**PUBLIC**

**BEFORE THE**

**MARYLAND PUBLIC SERVICE COMMISSION**

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| IN THE MATTER OF THE APPLICATION OF POTOMAC ELECTRIC POWER COMPANY AND DELMARVA POWER & LIGHT COMPANY FOR A DETERMINATION OF NEED UNDER A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE MID-ATLANTIC POWER PATHWAY PROJECT IN MARYLAND AND THE CONSTRUCTION OF AN EXTRA HIGH VOLTAGE TRANSMISSION LINE FROM CALVERT COUNTY, MARYLAND TO THE WESTERN SHORE OF THE CHESAPEAKE BAY AND THE CONSTRUCTION OF AN EXTRA HIGH VOLTAGE TRANSMISSION LINE FROM THE MARYLAND EASTERN SHORE OF THE CHESAPEAKE BAY TO A NEW SUBSTATION IN VIENNA MARYLAND AND TO THE MARYLAND STATE LINE BORDERING DELAWARE | ) | Case No. 9179 |
| and JOINTLY FILED IN: | ) | |
| IN THE MATTER OF THE APPLICATION OF POTOMAC ELECTRIC POWER COMPANY FOR MODIFICATION OF THE EXISTING CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE CONSTRUCTION OF A SECOND 500 KV OVERHEAD TRANSMISSION LINE DESIGNED TO CARRY VOLTAGES IN EXCESS OF 69,000 VOLTS, PORTIONS OF WHICH ARE TO BE LOCATED IN CHARLES COUNTY AND PRINCE GEORGE'S COUNTY, MARYLAND | ) | Case No. 6526 |
| And | ) | Case No. 6984 |
| IN THE MATTER OF THE JOINT APPLICATION OF BALTIMORE GAS AND ELECTRIC COMPANY AND POTOMAC ELECTRIC POWER COMPANY FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE CONSTRUCTION OF A 500 KV TRANSMISSION LINE ON SINGLE CIRCUIT STEEL STRUCTURES FROM CALVERT CLIFFS, MARYLAND NORTHWESTERNLY TO AND ACROSS THE PATUXENT RIVER NORTH OF BENEDICT TO CHALK POINT | ) | |

**Public Version**

**DIRECT TESTIMONY**

**AND EXHIBITS OF**

**PETER J. LANZALOTTA,**

**LANZALOTTA & ASSOCIATES LLC**

# On Behalf of the Maryland Office of People's Counsel

## December 4, 2009

**DIRECT TESTIMONY OF**

**PETER J. LANZALOTTA**

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, AFFILIATION AND BUSINESS ADDRESS.

A. Peter J. Lanzalotta, Lanzalotta & Associates LLC, 67 Royal Pointe Drive, Hilton Head Island, SC 29926.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I am a graduate of Rensselaer Polytechnic Institute, where I received a Bachelor of Science degree in Electric Power Engineering. In addition, I hold a Masters degree in Business Administration with a concentration in Finance from Loyola College in Baltimore.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. I am a Principal of Lanzalotta & Associates LLC, which was formed in January 2001. Prior to that, I was a partner of Whitfield Russell Associates, with which I had been associated since March 1982. My areas of expertise include electric utility system planning and operation, electric service reliability, cost of service, and utility rate design. I am a registered professional engineer in the states of Maryland and Connecticut. My prior professional experience is described in Exhibit PJL-1, which is attached hereto.

I have been involved with the planning, operation, and analysis of electric utility systems and with utility regulatory matters, including reliability-related matters, certification of new facilities, cost of service, cost allocation, and rate design, as an employee of and as a consultant to a number of privately- and publicly-owned electric utilities, regulatory agencies, developers, and electricity users over a period exceeding thirty years.

I have been involved in a number of projects focused on electric utility transmission and/or distribution system reliability. I have been engaged by various government offices and agencies in the states of Delaware, Maine, Maryland, New Jersey, and Pennsylvania, among others, to help address concerns related to electric service reliability.

Q. HAVE YOU GIVEN EXPERT TESTIMONY IN ANY JUDICIAL OR QUASI-JUDICIAL PROCEEDINGS?

A. Yes, I have presented expert testimony before the Federal Energy Regulatory Commission ("FERC") and before regulatory commissions and other judicial and legislative bodies in 22 states, the District of Columbia, and the Provinces of Alberta and Ontario, Canada. My clients have included utilities, regulatory agencies, ratepayer advocates, independent producers, industrial consumers, the federal government, and various city and state government agencies. The proceedings in which I have testified are listed in Exhibit PJL-2.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My testimony, on behalf of the Office of People's Counsel ("OPC") addresses the following issues:

(1) Is there a need for the MAPP transmission line project, and related substation facilities, as proposed by the Companies[1]?

(2) Is there a need for the modifications to transmission line segments proposed by the Companies in PSC Case Nos. 6526 and 6984?

(3) Are there potential alternatives to the facilities proposed by the Companies?

(4) Is the estimation of benefits included by the Companies in their Application[2] reasonable?

Q. ON WHAT INFORMATION IS YOUR TESTIMONY BASED?

A. In preparing my testimony I have reviewed the Companies' Application, the testimony of the Companies' expert witnesses, the general requisites of Section 7-207 of the Public Utility Companies Article of the Maryland Annotated Code, the Companies' responses to

[1] For purposes of this Testimony, the "Companies" means Potomac Electric Power Company, Delmarva Power & Light Company and Baltimore Gas and Electric Company

[2] For purposes of this Testimony, the "Application" means, collectively, the filing made by the Companies on February 25, 2009 with the Maryland Public Service Commission, and the Supplemental Testimony filed in July 2009.

interrogatories, PJM documents and information, and FERC documents. I participated by phone in a technical conference between PJM and Intervenors on September 25, 2009.

