2 below.

1) The Company presents its costs of service in a base rate proceeding in accordance with the requirements of the Commission.

a) Within the context of a base rate proceeding Pepco presents its revenue from electric distribution service for a 12 month test year in accordance with the requirements of the Commission. Any reductions in sales due to outages would be reflected in the cost of service.

b) Expenses incurred and / or forecasted to occur during the test year used in a base rate proceeding are presented within the Company's cost of service. The Commission reviews the appropriateness of the Company's expenses in setting the rates the Company must charge for its services.

c) No.

d) Prior to the Commission adopting the Billi Stabilization Adjustment, (BSA), Pepco's revenues were based upon the customers' volumetric use of electricity priced at the rates in effect as established by the Commission. This system allowed the Company the opportunity experience revenues above and below that found by the Commission as the appropriate level of revenue requirement as established by the Commission in the most recent base rate case. With the adoption of the BSA the Company is limited in its revenue to no more than the level of revenue requirement as established by the Commission in a base rate case proceeding

2) This question calls for a legal conclusion from the Company. Providing a more responsive answer is inappropriate due to attorney-client privilege, attorney work-product privilege and related legal concerns.

B) The Bill Stabilization Adjustment (BSA) is designed to help encourage the utility to promote energy efficiency measures be decoupling the link between usage and revenues. The BSA changes the way the utility recovers its costs. Instead of getting paid for how much electricity is sold, the Company only recovers the cost of maintaining and operating the electric system. The BSA stabilizes the delivery portion of customer bills. Prior to the implementation of the BSA, the primary means to recover these costs was through a $/kWh charge. Many factors effected how much was recovered including weather, customer usage, and outages. Under that system for example, the Company might over-recover during more extreme seasons (unseasonably hot summers or cold winters) while it might under-recover during milder than normal season.

During the past 12 months, the Company has over-recovered over $3.3 million from residential customers. With the BSA mechanism, this amount has been returned to customers. Before the BSA was implemented, customers would not have received this money. In addition, as part of the order implementing the BSA, the Commission reduced the Company's return on equity to reflect reduced risks. For Pepco, that reduction equals approximately $3.8 million annually. The $7.1 million combined effect of the over-recovery ($3.3 million) which was returned to customers and the $3.8 million of reduced return far exceeds the value of the unserved kWh from the outage. Therefore the Company's revenues have been lower with the BSA than they would have been under the prior system.

C) The only other jurisdiction served by a Pepco affiliate that has the BSA or any other decoupling mechanism is the District of Columbia. The DC BSA does have a major storm outage adjustment in which the revenues recovered are reduced by the value of the estimated outage kWh.

D) This question calls for a legal conclusion from the Company. Providing a more responsive answer is inappropriate due to attorney-client privilege, attorney work-product privilege and related legal concerns.

E) This question calls for a legal conclusion from the Company. Providing a more responsive answer is inappropriate due to attorney-client privilege, attorney work-product privilege and related legal concerns.

F) The studies and analyses with regard to "other states" and the request for the Company's position of the scope and effectiveness of regulation in "other states" have not been performed.

G) RM-43 initiated by the Commission on January 12, 2011, relates to proposed reliability and service quality standards. Until the Commission takes final action, the Company cannot make a final assessment.

H) The Company is highly motivated to address outages effectively.

I) This question calls for a legal conclusion from the Company. Providing a more responsive answer is inappropriate due to attorney-client privilege, attorney work-product privilege and related legal concerns.

FOLLOW-UP REQUEST: March 8, 2011

Q. **FOLLOW-UP QUESTION 3-3(E):**
PLEASE PROVIDE A COPY OF PEPCO'S FRANCHISE AGREEMENT TO PROVIDE SERVICE IN MONTGOMERY COUNTY.

PEPCO'S FOLLOW-UP RESPONSE: March 22, 2011

A. Please refer to Potomac Electric Power Company v. Birkett, 217 Md. 476, 143 A.2d 485 (1958), for a discussion of Pepco's franchise authority as exercised in Montgomery County, including the authority granted by the General Assembly of Maryland pursuant to Chapter 540 of the Acts of 1894 as amended by Chapter 245 of the Acts of 1900.

SPONSOR: The Company

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MC OCP DATA REQUEST NO. 4

QUESTION NO. 1

Q. STAFFING AND HUMAN RESOURCES: PLEASE PROVIDE A SUMMARY OF THE IN-HOUSE AND CONTRACTUAL FIELD FORCES THAT SUPPORT CURRENT INFRASTRUCTURE AND RESTORATION FROM MAJOR EVENTS FOR THE PEPCO MARYLAND REGION. ALSO PROVIDE A SUMMARY OF THE IN-HOUSE AND CONTRACTUAL WORKFORCE THAT SUPPORT CUSTOMER SERVICE ACTIVITIES. PLEASE INCLUDE THE FOLLOWING AS PART OF THE SUMMARY OR AS SUPPLEMENTAL INFORMATION:

A. PROVIDE THE TOTAL NUMBER OF FIELD EMPLOYEES ASSIGNED TO ONGOING OPERATIONS AND RESTORATION FROM MAJOR EVENTS. PROVIDE SIMILAR DATA FOR CUSTOMER SERVICE ACTIVITIES IN PEPCO MARYLAND REGION.

B. PROVIDE A BREAKDOWN OF THE NUMBER OF EMPLOYEES WHO ARE IN-HOUSE, UNION AND NON-UNION, AND CONTRACTUAL.

C. WHAT ARE PEPCO'S UNION AND CONTRACTUAL COSTS, BROKEN OUT SEPARATELY, PER 100,000 CUSTOMERS. PROVIDE DATA FOR THE 2008, 2009, AND 2010 ILLUSTRATING THE CHANGE IN THE LEVEL OF STAFFING.

D. PROVIDE A SUMMARY OF THE NUMBER OF PEPCO FIELD EMPLOYEES PER MILE OF ABOVE GROUND CIRCUIT, IDENTIFYING THE PERCENTAGE OF CONTRACT VS. UNION EMPLOYEES.

RESPONSE

A.

A. There are 1,275 Pepco employees and contractors assigned to ongoing operations and restoration efforts. There are 135 Pepco employees and contractors assigned to Customer Service activities in the Pepco Maryland Region.

B. Of the 1,275 Pepco employees assigned a role related to ongoing operations and restoration efforts, 816 are union and 349 are non-union, and 110 are contractors. Of the 135 employees assigned a role in customer service activities, 73 are union, 12, are non-union, and 50 are contractors.

C. The requested calculation has not been performed.

D. The requested calculation has not been performed.

SPONSOR: George P. Nelson

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MC OCP DATA REQUEST NO. 4

QUESTION NO. 7

Q. PLEASE DESCRIBE PEPCO'S OUTAGE MANAGEMENT SYSTEM IN DETAIL, INCLUDING THE FOLLOWING:

A. HOW THE SYSTEM GUIDES THE DEPLOYMENT OF PEPCO RESOURCES?

B. WHAT FACTORS INFLUENCE THE DECISION TO DEPLOY RESOURCES IN DIFFERENT WAYS (E.G., NUMBER OF CUSTOMERS AFFECTED, VULNERABLE COMMUNITIES?)

C. OUTLINE HOW VULNERABLE COMMUNITIES ARE CLASSIFIED AND HOW THEIR NEEDS ARE ADDRESSED?

D. DESCRIBE ANY PERFORMANCE TARGETS EMBEDDED IN THE OUTAGE MANAGEMENT SYSTEM AND HOW ACHIEVEMENTS OF THESE TARGETS ARE MEASURED?

E. PROVIDE AFTER ACTION REPORTS ILLUSTRATING HOW THE OUTAGE PERFORMED IN EACH OF THE FOUR MAJOR EVENTS IN 2010, SPECIFICALLY HIGHLIGHTING ANY PERFORMANCE GOALS, THE MEASUREMENT OF PERFORMANCE, SUGGESTED CHANGES TO IMPROVE PERFORMANCE, AND IF THESE CHANGES IMPROVED PERFORMANCE IN SUBSEQUENT EVENTS.

RESPONSE:

A. A. Pepco's Outage Management System (OMS) is a proprietary vendor product from an industry leading software company. Capabilities within OMS include predicting the failed device that caused an outage(s). Pepco staff use the outage information in the OMS system (both predicted device and outage information reported by the customer) and input from employees in the field (patrollers, line mechanics), to understand the extent of the damage and develop a resource deployment strategy and ultimately determine restoration times.

B. The Pepco restoration process and priorities are outlined in the Incident Response Plan (IRP), Attachment No. 5-1 provided in response to Order No. 83552. Pepco follows triage and prioritization methods that are generally consistent with industry practice. These processes are focused on restoring the maximum number of customers in the shortest period of time while simultaneously meeting community priorities of addressing imminent and critical safety concerns and restoration of critical community infrastructure. As outlined in the plan, prioritization cascades from first addressing the critical life threatening safety needs (assist fire and police requests) to restoration of the bulk transmission and subtransmission

systems, restoration of distribution feeders, local damage vicinities on distribution feeders, followed by restoration of individual customers.

C. Prioritization within the distribution system is accomplished through use of a "weighted customers count" method. This was developed as an outcome of the Witt Report prepared after Hurricane Isabel. This weighted method is used to account for the fact that on an individual basis certain facilities take differing community urgency in restoration. For example, two outages, one involves a single residence, one involves a hospital. The hospital has a higher weight than a residence and would be dispatched prior to the residence. To assist dispatchers and relieve them of the need to remember which feeders have hospitals, sewage plants, etc., OMS will indicate the cumulative weighted count for all priority customers on any given feeder. Therefore a feeder with a hospital will indicate that more customers are out of power than one with just residences and will be dispatched first.

D. Each storm is different and, as such, the system does not have any embedded performance targets. During and after the event, metrics are evaluated to determine if there are issues with areas such as call processing, SCADA event processing and user response time. During the storms of 2010, no problems were identified in these areas.

E. The storm reports provided to the Commission are considered the after actions reports. Specific areas for improvements have been identified in the reports and the status of these improvements has been reported to the Commissions as part of other data requests.

SPONSOR: George P. Nelson

QUESTION NO. 9

Q. PLEASE SUMMARIZE PEPCO'S EFFORTS SINCE THE 2010 WINTER STORMS TO IMPROVE CUSTOMER RELATIONS EFFORTS. SPECIFICALLY:

A. DESCRIBE ANY CHANGES TO STAFFING PROCEDURES OR LEVELS IN RESPONSE TO THESE EVENTS, WITH EMPHASIS ON HOW THE EFFECTIVENESS OF THESE CHANGES WOULD BE MEASURED? WHAT ARE THE INTERIM RESULTS OF THESE MEASUREMENTS?

B. ADDITIONAL STAFF TASKED TO FACILITATE COMMUNICATION WITH PARTNERSHIPS. PLEASE PROVIDE A LIST OF STAFF AND THE NUMBER OF PARTNERSHIPS THEY OVERSEE.

RESPONSE:

A. A&B **Customer Service**

Additional internal CSRs are in the process of being hired. A class of 15 CSRs began training at Pepco's outsourcers' training facility on January 31 and an internal class of 18 CSRs will begin training on February 28. In addition, 20 internal CSRs are scheduled to start in April.

The effectiveness of these changes will be measured by improvements to customer feedback.

Community/Government Relations

Since the 2010 Winter Storm Event, Pepco has worked to respond to the issue(s) raised by community and government stakeholders concerning the reliability of the Company's electric distribution system. In August of 2010, Pepco formally released its Reliability Enhancement Plan for Maryland to community and government stakeholder. This information was disseminated through community meetings, postings on the Company's website, briefings with government officials and government agency representatives, correspondence, fact sheets and press releases.

The Company's work schedule to implement the Reliability Enhancement is posted on its website and updates are provided concerning its progress. Pepco customers receive direct mailings concerning activities that are scheduled to take place in their communities. The posted work schedule, identifies the Company's proposed activities and the progress reports, delineating the Company's progress as it relates to these initiatives. This assists the community, at large, in tracking the Company's progress on these initiatives.

External to briefings with state and county elected officials, Pepco ha conducted over thirty-six (36) community meetings, since August of 201(addressing the issue of electric system reliability enhancements i Montgomery County and Prince George's County.

Staffing levels have not changed and outreach and engagement continue to be executed primarily by members of the Company's Speaker's Bureau which is a part of the External Affairs Division of the Corporation.

SPONSOR: Charles R. Dickerson/Thomas H. Graham

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
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QUESTION NO. 13

Q. FOR NON-MAJOR OUTAGES, IDENTIFY THE 2% OR 10 WORST PERFORMING CIRCUITS IN THE PEPCO MARYLAND, TERRITORY. PLEASE PROVIDE THE FOLLOWING SPECIFIC INFORMATION RELATIVE TO THESE CIRCUITS:

A. LOCATION AND IDENTIFIER OF THE 2% WORST CIRCUITS, CLEARLY DELINEATING WHICH ARE WITHIN OR AFFECT MONTGOMERY COUNTY.

B. NUMBER OF OUTAGES PER FEEDER AND THE ROOT CAUSE FOR 2005 TO 2010.

C. PEPCO'S PLAN FOR SPECIFICALLY IMPROVING THESE UNDERPERFORMING CIRCUITS.

D. SAIFI AND CAIDI DATA ITEMIZED PER CIRCUIT.

E. SPECIFIC MEASURES THAT WERE TAKEN BETWEEN 2005 AND 2010 TO IMPROVE THESE CIRCUITS FOR EACH CIRCUIT.

F. HOW PERFORMANCE OF THESE CIRCUITS IS MEASURED, HOW IMPROVEMENTS WERE TAKEN INTO ACCOUNT, AND WHAT THE ACTUAL IMPROVEMENT PER CIRCUIT WAS.