## II. CONCLUSIONS

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

A. Based on my review, I have concluded the following:

a. The Companies have yet to submit a siting filing or a CPCN application, which they state that they intend to file at some later, but unspecified, date for that portion of the MAPP Project which is to start at the Calvert Cliffs Substation and proceed east, underwater across the Chesapeake Bay to a new substation at Vienna, and then continue on to the east to the Delaware state line. Until the Companies submit such siting filing and application, there is information missing that is vital to determining whether the MAPP Project is actually the best choice for reinforcing the transmission system. Depending on the choices made in siting the line and in mitigating its impact, the MAPP Project could be much more expensive and take longer to construct than the Companies and PJM have estimated. It is premature to decide that MAPP is needed to the exclusion of other alternatives.

b. Based on the Companies' filings in this proceeding, there will be a need for some system reinforcement by 2014 or later. However, the immediacy of this need is called into question because recent economic changes that have reduced electricity consumption, and other relevant factors, have not adequately been incorporated into the planning that underlies the Companies' filing. The Companies' Supplemental filing, at the end of July 2009, which affirms this 2014 date was based on a load forecast as of the end of 2008. However, the general decrease in electric loads has continued, and has perhaps intensified, in 2009. The PJM study supporting the need for the MAPP project needs to be updated to reflect the most up-to-date information.

c. The studies of the economic benefits prepared by the Companies shows that projected costs from MAPP will be greater than the projected potential benefits. No separate estimates of benefits and costs were prepared for the individual segments of MAPP. If recent challenges to the socialization of high voltage transmission costs across all of PJM become policy, then the Companies' customers could see higher costs from MAPP than reflected in these studies.

d. Project cost for the MAPP Project should be considered, relative to the costs for alternative approaches to addressing reliability violations, when determining whether MAPP is needed.

## III. COMPANIES' PROPOSAL

Q. PLEASE DESCRIBE THE PROPOSED MID-ATLANTIC POWER PATHWAY ("MAPP") TRANSMISSION PROJECT.

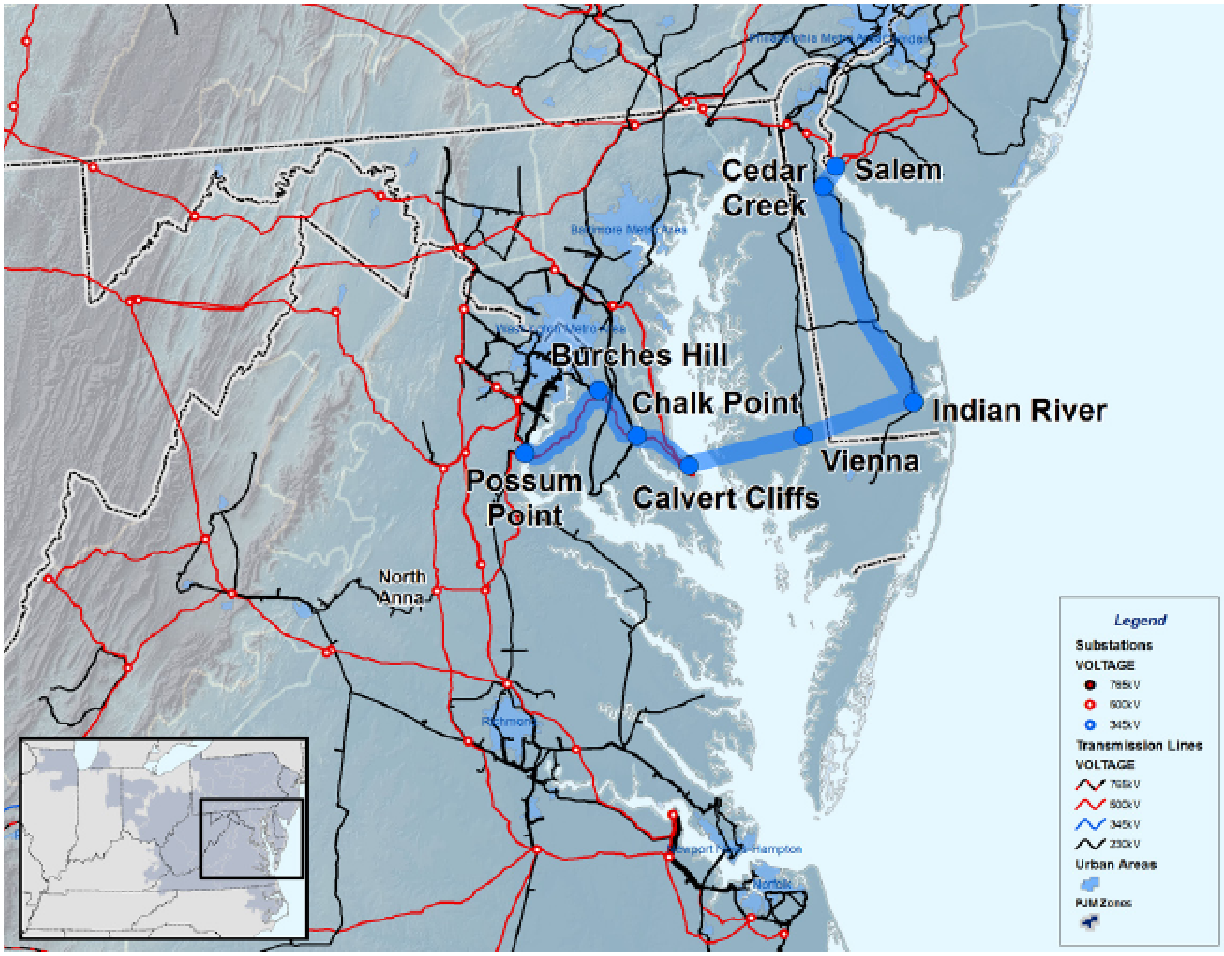
A. Figure 1 below is an excerpt from the PJM 2008 RTEP[3] which shows eastern Maryland, eastern Virginia, Delaware, southern Pennsylvania, and southern New Jersey, and which depicts an approximation of the proposed MAPP transmission line[4], and related segments. The proposed MAPP transmission line, and its related segments, are shown as a thick line that runs from Possum Point to Burches Hill to Chalk Point to Calvert Cliffs, across the Chesapeake Bay to Vienna and Indian River. The thick line between Indian River and Salem was once also part of MAPP, but has been deferred by PJM from current consideration, due mostly to reductions in peak load forecasts.