G. DESIGN CAPACITY, AVERAGE LOAD, AND PEAK SUMMER LOAD FOR 2008, 2009, AND 2010 PER CIRCUIT.

H. AGE OF WIRE, CABLE AND TRANSFORMERS ITEMIZED PER CIRCUIT.

I. WHAT IS THE AVERAGE AGE OF TRANSFORMERS ON EACH OF THESE CIRCUITS, WHAT TRANSFORMERS WERE REPLACED PER CIRCUIT BETWEEN 2005 AND 2010?

PEPCO'S RESPONSE: February 15, 2011

A. Note that for least performing feeder data, for each year referenced, the data are based on a performance period that overlaps previous two years. For example, for the 2010 Least Performing Feeders, the data feeders were based on 2009 performance for the period of October 1, 2008 through September 30, 2009.

A. Refer to the response provided to Order No. 83552, Question No. 19.

B. Number of outage events per feeder and causes are provided in the Attachment Nos. 1-4. Refer to the yearly spreadsheet and the corresponding feeder tab for such information. Pepco started tracking causes from year 2007. There are no files available for year 2005 and 2006.

C. Pepco's plan for improving the results of each each feeder is submitted to the Commission annually and is available on the Commission's website.

D. See Attachment No. 5.

E. Refer to the response to part (c). The reports provided include both the corrective action plan for the current year and the completion results for the previous year's feeders.

F. Refer to the response to item (c). The performance of these circuits is measured by SAIFI and SAIDI (along with CPI for ranking priority feeders). The improvements/remediations were stipulated in Section C (7) and C (8) of the annual report. The actual improvement (or sometimes deterioration) is also provided in this section (see - table (5) under section C (8)).

G. Feeder capacities and peak loads for 2008, 2009, and 2010 are provided in Attachment No. 6. Average feeder loads are not tracked at Pepco.

H. The requested information is not available

I. The requested information is not available.

FOLLOW-UP REQUEST: March 8, 2011

Q. PLEASE PROVIDE A LIST OF FEEDERS THAT HAVE BEEN IDENTIFIED AS PRIORITIES FOR IMPROVEMENT IN 2011. FOR EACH FEEDER, IDENTIFY IF THESE FUNDS ARE CONTINGENT UPON APPROVAL OF THE PEPCO RELIABILITY PLAN.

PEPCO PROVIDED OUTAGE INFORMATION FOR NON-MAJOR EVENTS FOR FEEDERS THROUGH SEPTEMBER 30, 2009 AS PART OF REFER TO THE RESPONSE PROVIDED TO ORDER NO. 83552 ATTACHMENT NOS. 1-4. PLEASE PROVIDE THE "MAJOR OUTAGE CAUSE SUMMARY" FOR THE PERIOD OCTOBER 1, 2009 THROUGH SEPTEMBER 30, 2010.

RECEIVED CLARIFICATION. QUESTION WAS REVISED TO THE FOLLOWING

PLEASE DESCRIBE PEPCO'S UPGRADE PLANS FOR IMPROVEMENTS TO PRIORITY FEEDERS:

A. PLEASE PROVIDE UPDATED INFORMATION FOR NON-MAJOR EVENT FEEDER OUTAGES THROUGH SEPTEMBER 30, 2010? IDENTIFY ANY FEEDERS THAT ARE SCHEDULED FOR UPGRADE AS PART OF PEPCO'S RELIABILITY ENHANCEMENT PLAN.

B. IDENTIFY SPECIFIC FEEDERS AND THE COMMUNITIES THEY SERVE THAT HAVE BEEN IDENTIFIED AS PRIORITIES FOR

IMPROVEMENT IN 2011 AND NOTE IF THESE IMPROVEMENTS ARE CONTINGENT UPON APPROVAL OF PEPCO'S RELIABILITY ENHANCEMENT PLAN?

PEPCO'S FOLLOW-UP RESPONSE: March 22, 2011

A. A. The 2011 priority feeders for Montgomery County and the major outage cause information are provided in the attached. All 2011 priority feeders have upgrade work identified in the Reliability Enhancement Plan. Note: the 2011 priority feeders list was developed base on 2010 feeder performance during the period October 1, 2009 through September 30, 2010.

B. Information on the specific feeders and the area/general location where improvement work is planned can be found in the Reliability Enhancement Plan Work Plan for Montgomery County that is posted on the Pepco internet. None of the work identified in the Reliability Enhancement is contingent upon Commission approval

SPONSOR: Michael W. Maxwell

POTOMAC ELECTRIC POWER COMPANY
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QUESTION NO. 17

Q. PROVIDE A SUMMARY OF TRANSFORMERS IN THE PEPCO MARYLAND REGION SYSTEM, EXPANDING UPON INFORMATION PROVIDED IN THE FIRST DATA REQUEST. SPECIFICALLY:

A. HOW MANY TRANSFORMERS ARE IN THE PEPCO REGION SYSTEM?
B. HOW MANY TRANSFORMERS HAVE BEEN REPLACED BETWEEN 2005 AND 2010?
C. WHAT IS THE AVERAGE AGE OF A TRANSFORMER?
D. DOES PEPCO FOLLOW AN INDUSTRY BEST PRACTICE WITH REGARD TO THE MAXIMUM AGE OF A TRANSFORMER?
E. DOES PEPCO HAVE A STANDARD REPLACEMENT INTERVAL, PREVENTATIVE MAINTENANCE PROCEDURE FOR TRANSFORMERS? PLEASE PROVIDE THIS PROCEDURE AND DESCRIBE HOW PERFORMANCE IS MEASURED. FOR A SAMPLE CIRCUIT, PROVIDE A SUMMARY OF THESE MEASUREMENTS AND HOW THEY HAVE IMPROVED BETWEEN 2005 AND 2010.

RESPONSE:

A. A. There are 88,459 distribution transformers in the Pepco system (44,735 – MC; 30,690 – PG; 13,034 – DC).
B. There have been a total of 3468 (1456 – DC; 2012 – MD) distribution transformers replaced between 2005 and 2010.
C. The average age of a distribution transformer on the Pepco system is not known.
D. Pepco follows the industry practice with regards to the maximum age of a distribution transformer. Transformer age is not an strong indicator of potential failure. Industry best practices do NOT replace transformers when they reach a certain age. Transformer replacements are driven by performance. The primary factor is internal heating due to loading.
E. Pepco does have a preventative maintenance procedure for padmount equipment and network transformers as filed with the MD Public Service Commissiont in accordance with the requirements of the Title 20, Section 20.50.02.04 of the Code of Maryland Regulations (COMAR)
As filed, Pepco will inspect:

Padmount equipment, including transformers, every 10 to 20 years. The routine inspection consists of the following activities to ensure the padmount equipment is:

- § Properly locked, not leaning
- § Free of penetrating rust
- § Clear of vegetation
- § Properly labeled and adequately painted

Network transformers and protectors are inspected and tested in the field on a predetermined time-interval basis. More infomation can be found by referring to the Operating and Maintenance program provided in response Order No. 83552, Question No. 3 Order No. 83552.

There is no standard preventive maintenance procedure for pole type distribution transformers. They are inspected based on performance as part of the 2% priority feeder, CEMI (Customers Experiencing Multiple Interruptions), customer voltage complaints and outage follow-up programs.

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Padmount equipment, including transformers, every 10 to 20 years. The routine inspection consists of the following activities to ensure the padmount equipment is:

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SPONSOR: Michael W. Maxwell

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MC OCP DATA REQUEST NO. 4

QUESTION NO. 18

Q. HOW MANY MILES OF UNDERGROUND WIRE ARE INSTALLED IN RESIDENTIAL NEIGHBORHOODS IN PEPCO MARYLAND? IN ADDITION, PLEASE PROVIDE THE FOLLOWING:

A. WITHIN RESIDENTIAL NEIGHBORHOODS, HOW MANY MILES OF WIRE ARE OVER 30 YEARS OLD IN AGE? HOW MUCH IS IN MONTGOMERY COUNTY?
B. PLEASE PROVIDE PEPCO'S PROCEDURES AND PLANS TO IDENTIFY UNDERGROUND CABLE AND EQUIPMENT IN RESIDENTIAL NEIGHBORHOODS?
C. FOR THE 2% OR 10 WORST PERFORMING CIRCUITS, PLEASE PROVIDE AN ITEMIZED LIST INDICATING THE AGE OF THE UNDERGROUND CABLE PER CIRCUIT, ANY REPLACEMENTS OF CABLE BETWEEN 2005 AND 2010 AND ANY PLANS TO REPLACE CABLE BETWEEN 2011 AND 2015.

RESPONSE:

A. Based on the GIS data, there is approximately 5,100 miles of primary URD cable in the Pepco Maryland service territory.
   a. Assuming that the question pertains to URD cable vs. "wire" as noted in the question, approximately 1,200 miles of URD cable throughout the entire Pepco service territory are over 30 years old. The requested information is not available by jurisdiction.
   b. Identification of areas for replacement or upgrade of URD cable is based on the number of cable faults and equipment failures within the 2 year period as well as the number of customers affected.
   c. The information regarding the age of underground cable per circuit is not currently available. Work completed as part of corrective action plans for the priority feeder circuits is documented in annual Reliability Indices Report that Pepco submits to the Commission. Filings for the requested years are available on the Commission website.

   Additional information pertaining to URD cable replacement and upgrade work can be found in the Reliability Enhancement Plan for Montgomery County that is available on the Pepco website at http://www.pepco.com/energy/reliability/mdplan/

SPONSOR: Michael W. Maxwell

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MC OCP DATA REQUEST NO. 4

QUESTION NO. 22

Q. WHAT CAPACITY DOES PEPCO HAVE FOR EVALUATING ISSUES SUCH AS SURGES AND VOLTAGE DROPS AT THE FEEDER LEVEL? SPECIFICALLY:

A. IF THESE FACTORS CANNOT BE EVALUATED, DOES PEPCO HAVE PLANS TO IMPROVE THEIR ABILITY TO EVALUATE THESE FACTORS?

B. DO ANY OF THE 2% OR 10 WORST PERFORMING FEEDERS IN MONTGOMERY COUNTY CHRONICALLY HAVE ISSUES WITH SURGE AND VOLTAGE DROPS, HOW IS THIS MEASURED AND WHAT EFFORTS HAVE BEEN TAKEN TO IMPROVE THESE FEEDERS. PLEASE ITEMIZE PER FEEDER.

RESPONSE:

A. A. Pepco evaluates feeder voltage drops on a two-year cycle. Pepco has recently upgraded to a three-phase power flow software package that calculates the circuit voltage to the primary of each of the customer transformers. Approximately half of the Maryland circuits have been studied using this software package. The rest will be studied using the upgraded software package over the next year.

Previously feeder voltage drops were examined for the feeder main line only. However, a conservative allowance was incorporated into the criteria to compensate for voltage drops on fused laterals.

B. Pepco examines the voltage profiles of the 2% worst performing circuits to determine whether low voltage contributed to the circuit problems. Four feeders that have appeared in the 2% Worst Performing Feeder list from 2005 to 2010 had modeled sustained voltage drops that exceeded Pepco criteria in the year they appeared on the list. The older two voltage drops have been corrected and the most recent two are to be corrected by summer 2011. These voltage problems are corrected using load transfers, capacitor installations, and voltage regulator installations.

SPONSOR: Michael W. Maxwell

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MC OCP DATA REQUEST NO. 4

QUESTION NO. 23

Q. WHAT PERCENTAGE OF LINES IN PEPCO MARYLAND REGION CURRENTLY HAVE LIGHTENING ARRESTORS INSTALLED, WHAT IS THE SERVICE LIFE OF THE ARRESTORS? WHAT IS THE FAILURE RATE?

RESPONSE:

A. 100% of lines in Pepco Maryland Region have lightning arrestors.
The average life of a lightning arrestor is 30 years.
The failure rate is unknown.

SPONSOR: Michael W. Maxwell

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MC OCP DATA REQUEST NO. 4

QUESTION NO. 24

Q. VEGETATION MANAGEMENT: PLEASE SUMMARIZE PEPCO'S POLICIES REGARDING VEGETATION MANAGEMENT, SPECIFICALLY PROVIDING:

A. PROVIDE SPECIFIC PROCEDURES FOR EXECUTING TRIMMING OPERATIONS AND DESCRIBE HOW THESE PROCEDURES HAVE CHANGED BETWEEN 2005 AND 2010 AND HOW YOU PLAN TO CHANGE THESE PROCEDURES AS A RESULT OF THE 2010 STORMS.