Figure 1

[3] "RTEP" refers to PJM Regional Transmission Expansion Plan

[4] In actuality, the proposed route of the transmission line may be different from that depicted in Figure 1.

**Map 5.5:** Possum Point - Salem 500 kV Transmission Line




The MAPP Line, as addressed in case No. 9179, starts from the Calvert Cliffs Substation and proceeds to the east, underwater across the Chesapeake Bay and then via a not-as-yet sited route to a new substation at Vienna, and then continues on to the east to the Delaware state line.

## IV. DETERMINATION OF NEED FOR THE MAPP PROJECT

Q. WHAT IS THE DIFFERENCE BETWEEN A DETERMINATION OF NEED AND A CPCN?

A. The Companies have requested a Determination of Need ("DON") under a Certificate of Public Convenience and Necessity ("CPCN") for the portion of the line starting at Calvert Cliffs substation and running east under the Chesapeake Bay and then overhead through Dorchester County to the Vienna substation, and continuing on to the Delaware state line. The DON does not address siting issues. Rather, the DON addresses issues such as the need to meet existing and future demand for electric service, and the reliability and stability of the electric system. The Companies will first have to file a request for the issuance of a CPCN along with the details of the siting of the proposed route and other information, in order to determine whether a CPCN should be granted.

As described by counsel for Pepco Holdings, Inc. ("PHI") in the March 4, 2009 Administrative Meeting[5]:

> **Mr. Boone**: "There will be a siting application for the Eastern Shore. We have it in the new proceeding that we are respectfully requesting is the needs determination of the overall MAPP project that supports the Chalk to Calvert rebuild, it supports the Potomac River crossing and the Western Shore portion if you will. We are working to finalize and determine the route through Dorchester County for the Eastern Shore. We have been working with the local government and citizens there – State and Federal. We would make the siting filing at a later

[5] A copy of the entire transcript as unofficially transcribed by the OPC is attached hereto as Exhibit PJL-3 (the "March 4 Transcript").

> date to complete that CPCN application, if you will, to get authority to build the line over to the Maryland-Delaware state line."

Accordingly, the DON would not address issues to be addressed in the siting filing.

Q. ARE THERE POTENTIAL PROBLEMS WITH TRYING TO MAKE A DETERMINATION OF NEED ("DON") PRIOR TO ADDRESSING SITING ISSUES FOR NEW HIGH VOLTAGE ELECTRIC TRANSMISSION LINES?

A. Yes, there are significant potential problems. To the extent that the Commission wants to have some degree of certainty that MAPP is feasible, and that MAPP is the best alternative from the standpoint of reasonable cost, then siting concerns need to be considered as part of considering a DON. The siting of new high voltage electric transmission lines, especially overhead transmission lines, has historically been a difficult enterprise, characterized by strong local organized resistance in administrative, legislative, regulatory, and legal venues. If anything, the difficulties of siting such facilities have become more pronounced over time.

Now, one alternative to MAPP, a new 500 kV transmission line from Conastone to Peach Bottom to Keeney, was rejected by PJM in part because it would have taken too long to construct and place into service, relative to the projected dates of NERC reliability planning violations. However, until siting has been addressed, any new high voltage transmission line can encounter delays due to siting difficulties. I note in this proceeding that PHI was working to finalize the route through Dorchester County as of the beginning of last March, nine months ago. There still has been no siting filing. This delay may be reflective of such siting difficulties.

Siting concerns can affect electric transmission proposals by increasing their costs as well. If siting difficulties in Dorchester County, on the east side of Chesapeake Bay, mitigate a longer underwater route, in an effort to shorten or redirect the on-shore overhead portion of the two lines, the cost of the MAPP project could be higher than is currently estimated. Similar siting difficulties could also result in requiring that some parts of the proposed lines be placed underground, especially in places where there are no comparably-sized lines now. That, too, would increase costs of the MAPP Project as compared to its currently contemplated configuration. If there's enough of an increase in the cost of MAPP, a reasonably-priced Northern alternative (which I will discuss later in this testimony) may become a more reasonably-priced alternative than MAPP.

Q. HAS THE COMMISSION EXPRESSED ANY CONCERN OVER THIS STRATEGY OF DETERMINING NEED APART FROM CONSIDERING SITING ISSUES?

A. Yes. Such concerns were expressed during the March 4, 2009 Administrative Meeting, first by Chairman Nazarian, and, later, by Commissioner Brenner. The Chairman expressed concern about having a series of piece-meal rulings and what might result in the event that the need ruling gets challenged in court. Commissioner Brenner questioned what might occur if the parts of the MAPP project to the west of Calvert Cliffs were not found to justified by their own independent need. The Commissioner asked whether this might work to make the probability of successful siting of the eastern portions of the project more of an issue.[6]

## V. NEED FOR MAPP TRANSMISSION PROJECT

Q. HAVE YOU REVIEWED THE JUSTIFICATIONS USED TO SUPPORT THE NEED FOR THE MAPP TRANSMISSION LINE PROJECT?

A. Yes. The Companies provided a list of 11 reliability planning voltage violations in Exhibit PFM-1, which was included with the Direct Testimony of Paul McGlynn in the Needs Determination filed with the Companies' Application on February 25, 2009. In addition, a list of 25 reliability planning thermal violations was filed as Exhibit PFM-2, which was also included with the Direct Testimony of Paul McGlynn in the Needs Determination filed with the Companies' Application on February 25, 2009. These are violations of transmission system planning criteria promulgated by NERC[7] and others. NERC planning criteria require that the transmission system be capable of supplying projected loads with no transmission line or transformer loaded at higher than normal ratings and with all substations within normal voltage limits, under normal system conditions with all system components in service. NERC planning criteria also require that, under a single contingency, the transmission system be capable of supplying

[6] March 4 Transcript, pp. 3-6.