B. INDUSTRY BEST PRACTICES OR STANDARDS FOR TRIMMING THAT PEPCO HAS ADOPTED.

C. ANY BARRIERS THAT PEPCO HAS ENCOUNTERED AT THE LOCAL, STATE OR COMMUNITY LEVEL (COMMUNITY DEFINED AS A LOCAL HOME OWNERS ASSOCIATION, BUSINESS DISTRICT, CIVIC ASSOCIATION, DEVELOPMENT OR SUBDIVISIONS) THAT HAVE HINDERED IMPLEMENTATION OF INDUSTRY BEST PRACTICES?

RESPONSE:

A. A & C. In 2009 Pepco began its transition from a two-year cycle to a four-year cycle for electric clearance tree trimming. The tactic the Company plans to continue to implement is its Enhanced Integrated Vegetation Management (EIVM) program. EIVM includes as one of its components the four-year cycle aggressive electric clearance tree trimming. Refer to the response provided to Montgomery County Data Request No. 2-2 for an additional description of the EIVM program and challenges faced by the Company in eliminating the danger of off right of way trees that pose a threat to the reliability of the distribution system.

B. PHI follows the ANSI A300 pruning standard and associated best management practices, (BMP's)

SPONSOR: George P. Nelson

POTOMAC ELECTRIC POWER COMPANY
MARYLAND CASE NO. 9240
RESPONSE TO MC OCP DATA REQUEST NO. 6

QUESTION NO. 2

Q. PLEASE PROVIDE THE NUMBER OF PEPCO CUSTOMERS AT YEARS END FOR EACH YEAR FROM 2004-2010 SPECIFICALLY PROVIDE THE NUMBER OF BOTH RESIDENTIAL AND NON-RESIDENTIAL CUSTOMERS:

A. SYSTEM-WIDE
B. IN MARYLAND
C. IN MONTGOMERY COUNTY

RESPONSE:

A. See the attached.

SPONSOR:

POTOMAC ELECTRIC POWER COMPANY

Retail Customers at Year-End

2004 - 2010

System	2010	2009	2008	2007	2006	2005	2004
1. Residential	713,148	704,575	692,987	686,636	680,358	674,046	664,994
2. Commercial	73,782	73,630	73,446	73,331	73,436	72,989	71,802
3. Other	133	132	134	134	143	138	141
Retail Customers	787,063	778,337	766,567	760,101	753,937	747,173	736,937

Montgomery County	2010	2009	2008	2007	2006	2005	2004
1. Residential	280,945	278,686	275,947	274,652	272,927	270,595	267,919
2. Commercial	26,660	26,562	26,389	26,367	26,300	26,091	25,527
3. Other	61	61	61	60	63	64	65
Retail Customers	307,666	305,309	302,397	301,079	299,290	296,750	293,511

Maryland	2010	2009	2008	2007	2006	2005	2004
1. Residential	483,906	478,545	472,874	471,466	469,138	465,722	461,458
2. Commercial	47,348	47,231	46,767	46,701	46,699	46,300	45,411
3. Other	100	100	102	101	112	107	109
Retail Customers	531,354	525,876	519,743	518,268	515,949	512,129	506,978

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APPENDIX H – Bibliography

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APPENDIX I – Complete List of Recommendations

RECOMMENDATIONS TO PEPCO

1. ***The Work Group supports the PSC Consultants' Report observations and recommendation (B1) that Pepco implement a rigorous, systematic, and long-term infrastructure inspection and maintenance program.***
   The program should include a complete assessment of the Pepco system, completed in no more than the next four years. The cycle should be repeated every four years thereafter to ensure continued and acceptable system reliability[132].

2. ***Pepco should institute a comprehensive process for collecting and maintaining records, and, at the discretion of the PSC, implement auditing of records by a third party auditor.***

   Pepco has a systemic deficiency in collecting and maintaining adequate records, both financial and operational, to monitor asset conditions, performance, and plans for replacement for much of its infrastructure.

3. ***Pepco should modify its O&M program from a reactive orientation to a proactive orientation that includes periodic inspection, measurement and reporting on equipment conditions, repairs made, and costs.***

   This process should be comprehensive and periodically reviewed by the PSC or a qualified third party and identified should be implemented.

4. ***Pepco should further investigate records of incidents of substation failure in its Quince Orchard and Kensington substations to assess whether improved maintenance protocols and practices could have prevented the failures.***

   An investigation of the cause of the Kensington Substation failure was traced to a failure in the battery system. Pepco, as quoted in the media, stated that "the age and condition of the battery could have played a role in the failure"[133]. A comprehensive maintenance and inspection program might have identified and prevented this system failure.

5. ***Pepco should conduct a transparent analysis for selective undergrounding to include the weighting associated with corresponding feeders and transformers, relative SAIFI for corresponding feeders and transformers and presence of factors whose impact is likely to be affected by undergrounding (e.g., Urban Tree Canopy).***

[132] First Quartile and Silverpoint Report to the PSC, Page 57.
[133] Kadylak, J. (March 28, 2011) Kensington Substation Fire Caused by Battery System Failure. *Kensington Patch*. Retrieved from http://kensington.patch.com/articles/kensington-substation-fire-caused-by-battery-system-failure.

Despite repeated references to the need and effectiveness of selective undergrounding, Pepco has not implemented a single new project to harden vulnerable circuits in this manner and to test the effectiveness of this procedure.

6. ***Pepco should systematically evaluate all feeders and take appropriate corrective action to fix troubled feeders on a specific schedule and advise the PSC accordingly. Pepco and the PSC should develop a new standard that identifies a greater number of the worst performing feeders to be addressed as priorities.***

   When feeders appear on the worst performance list more than once in a five year period, which is currently not uncommon for Pepco, the firm should take immediate action. Pepco should report performance data on that feeder for each of the next five years to ensure effectiveness of the prescribed corrective action.

7. ***Pepco should establish a revised approach to underground cable replacement that focuses on assessment and evaluation rather than reactive, breakdown repair or replacement***

   Pepco's staff states that URD is scheduled for replacement based on the number of failures and complaints, with no evidence of proactive testing, or a scheduled replacement interval.

8. ***Pepco should establish an ongoing program to conduct analyses of customer outage reports and other data as it becomes available, such as through AMI, to identify clusters that indicate local problems may exist—and then take prompt corrective action.***

   BGE has stated that a part of its reliability approach is to monitor system performance and identify areas or circuits that have chronic or recurrent problems. Pepco should implement a similar surveillance program.