[7] The North American Electric Reliability Corporation ("NERC") reliability standards, which were initially developed to address the root cause of the 1965 power blackout, serve as the foundation source for standards in designing bulk power systems. The standards, previously voluntary, became mandatory and enforceable in 2005, at which time the Federal Energy Regulatory Commission ("FERC") was granted authority to fine utilities not in compliance with reliability and operating standards.

generally all projected loads with no transmission line or transformer loaded at higher than emergency ratings and with all substations within emergency voltage limits.[8]

Q. WHAT DO YOU MEAN BY A CONTINGENCY?

A. A contingency refers to an electric system occurrence when an event affects one or more individual components of the system, such as individual transmission lines, substation transformers, or generating units, which are assumed, for planning purposes, to suffer a forced outage. Typically, when a component of the transmission system is forced out of service, the rest of the system becomes more heavily loaded.[9] In order to provide reliable electric service, NERC requires that transmission system planners have to plan for a system that will deliver reliable service, even if individual components of that system suffer an unplanned outage. If one component suffers an unplanned outage, that is typically called a *single* contingency. If two components suffer unplanned outages, that is typically called a *double* contingency.

Q. WHAT IS MEANT BY THE TERM "RELIABILITY VIOLATIONS"?

A. A reliability violation occurs, for planning purposes: i) when the projected loading of any transmission line or transformer is above the normal rating of that component, or when the voltage level at any substation falls outside normal limits, assuming that all

[8] NERC planning criteria also address a number of other potential outage scenarios and planning requirements, as well. Under single contingency planning, NERC will permit limited and controlled service interruptions under certain conditions.

[9] "Loading" refers to the amount of electric power that is flowing through each transmission line or substation transformer. The more electric power that is flowing through any given transmission line or substation transformer, the heavier its load is said to be.

system components are in service; or, ii) when the projected loading of any transmission line or transformer is above the emergency rating of that component, or when the voltage level at any substation falls outside emergency limits, assuming any single contingency. Projected loadings of facilities in excess of their normal ratings under normal conditions or in excess of their emergency ratings under contingency conditions are referred to as thermal violations. Projected voltage levels that similarly fall outside normal or emergency limits are referred to as voltage violations.

Q. YOU MENTION THAT THESE TRANSMISSION STUDIES LOOK AT PROJECTED PEAK LOADS. WHY ARE PEAK LOADS IMPORTANT?

A. The amount of electric load being carried by the transmission system varies during the year. The more electric power customers use, the higher the loads are on the transmission system. Electric loads on the system are typically at their highest in the summertime. The capacity of transmission system elements, such as transmission lines or substation transformers, to carry electric power is typically the most limited during the summertime because heavy loads on lines and transformers cause them to heat up, with the surrounding air already being hot. Because of this, electric transmission system planning focuses on the system's ability to carry summertime peak loads. NERC requires that such planning be performed using projections or forecasts of what the summer peak loads are expected to be in future years, so that needed transmission system improvements can be ready and in place when needed.

Q. DO YOU HAVE ANY COMMENTS ON THE PROJECTED LOADS USED IN DETERMINING THE RELIABILITY VIOLATIONS?

A. Yes, but I will discuss these load projections after the following discussion of what is reflected in the reliability violations in Exhibits PFM-1 and PFM-2, and other related matters.

Q. PLEASE DISCUSS THE RELIABILITY VIOLATIONS THE COMPANIES PROVIDED IN FEBRUARY 2009 AS SUPPORT FOR THE NEED FOR THE MAPP TRANSMISSION LINE.

A. I have included the list of 11 voltage violations from Exhibit PFM-1 as Exhibit PJL-4 for reference, and of the 25 thermal violations from Exhibit PFM-2 as Exhibit PJL-5 for reference.

Looking first at the voltage violations, all eleven are expected to occur in 2013. Six of the eleven voltage violations involve a voltage collapse, which is an uncontrolled loss of service to customers in all of or a part of the electric grid. The remaining 5 voltage violations involve low voltage conditions at Cochranville substation (in 4 of the five) and at Newlinville substation (in 1 of the five).[10] All the voltage violations result from one of four different 500 kV transmission line contingencies, and 9 of the eleven voltage violations result from one of just two different line contingencies. The outage of the Rock Springs to Keeney 500 kV transmission line causes two of the voltage collapse

[10] Both these substations are in Pennsylvania.

scenarios and three of the low voltage scenarios. The outage of the Peach Bottom to Rock Springs 500 kV transmission line causes two of the voltage collapse scenarios and two of the low voltage scenarios.

The low voltage scenarios are typically less serious than the voltage collapse scenarios. Low voltage can typically be remedied by the addition of voltage support in the form of shunt capacitors, or other devices. Voltage collapse typically requires stronger means of reinforcement than low voltage.

Turning our attention to the thermal violations in Exhibit PJL-5 (from Exhibit PFM-2), we see that none of these violations occur until 2016 at the earliest, and only six of these 25 violations occur within the next ten years. Most (i.e. 19 out of 25) of the thermal violations are more than ten years in the future.

Q. HOW FAR INTO THE FUTURE IS IT REASONABLE TO LOOK FOR RELIABILITY VIOLATIONS?

A. The further out into the future such projections try to reach, the more uncertainty there is in such a far-reaching forecast. PJM currently uses a 15 year planning horizon for transmission system planning. NERC does not require such a long planning horizon. In the NERC standards that are the basis of most or all of the reliability planning violations discussed here, the planning assessments that look for such violations shall:

> "Be conducted for near-term (years one through five) and longer-term (years six through ten) planning horizons."[11]

The NERC standards further comment on planning horizons by specifying that planning assessments shall:

> "Be conducted beyond the five-year horizon only as needed to address identified marginal conditions that may have longer lead-time solutions."[12]

It is not clear, based on the NERC standards, that routine use of a fifteen-year planning horizon for all reliability violations, is reasonable. Such a planning horizon reflects a trade-off between: i) allowing adequate advance notice of system needs and potential reliability problems, so as to allow adequate time to gain required approvals, acquire equipment, and to construct needed system reinforcement facilities; and, ii) limiting the potential for forecasting errors that result in unneeded system investment, caused by trying to project what will occur so many years into the future. PJM justifies its use of a 15 year planning horizon as allowing it to deal with the longer lead times typically experienced by proposed major transmission system reinforcement projects. However, care must be exercised to remember that projected overloads which are more than ten

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[11] Section B, Subsection R1.2 of NERC Standard TPL-001 System Performance Under Normal Conditions, of NERC Standard TPL-002 System Performance Following Loss of a Single BES (bulk electric system) Element, and of NERC Standard TPL-003 System Performance Following Loss of Two or More BES Elements.

[12] Section B, Subsection R1.3.3 of NERC Standard TPL-001 System Performance Under Normal Conditions, Section B, Subsection R1.3.4 of NERC Standard TPL-002 System Performance Following Loss of a Single BES (bulk electric system) Element, and Section B, Subsection R1.3.4 of NERC Standard TPL-003 System Performance Following Loss of Two or More BES Elements.

years in the future are more speculative than overloads projected to occur within the next several years. Many things can happen in the next ten years that could dramatically change expected demand growth, expected energy prices, renewable resource generation, distributed generation embedded in the distribution system, and many aspects of energy usage by small and large users (e.g. demand response and energy efficiency). As I will discus in more detail later in my testimony, there have been unexpected and dramatic changes in the economy (for example changes in national and state energy policies), and in the resultant electricity usage, which have occurred since the beginning of 2008. The longer the planning horizon that is used, the better the chances for unexpected changes to occur.

Q. WHAT PROJECTED LOADS HAVE BEEN USED IN THE SYSTEM PLANNING THAT RESULTED IN THE RELIABILITY VIOLATIONS PROVIDED BY THE COMPANIES IN THEIR FEBRUARY 2009 APPLICATION?

A. The Companies' Application reflects the 2008 RTEP which uses a January 2008 peak load forecast. There are a number of potential problems that result from the use of these load projections, which were prepared before the current economic downturn.

Q. HAS PJM PREPARED ANY STUDIES OF THE EFFECT OF AN UPDATED LOAD FORECAST ON THE RELIABILITY VIOLATIONS THAT SUPPORT THE NEED FOR THE PROPOSED MAPP TRANSMISSION LINE PROJECT?

A. Yes. PJM updated its load forecast in January 2009 as part of its RTEP process. This new forecast, which essentially resulted in peak loads previously forecast for 2013 now being forecast for 2014, was reflected in Supplemental Testimony filed by the Companies in July 2009. This testimony claims to reaffirm the need for the MAPP line in 2014.

However, the updated lists of reliability thermal and voltage violations shows that 22 of the 25 thermal violations and 9 of the eleven voltage violations from the Companies' February 2009 Filing have disappeared and are apparently no longer violations during PJM's 15 year planning horizon, if at all.

Exhibit PJL-6 lists the 25 thermal violations from the Companies' Direct Testimony filed in February 2009, along with the date for each violation from the Companies' Direct Filing and the date for each violation from the Companies' Supplemental Testimony filed in late July 2009, if any. Of these 25 thermal violations, only 3 are included as violations in the Supplemental Testimony. All the rest are eliminated as violations by the modest reduction in the peak load forecast that was reflected in the Supplemental Testimony.

The thermal violations listed in the Companies' Supplemental Direct Testimony in late July 2009 are portrayed in DPL/PEPCO/BGE (PFM) Supplemental-1. These 17 thermal reliability violations are listed in Exhibit PJL-7, along with the date of each violation as reflected in the Supplemental Direct Testimony and the date of each violation as it was reflected in the Companies' Direct Testimony from February 2009.

There is a lot of duplication in these 17 violations. Of these 17 violations: i) numbers 7, 8, and 9 are for the same contingency, an outage of the #2314 High Ridge-Burtonsville 230 kV line, and the same result, an overload of the #2334 Sandy Spring-High Ridge 230 kV line; ii) numbers 10, 11, and 12 are for the same contingency, an outage of the #2334

High Ridge-Burtonsville 230 kV line, and the same result, an overload of the #2314 Sandy Spring-High Ridge 230 kV line; iii) numbers 13 and 15 are for the same contingency, an outage of the Cedar Creek-Red Lion 230 kV line, and the same result, an overload of the Townsend-Church 138 kV line; and, iv) numbers 14 and 16 are for the same contingency, an outage of the Keeney-Steele 230 kV line, and the same result, an overload of the Townsend-Church 138 kV line.  Taking into account these "duplicates"[13], there are 11 distinct contingency-result combinations reflected in these thermal violations.  Of these 11 distinct contingency-result combinations, 8 are new to this proceeding as of the Supplemental Testimony and were not mentioned in the Companies' Direct Case in February 2009.  These are indicated in Exhibit PJL-7 by the word "None" in the "Direct Filing" column.

The most inexplicable of these is number 1, an outage of the Conastone-Peach Bottom 500 kV transmission line, resulting in an overload of the Safe Harbor-Manor 230 kV transmission line in 2014.  In the Companies' Direct Testimony, this violation does not appear at all.  It is not at all clear why a decrease in peak load in the 2009 RTEP would suddenly cause an overload in 2014 on this line, when there was no overload through 2023 on this line at the higher peak loads of the 2008 RTEP.

Also inexplicable are the five double-circuit tower outages listed as numbers 2 through 6 of Exhibit PJL-7 that are included among the thermal violations included with the

[13] The differences between these "duplicates" arise from the various PJM Reliability Tests that produce the violations.