9. ***Pepco should accelerate and sustain investment in equipment for better monitoring, control, and operations of the distribution system beyond the initial five- year period covered by the Reliability Enhancement Plan for the purpose of achieving a high level of long-term system reliability.***

   Pepco's current Reliability Enhancement Plan proposes a number of actions, that at face value would appear to be effective and in the right circumstances can in fact be remedies for some distribution system reliability problems. However, these remedies have neither been vetted for their performance nor do benchmarks appear to have been established to monitor their overall effectiveness.

10. ***The Work Group supports the PSC Consultants' Report conclusion that Pepco should immediately comply with existing NESC standards for regular inspection and follow-***

up maintenance of sub-transmission and distribution lines in compliance with COMAR regulations[134].

Pepco acknowledges that this approach does not capture all potential issues or fully comply with NESC standards, and it is not opposed to establishing a more robust feeder inspection program[135]. Pepco should follow-up on this recommendation.

11. ***Pepco should consider initially implementing AMI technology in areas with weighted critical facilities (more rapidly within the context of its current implementation program).***

    The Working Group acknowledges that there are some logistical limitations that may affect how AMI meters are rolled out into the Community (e.g., meter density, collector location). However, Pepco has stated that it intends to deploy AMI by "following the circuit", over a multi-year period. To help enhance reliability in the short term, Pepco should install AMI in communities with critical facilities to the extent practicable. Simply stated, the customers' convenience should outweigh Pepco's convenience except when sound reasons to the contrary exist.

12. ***Pepco should integrate its Outage Management System (OMS), customer communication and AMI technology to provide customers information about outages.***

    AMI can be a powerful tool to streamline utility operations, introduce new tariff structures, and reduce costs from meter reading. However, unless it is integrated the Outage Management System in an effective and meaningful way it can neither provide data to accelerate restoration of outages nor contribute to post incident analyses.

13. ***Pepco should develop a vegetation management program, including metrics that demonstrate efficacy and cost effectiveness of its program. Further, program status should be reported annually to the PSC.***

    Pepco's current Reliability Enhancement Program provides no ability to measure success of its current efforts, nor does it provide for any routine reporting to the PSC on cost effectiveness.

14. ***Pepco should periodically review plans for staging personnel and resources associated with responding to Major Event outages.***

    Pepco has indicated to the Work Group that the staging plan has little opportunity for improvement. The plan uses Pepco facilities on Gude Drive, the Montgomery County Fair Grounds, and the Rockville Campus of Montgomery College as its principal staging areas in the County. The Work Group was informed by County staff that offers have been made without effect to assist Pepco with repositioning assets for Major Events in order to improve response times (Figure 27). The Work Group believes a search for alternatives is worth pursuing.

[134] First Quartile and Silverpoint Report to the PSC, Page 51.
[135] First Quartile and Silverpoint Report to the PSC, Page 51.

15. Pepco should factor in the amount of time a customer has been without power when updating restoration priorities.

The Work Group learned that BGE adds a new restoration priority into its response algorithm that also factors in the amount of time a customer has been without power. In this way, customers who have suffered the longest can be moved real-time to a higher priority position for restoration. This would be especially important during prolonged outages in inclement weather.

16. Pepco should modify its customer information system to include the capability to provide a complaint reference number for tracking purposes. The utility should also provide additional training to customer service representatives on being courteous and getting accurate information to customers even under stressful conditions. The Work Group also supports the PSC Consultants' Report recommendation (VIII-6) that Pepco establish more frequent outage communications refresher training.

The complaint reference number, along with the identity of those who assisted the customer and the information provided or action taken or both, should be preserved electronically by Pepco and updated each time the customer calls about the same problem.

All customer service representatives and "second-role" employees who handle customer calls during emergency events should be trained and familiar with key outage-related information, as indicated in the PSC Consultants' Report.[136]

The Work Group supports the PSC Consultants' Report recommendation that Pepco should update its Contact Center storm plan.[137]

The Work Group supports the PSC Consultants' Report recommendation that Pepco implement a quality control process that includes specific call monitoring, sampling and scoring of all call answerers during outage events as a tool for quality improvement, feedback and consistency purposes.

17. In advance of forecasted storms, Pepco should ensure that its customer call center staff is augmented in order to respond to as many calls as possible with live customer service representatives

BGE routinely has 240 customer call-line personnel (80 for each 8 hour shift) available during normal operations[138]. For Major Events, BGE has 348 additional BGE personnel who typically perform other duties who have been trained and are able to supplement the 240 dedicated personnel. By comparison, Pepco has 135 employees and contractors assigned to customer service activities in the Pepco Maryland region.[139]

[136] First Quartile and Silverpoint Report to the PSC Page 119.
[137] First Quartile and Silverpoint Report to the PSC Page 119.
[138] January 25, 2011 meeting of the Work Group with BGE.
[139] MC Data Request 4, Q1A.

18. ***Pepco should create an ombudsman office to facilitate the resolution of customer complaints (related to outages, billing, or other matters). Pepco should provide, to the PSC, State and local governments, and the public, periodic reports (e.g., quarterly) containing a summary and description of the nature, number and resolution of customer complaints by this office.***

    The Work Group learned that some Pepco customers are simply unable to get their complaints resolved in a satisfactory and timely manner. An ombudsman, and additional transparency into the nature and quantity of Pepco's customer complaints, should help to accelerate the resolution of such enduring problem-cases. Similarly, PHI should establish an ombudsman to address chronic reports of inferior performance.

19. ***Pepco should improve its web-based communications, including ensuring the resiliency of its outage map, creating a means to report outages online, and ensuring that web-based resources are compatible with smart phones and other mobile devices.***

    The repeated failures of Pepco's online resources have been well-documented.

20. ***Pepco should prominently include on all customer bills an account-identifier number to assist those seeking to contact Pepco as well as Pepco itself in resolving problems.***

    Metered communities are unable to access the information Pepco provides on its automated systems because they do not have a unique account-identifier. The Work Group heard from numerous representatives of commonly metered customers that it was not easily possible to obtain information about outages in these communities.

21. ***Pepco should implement timely and accurate damage assessment protocols, as indicated in the PSC Consultants' Report, to ensure that more accurate ETRs are consistently provided to customers[140].***

    A key to successful customer relations efforts is to provide accurate and useful information. Customers who are informed that their outages may take days to repair, and who have confidence in the accuracy of that information, will be better able to adapt to their situations than those who are provided with inaccurate information or no information at all.

22. ***Pepco should provide to Montgomery County government and municipal governments timely notification regarding significant outages and planned activities that impact Montgomery County and municipal infrastructure.***

    While many utilities, including other electric utility companies servicing Montgomery County, have processes to notify government and use Geographic Information System (GIS) extensively, Pepco has not embraced proactive notification and instead relies on government and residents to access its website to gather further information after learning of an outage from other sources. Establishing proactive measures over the current

[140] First Quartile and Silverpoint Report to the PSC, Page 91.

reactive approach will decrease the impact of outages on Montgomery County and its residents.