Supplemental Testimony. These five violations occur in 2016 or 2017 under the 2009 RTEP. However, apparently[14] none of these double circuit tower outages produced thermal violations, even through the year 2023, under the 2008 RTEP that was reflected in the Companies' Direct Testimony from February 2009, even though the peak loads reflected in the 2008 RTEP were generally higher than those used to develop the Supplemental Testimony, which is based on RTEP 2009. Under the lower peak loads on the 2009 RTEP, these five double circuit tower outage violations cause overloads of from 4.8% to 6.3% in 2023[15]. In order to produce overloads of this magnitude where there were none before, even as forecast peak loads are declining, the 2009 RTEP is obviously changing a lot more than just the level of peak loads. Yet, even with (or despite) these changes, the 2009 RTEP reduces the number of thermal violations from 25 to 11, and as noted above, it reduces the number of voltage violations from 11 to 2.

As referenced above, the Companies' Supplemental Testimony, based on the 2009 RTEP, has only two voltage violations, both being voltage collapse scenarios occurring in 2014, whereas in its Direct Testimony, the Companies listed 11 voltage violations, all occurring in 2013.

Q. DOES THE LOAD FORECAST THAT WAS USED FOR THE 2009 RTEP, AS DISCUSSED IN THE COMPANIES' SUPPLEMENTAL DIRECT TESTIMONY, REFLECT AN UP-TO-DATE LOOK AT PROJECTED ELECTRIC LOADS?

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[14] *See* Companies' Response to OPC Data Request No. 8-4 attached hereto as Exhibit PJL-8.

[15] *See* Companies' Response to OPC Data Request No. 8-3 attached hereto as Exhibit PJL-9.

A. The load forecast discussed in the 2009 RTEP and in the Companies' Supplemental Direct Testimony was prepared in January 2009. However, since then, the sales outlook has changed considerably for segments of the electric industry. As recently reported by SNL Financial LC in an article entitled "Retail Sales Fall in Q3 as Residential and Commercial Sales Decline Accelerates":

> "While industrial electricity sales have been dismal over the past several quarters, residential and commercial sales faced only modest declines until the third quarter of 2009. The third quarter, however, proved to be an exception with residential and commercial sales joining the battered ranks of industrial and wholesale sales.[16]

The article continues:

> "Overall, total retail sales in the third quarter declined by 5.6% from 2008 levels, according to SNL Energy data, on electric sales for 41 utility holding companies, marking the largest year-over-year decline in the last year."

Based on these perceptions of load levels in the electric utility industry, there is good reason to incorporate 2009 performance and any revised economic expectations into a revised look at the need for reinforcement in the area that would be addressed by the MAPP Project. The revisions to the load forecast used in the 2008 RTEP were based

[16] *See* "Retail Sales Fall in Q3 as Residential and Commercial Sales Decline Accelerates", November 24, 2009, by Jesse Gilbert, a copy of which is attached hereto as Exhibit PJL-10.

only on what was known as of the end of 2008. And these load forecast revisions, along with other changes in the RTEP[17], resulted in eliminating most of the reliability violations that were based on the prior forecast. Since then, despite massive amounts of government stimulus spending, unemployment has reached record levels and electric sales have been affected.

Q. WHAT OTHER SHORTCOMINGS ARE REFLECTED IN THE LOAD FORECAST USED TO DEVELOP THE 2009 RTEP?

A. Recent changes to the RPM[18] capacity "market" auction conducted in May 2009 allow energy efficiency resources to offer into the capacity auction for the first time.[19] These changes will allow such resources to be reflected in the forward looking RTEP analysis. PJM load forecasts have not historically incorporated any planned energy efficiency efforts by eastern PJM states. The impacts of such efforts will be incorporated beginning with the 2010 PJM load forecast.[20]

Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE NEED FOR TRANSMISSION SYSTEM REINFORCEMENT?

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[17] Such as reflecting the use of HVDC technology.

[18] "RPM" refers to Reliability Pricing Model. RPM is a program involving a three year forward market construct by which PJM secures capacity on behalf of load-serving entities to satisfy load obligations not satisfied through self-supply. RPM is a market "construct" because certain aspects of the RPM supply and demand curves (such as the estimated value of the cost of new entry (CONE) of a combustion turbine) are administratively determined.

[19] *See* Companies' Response to OPC Data Request No. 1-31 attached hereto as Exhibit PJL-11.

[20] *See* Companies' Response to OPC Data Request No. 3-6 attached hereto as Exhibit PJL-12.

A. The load forecast used in the 2009 RTEP is not up to date, omits the effects of energy efficiency programs, and therefore does not accurately represent the need for transmission system reinforcement. This study needs to be redone with an updated load forecast and other up-to-date information. If the result of this updated study is to further reduce the number of violations that the proposed line is intended to address, it may be that smaller and more localized transmission system reinforcements will be preferable to the proposed MAPP transmission line project.

Q. IF THE MAPP PROJECT IS VIEWED IN TERMS OF ITS INDIVIDUAL SEGMENTS, AS REFLECTED BY PSC CASE NOS. 9179, 6526 AND 6984 WHICH COMPRISE THIS PROCEEDING, IS IT CLEAR THAT THE SEGMENTS TO THE WEST OF CALVERT CLIFFS, ON THEIR OWN, ADDRESS SYSTEM PLANNING NEEDS AS REFLECTED IN NERC PLANNING VIOLATIONS?

A. No. The Companies state:

> "….the Possum Point to Calvert Cliffs segment by itself is not associated with the resolution of the reliability criteria violation for the outage of the Peach Bottom – Rock Springs 500 kV line listed as Violation 1 in PFM-Supplemental-2."[21]

The Companies go on to say that there are benefits from this line segment other than simply the resolution of specific NERC reliability criteria violations. For example, the Possum Point to Calvert Cliffs segment provides additional import capability into the

[21] *See* Companies' Response to DNR Data Request No. 5-1 attached hereto as Exhibit PJL-13.

Baltimore-Washington area.[22] However, this additional import capability is not needed to address reliability criteria violations at this time, since, as of the 2009 evaluation by PJM, there are no criteria violations for load deliverability into the Southwest Mid-Atlantic load deliverability zone.[23]

**[BEGIN CONFIDENTIAL]** [redacted][24]

[redacted]

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[22] Ibid.

[23] *See* Companies' Response to DNR Data Request No. 6-43 attached hereto as Exhibit PJL-14.

[24] [redacted]



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[redacted] **[END CONFIDENTIAL]**

Q. WILL THE MAPP PROJECT HAVE ANY OTHER IMPACTS ON THE UNDERLYING LOWER VOLTAGE FACILITIES IN THE DELMARVA PENINSULA?

A. Yes, according to the Companies' response to DNR Data Request No. 6-5,[25] when PJM modeled the power transfers over the DC circuit from Calvert Cliffs to Vienna at 1,000 MVA[26] in its RTEP studies, overloads on the Steele 230/138 #2 transformer occurred in 2015.

Q. DID PJM IDENTIFY ANY TRANSMISSION UPGRADES THAT WOULD BE REQUIRED TO ALLEVIATE THE OVERLOAD?

A. No, PJM did not describe or quantify the cost of any upgrades that would be needed to address the 2015 overload of the Steele transformer.

Q. HAS PJM REFLECTED THE COST OF ANY UPGRADES NECESSARY TO ADDRESS THE STEELE TRANSFORMER OVERLOAD IN ITS COST/BENEFIT ANALYSES?

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[25] *See* Exhibit PJL-15 attached.

[26] Refers to "mega-volt-amperes", a measure of electric power capacity.

A. No, PJM has not included the costs of upgrading the lower voltage facilities into the cost of the MAPP Project. In order to fully reflect the impact of MAPP, all costs, including upgrades to lower voltage facilities to accommodate the additional flows from MAPP should be reflected in the economic analyses.

Q. SHOULD COST BE A FACTOR IN MAKING THE DECISION OF WHETHER TO BUILD A TRANSMISSION PROJECT LIKE MAPP OR IN DECIDING BETWEEN ALTERNATIVE PROJECTS?

A. Yes, efficient resource allocation requires decisions that are made based on price signals. While any number of projects might address the reliability problems identified by PJM in their RTEP process, only by factoring into the decision-making process the cost of the various alternatives will the decision-makers arrive at the most efficient solution.

Q. IS THE PJM COST-ALLOCATION PROCESS FOR BACKBONE TRANSMISSION FACILITIES, WHICH ARE THOSE TRANMISSION FACILITIES OF 500 KV AND ABOVE, CERTAIN AT THIS TIME?

A. No. PJM's proposed method for allocating the cost of 500 kV and above transmission facilities was recently reversed and remanded to the FERC for reconsideration by the U.S. Court of Appeals for the 7th Circuit.[27] The FERC had accepted PJM's proposal to "socialize" the costs of new high voltage backbone facilities (e.g. new 500 and above kV facilities) such as the MAPP Project through a "postage-stamp" rate design. In this

[27] *Illinois Commerce Commission v. FERC*, 576 F3d 470 (7th Cir. 2009). The FERC is currently deciding whether to conduct a new evidentiary hearing or to issue an order based upon evidence in the existing record.

manner, the costs of these facilities would be shared by all ratepayers in the PJM region. The federal court's decision was based, in part, on its concern that the FERC's implementation of such "socialization" could result in a mismatch between the costs and benefits of such facilities. As Judge Posner wrote, "FERC is not authorized to approve a pricing scheme that requires a group of utilities to pay for facilities from which its members derive no benefits, or benefits that are trivial in relation to the costs sought to be shifted to its members."[28]

Q. WHAT EFFECT DOES THIS DECISION HAVE ON THE ECONOMIC ANALYSES RELATED TO THE MAPP PROJECT?

A. The analyses presented by PJM in their application calculate ratepayer cost impacts that assume PJM's socialized cost allocation approach. Those ratepayer cost/benefit analyses are now in question and might change dramatically, depending on the ultimate resolution of the PJM cost allocation issue for new, 500 and above kV transmission lines.

## VI. ALTERNATIVES

Q. DID PJM CONSIDER ALTERNATIVES TO THE MAPP PROJECT?

A. PJM claims to have considered over 30 alternatives when evaluating the need for backbone transmission system reinforcement. Insofar as transmission projects to address the voltage stability issue driven by the outage of the 500 kV line from Peach Bottom to

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[28] *Id.*, at 476.

Rock Springs, the most relevant alternative appears to be a new 500 kV line from Conastone to Peach Bottom to Keeney. Such a line would cross the eastern transmission interface into northern Delaware and would remedy the voltage collapse reliability violations resulting from an outage of the Peach Bottom – Rock Springs 500 kV transmission line.

Q. WHY WAS THE MAPP PROJECT PREFERRED OVER THIS POTENTIAL ALTERNATIVE?

A. PJM preferred the MAPP Project because it resolved reliability criteria violations that the alternative did not. In addition, MAPP could be constructed in time to address reliability violations in 2013, while the alternative would take longer to build.[29]

Q. PLEASE DISCUSS THESE REASONS FOR PREFERRING MAPP.

A. PJM considers the fact that MAPP is, or was[30], based on the relief of reliability violations, many of which were more than ten years in the future, as an advantage over a less expensive project that addresses reliability violations that occur during the more typical ten year planning horizon. As discussed earlier, there are risks in looking so far ahead and committing funds to projects as if loads, generation sources, and other factors relevant to the electric power business could be predicted 15 years in the future with even reasonable confidence, much less certainty.

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[29] *See* Companies' Response to OPC Data Request No. 1-22 attached hereto as Exhibit PJL-16.

[30] Prior to the 2009 update.

In addition, the length of time to construct MAPP has increased due to the decision to change the Chesapeake Bay crossing and the segments running from the Bay to Vienna and Indian River from HVAC technology to HVDC ("high voltage direct current") technology. The Companies have indicated that there is a three year lead time for HVDC components. Also, the time available to construct reinforcements to address the reliability violations dealing with voltage collapse has increased, as the date of these planning violations has been moved back one year.