Consistent with the PSC Consultants' Report recommendation, Pepco should implement a proactive, comprehensive, and clear communication of standardized, structured emergency operations status that includes the details of its outage preparation/mobilization, response, and restoration efforts[141].

23. Pepco should provide real-time GIS information to County government during Major Events.

Shortly after a significant event, Montgomery County begins making decisions to open shelters and on how best to deploy its resources. Without information identifying where the most affected areas are, Montgomery County is often required to spread resources equally and or centralize services into the middle of the County.

24. Pepco and Montgomery County government and municipalities working together should design and implement an effective after-action assessment program.

The establishment of a regular "lessons-learned" process can enhance the capability of both the County and Pepco to serve the community.

25. There should be a written process agreed upon by Montgomery County, municipalities and Pepco for updating and implementing the weighting system used in setting power restoration priorities.

Montgomery County, municipalities, and Pepco should develop a customer weighting system and a set of common definitions. The weighting system should be updated at least once every four years.

26. Pepco should share with EMG representatives the priority weightings of each substation and feeder.

The above information is important for determining the consequences of specific feeder outages. It is recommended for each substation and feeder that the following be provided: a substation or feeder identifier currently utilized by Pepco; the total weighted value; the number of each customer type serviced; and predictive modeling showing the approximate estimated time of restoration based on historical events for each feeder (e.g., Hurricane Isabel, July 25, 2010 severe weather event, February 5, 2010 snow storm, etc.).

27. Pepco and Montgomery County EMG members should develop a plan for tiered deployment of resources for timely response to critical road closure locations.

The best response to emergency conditions is a coordinated strategy and mutual exchange of technology-driven information. The strategy should establish priorities and sharing

[141] First Quartile and Silverpoint Report to the PSC, Page 118.

responsibility for intersections without power. The plan should also include the grouping of locations where trees are down.

28. ***Pepco should annually identify at least three of its employees who will participate in Montgomery County EMG training. These same, trained, employees should serve as EOC liaisons during Major Events.***

    Pepco needs to ensure there is a sufficient number of its liaisons to Montgomery County and that those liaisons have the appropriate training on how to work effectively during EOC activations.

29. ***Pepco should include Montgomery County EMG representatives in its emergency response exercises and drills.***

    At least annually, Pepco should include Montgomery County officials in one exercise to ensure Pepco is making realistic assumptions regarding the County's actions and priorities and that County representatives are familiar with limitations on Pepco's response capacity.

30. ***Pepco should be granted the authority to conduct essential vegetation management on private property. In cases where these activities are disputed, the Work Group recommends the establishment of an independent arbitrator to mediate conflicts in a timely manner.***

    Granting Pepco private property authority after appropriate review could increase the utility's ability to conduct vegetation management and enhance overhead electrical reliability. The establishment of an independent arbitrator would serve as an unbiased third party that could resolve the issues associated with private property rights and trees threatening the utility's electrical reliability. While any apparent infringement on private property is obviously distasteful to the individuals involved, so too is the lack of electric power to the community.

RECOMMENDATIONS TO GOVERNMENTS

1. ***The State of Maryland should require and financially support the hiring of sufficient PSC staff specifically educated and credentialed in the area of establishing requirements for outage management, evaluating performance and assigning consequences.***

   A utility that knows that its actions will be judged rigorously, but fairly, will be more likely to improve its performance than a utility that faces a regulatory staff insufficiently sized and resourced.

2. ***Pepco and Montgomery County government and municipalities working together should design and implement an effective after-action assessment program.***

The establishment of a regular "lessons-learned" process can enhance the capability of both the County and Pepco to serve the community.

3. ***The Montgomery County Department of Transportation should send Pepco Storm Operations Reports.***

   The Storm Operations Reports should be provided to Pepco's emergency manager and include notification of all likely significant storm events and the emergency response status to trigger Pepco's prompt response plans, crews and key staff coordination. These reports should also include a reference to Department of Transportation's new Website Storm Application Face Mapping (Road Closure Icons).

4. ***All incorporated municipalities should participate in EMG conference calls.***

   During previous Major Events, incorporated municipalities when acting independently have been unable to obtain information about Pepco's restoration priorities and ETRs.

5. ***There should be a written process agreed upon by Montgomery County, municipalities and Pepco for updating and implementing the weighting system used in setting power restoration priorities.***

   Montgomery County, municipalities, and Pepco should develop a customer weighting system and a set of common definitions. The weighting system should be updated at least once every four years.

6. ***Pepco and Montgomery County EMG members should develop a plan for tiered deployment of resources for timely response to critical road closure locations.***

   The best response to emergency conditions is a coordinated strategy and mutual exchange of technology-driven information. The strategy should establish priorities and sharing responsibility for intersections without power. The plan should also include the grouping of locations where trees are down.

RECOMMENDATIONS TO PSC

1. ***The PSC should ensure that infrastructure shared between utilities (e.g., electricity, cable, telecom) is maintained to a comparable standard as non-shared equipment.***
   Approximately 10 percent of Pepco's 13 kV lines, some of the most vulnerable in terms of span and operations, are carried on poles owned by telecom companies. The PSC Consultants' Report concluded that while Pepco inspects poles every 12 to 18 years, the newest inspection tag noted on a telecom pole was 20 years old[142].

2. ***The PSC should implement a formal process to either validate or reject safety, reliability, and Major Storm Reports submitted by utilities.***

[142] First Quartile and Silverpoint Report to the PSC, Page 52.

It is the Work Group's understanding that currently the PSC receives Major Storm reports from utilities and performs an internal review of each, but does not validate the data contained in the reports. The PSC should provide substantive feedback to utilities on their submissions.

3. ***The PSC should require that utilities under its jurisdiction provide additional data in Major Storm Reports, including outage causes by county, much finer definitions of outage cause categories, and a chronology of requested and provided mutual aid assets.***

   Current Major Storm reporting categories are too few, need to be more specific, and should be common across all utilities, at least in any one state. The Work Group views it to be important that the PSC establish common definitions for each category and that the process for choosing a specific category be consistent across relevant utilities.

4. ***The PSC should establish a reliability standard that is directly related to customer relations efforts, and establish penalties associated with non-compliance. This standard should include:***

   - Numbers of calls during a major outage that were satisfactorily responded to within a set period of time. This standard should include criteria that will maximize the number of calls that are responded to by live customer service representatives as well as criteria that evaluate the accuracy of restoration times and other information that is provided to customers;

   - Degree of compliance with a PSC-approved storm communications plan which addresses staffing levels and training for customer service representatives;

   - Adequacy and accuracy of web-based communication;

   - Accuracy of all information provided to customers, including information to the media and to government officials.

5. ***The PSC should review and ensure publication of Pepco's and PHI's ombudsmen reports.***

   The ombudsman report should include a summary and description of the nature, number and resolution of customer complaints. It is the Work Group's position that the adequacy of customer call efforts should not be based solely on how quickly a call is answered, but also on the quality and accuracy of the information exchanged between the customer and the utility. Similarly, it believes that particularly egregious cases should be brought to the attention of senior management above the level of Pepco itself.

6. ***Expenditures for outage management should bear a reasonable correspondence to a benefit-cost ratio that reflects the value customers place on outage avoidance and the costs needed to comply with Commission requirements.***

The PSC should determine periodically the approximate dollar value that customers would be willing to pay for various levels of service reliability through open, transparent community inquiry.

Pepco should be directed, and other stakeholders invited, to present to the Commission its own proposed determinations for how much various levels of service reliability should cost, including projections for the costs of compliance with any Commission requirements. The Commission should issue guidelines, after receiving comments from interested parties, for addressing the data and analytical techniques necessary to support these determinations.

Furthermore, each utility should be required to submit annually to the Commission a report comparing the costs incurred by ratepayers for outage management to these established customer values. This report should describe the main cost drivers for outage avoidance and outage mitigation, and the main benefits derived from these cost drivers.

In the end, it is the customer who ultimately pays the costs of outages, reliability enhancements and regulatory practices.

7. ***The PSC should establish clear expectations regarding utility financial consequences for foregone revenues from reduced sales, and other financial consequences, arising from imprudent performance.***

   Those expectations should reflect two main principles. First, customers should pay for service received, but not for service they do not receive, when the service not received is attributable to utility imprudence. Second, the Company should be financially motivated, by remedies the Commission has authority to impose, to take all prudent actions necessary to avoid and mitigate outages. These principles translate into a set of responsibilities for ratepayers, utility companies, the PSC, and the General Assembly (Figure 33).

8. ***Utility revenue losses associated with an outage should be the utility's losses to the extent the losses are attributable to poor judgment or mismanagement, including failure to meet PSC standards.***

   The Commission will need to adjust its prior BSA decision for this purpose; otherwise ratepayers would be responsible for revenue losses attributable to imprudence.

9. ***A penalty for non-compliance with PSC standards should be established to align the utility's self-interest with the public interest.***

   A penalty for non-compliance with Commission standards is appropriate, even where the utility incurs revenue losses connected with outage imprudence.

10. ***The PSC should make a decoupling adjustment promptly, particularly since its original approval of the BSA in 2007 was based on an incorrect premise – that the company was providing reliable service to its customers – a premise proven wrong by the company's outage performance since that time.***

The Commission should also recognize that adjusting the BSA, by itself, only prevents the Company from being financially indifferent to outages; it does not substitute for a full set of standards and penalties or other remedies that will induce the Company to align its self-interest with the public interest and improve its performance.

11. The individuals making staff recommendations to the PSC should have relevant expertise levels at least equal to that of utility companies' staffs.

The Commission should determine, by surveying other regulatory agencies and utilities, the professional requirements for internal staff that will assure the knowledge, credentials, experience, size and credibility to accurately judge utility outage performance. The Commission should have an available supply of staff members who are experts in the full set of outage issues because Commission evaluation of outage preparedness and outage management is a continuing responsibility. When unique, technical issues arise, there must be access to consultants with unique technical experience and the financial means to retain them.

12. Once the PSC finds that an outage has resulted from a failure to meet the established standards, it should determine the extent to which utility mismanagement or poor judgment contributed to the failure.

The Commission should set standards by rule, penalties, and other remedies. Commission action should be based on the extent of utility culpability.

13. Any financial consequences imposed by the PSC should be sufficient to eliminate any utility tendency to cut necessary expenses in order to increase profits.

The Commission should have discretion to establish penalties and other remedies. The principle for establishing the penalty size should bear some connection to the costs that a prudent utility would incur to meet the standards. If a remedy is of a financial nature it too should relate to the cost that the utility would incur to meet the standards. That is, the penalty or remedy should be sufficiently large that it eliminates the increment of profitability associated with inappropriate cost-cutting.

14. The amount of any penalty or remedy imposed by the PSC should vary with the degree of imprudence, the severity of the effects on the public, and the nature of the non-compliance.

When the imprudence is more egregious, the penalty, or remedy if of a financial nature, should be larger. Economic consequences should rise with repeated acts of non-compliance with Commission standards. Further, economic consequences should not be recoverable from customers nor be returned to the utility to spend on meeting the Commission's standards.

15. The PSC should consider using all or a portion of penalty or remedy proceeds to provide customer refunds, perhaps in proportion to their usage or to the duration of the outages they experienced.

The Commission should balance equity to customers (both residential and commercial) who have experienced losses (both financial and economic) and administrative practicality when deciding how to distribute penalty or remedy proceeds.

16. ***The PSC should establish, well in advance of any crisis or urgency, the procedures by which it would implement these recommendations and the likely circumstances under which it would do so.***

    The Commission should create a time table and formal process for implementing these recommendations.

17. ***There should be no conflict between earnings and outage performance.***

    The Commission should require Pepco to present its plan for outage-related compensation, including how it impacts all executive employees, and report annually on its effects.

18. ***The PSC should evaluate the penalties, remedies and incentives utilized by other states to arrive at a mechanism that is equitable and feasible.***

    The Commission should direct its staff to conduct a survey of state regulatory commissions to build a database of best practices as a basis for decision making.

19. ***The PSC should make clear that compliance with its reliability standards, while insulating a utility from penalties or other remedies associated with non-compliance, does not insulate it from other remedies for imprudence under the PSC's authority such as disallowances in rate cases.***

    A utility can comply with all the rules, all the performance expectations, but still be imprudent: by, for example, spending too much money on compliance, over-using outside contractors for short-term benefit while failing to build a long-term competent staff (or the opposite, i.e., under-using outside contractors in favor of maintaining too large a staff).

20. ***A utility should not be able to use "financial weakness" as a shield against the consequences of its imprudence. If the PSC detects a pattern of deficient outage performance that puts ratepayers in a position of having to protect a company from its own imprudence, the Commission should initiate lawful procedures to find a replacement for the utility.***

    While the Work Group is hopeful that the PSC can induce all utilities to meet acceptable performance standards, this course of action (i.e., replacement) should still be available (Appendix F).