Q. WAS COST A DECIDING FACTOR IN PREFERRING THE MAPP PROJECT TO A NEW CONASTONE-PEACH BOTTOM-KEENEY 500 KV TRANSMISSION LINE?

A. Apparently not. PJM's stated position is that proposals to remedy reliability violations are based on the best mix of facilities to resolve the violations, and that projects that address reliability violations are not dismissed because of cost.[31]

Q. HAVE THE COMPANIES REVISITED THE CONCEPT OF AN ALTERNATIVE INVOLVING A NEW TRANSMISSION LINE ACROSS THE EASTERN TRANSMISSION INTERFACE IN THE VICINITY OF NORTHERN DELAWARE AS AN APPROACH TO DEALING WITH RELIABILITY VIOLATIONS?

A. Yes, belatedly. A little more than a week ago, the Companies, at the request of DNR[32], produced a study of a new northern alternative to reinforce the Delmarva peninsula from

[31] *See* Companies' Response to OPC Data Request No. 1-33 attached hereto as Exhibit PJL-17.

[32] Refers to Maryland Department of Natural Resources.

the north. The study addresses an alternative with a new 500 kV transmission line from Kemptown, Maryland, to the Salem substation. Along this line would be a new 500kV-to-230 kV substation near Middletown, Delaware. This alternative also includes 4 converter stations for HVDC facilities and two new HVDC lines from the new Middletown substation, one to Vienna, and one to Indian River, but by way of Vienna.

Not surprisingly, this alternative costs more than the MAPP Project is currently estimated to cost, and takes a longer time to build. But, these higher costs and longer construction times for this particular northern alternative are due (at least in part) to the fact that they seem to include significant costs for facilities that do not appear to be needed to address NERC reliability violations. The choice of Kemptown as one terminal for the 500 kV line, the choice of a new substation in Middletown, the choice of HVDC technology for lines that are not crossing the eastern transmission interface, and the choice to route the second HVDC line via Vienna on its way to Indian River are but some of the questionable aspects of this alternative.

Given the very limited time that was available to review this northern alternative, the inability to incorporate information from discovery responses, and the tight schedule for preparing my testimony, it is not possible to address this alternative to the degree that is warranted at this time. I intend to supplement this testimony on this subject.

## VII. ECONOMIC BENEFIT STUDY

Q. IS THERE INFORMATION IN THE COMPANIES' APPLICATION REGARDING THE ECONOMIC IMPACT OF THE MAPP PROJECT ON RATEPAYERS IN THE REGION?

A. Yes, in the Companies' original Application, Witness Kenneth Collison provided information on analysis performed by ICF International ("ICF") for the Companies. ICF performed a market efficiency study to assess the economic benefits of the MAPP Project in various load zones of the PJM Interconnection. ICF used two scenarios of input assumptions—a first set of assumptions based on ICF's view of future conditions and a second set of assumptions from PJM. The economic impact of the scenario representing the HVDC configuration of the MAPP Project using both ICF and PJM assumptions is summarized below[33].

EXPECTED REDUCTION IN ANNUAL PRODUCTION COSTS

| | Original Analysis | Sensitivity Analysis Varying Amount of Canadian Power Imported |
|---|---|---|
| ICF Assumptions | $58 million | $99 million |
| PJM Assumptions | $24 million | $42 million |

INCREASE (DECREASE) IN ANNUAL CONSUMER PAYMENTS

(2013$ millions)

[33] The sensitivity analysis reflects variations in Canadian power transfers.

| | Delmarva | Pepco | Mid-Atlantic | PJM RTO |
|---|---|---|---|---|
| ICF Assumptions | (14) | (14) | (174) | (91) |
| ICF Sensitivity (Canadian) | (16) | (12) | (230) | (180) |
| PJM Assumptions | (9) | (10) | (109) | (66) |
| PJM Sensitivity (Canadian) | (11) | (9) | (163) | (129) |

Q. WAS THE ORIGINAL MARKET EFFICIENCY STUDY PERFORMED BY ICF REVISED?

A. Yes, in Supplemental Testimony filed on July 31, 2009, Witness Kenneth Collison described the changes to the market efficiency study. ICF revised its analysis to reflect the 2009 PJM load forecast, to reflect the new 2014 in-service date of the Project and to remove the segment of the Project from Indian River to Salem.

Q. HOW DID THOSE CHANGES TO THE INPUT ASSUMPTIONS CHANGE THE ECONOMIC IMPACTS?

A. The revised economic impacts to the sensitivity scenario are:

EXPECTED REDUCTION IN ANNUAL PJM RTO PRODUCTION COSTS

| | July 31, 2009 Update |
|---|---|
| ICF Assumptions (Original) | $99 million |
| ICF Assumptions (Updated) | $73 million |

INCREASE (DECREASE) IN ANNUAL CONSUMER PAYMENTS

(2013$ millions) July 31, 2009 Update Sensitivity Scenario

| | Delmarva | Pepco | Mid-Atlantic | PJM RTO |
|---|---|---|---|---|
| ICF Assumptions Original | (16) | (12) | (230) | (180) |
| ICF Assumptions Updated | (13) | (11) | (182) | (179) |

In its description of the updated market efficiency study that was filed on July 31, 2009, only the scenario that used the ICF inputs and reflected the sensitivity of variation in Canadian power transfers was reported. In the original analysis filed with the Application, however, *four* different scenarios were prepared. Each of these four alternatives contained, respectively, a separate scenario using ICF and PJM data inputs, and each had a sensitivity analysis with varying Canadian power transfers. The scenario that resulted in the highest economic benefit, the ICF scenario with the sensitivity analysis varying Canadian power transfers, was used for comparison purposes with the updated market efficiency results. For example, the reduction in PJM production cost payments for the ICF sensitivity analysis was $99 million compared to the lowest of the four scenarios, the PJM non-sensitivity analysis of $24 million. This comparison illustrates two important points: the significant impact that changing data assumptions can have on the results, and how selective reporting of scenario results can influence the perception of the economic results.

Q. DID THE COMPANIES PRESENT AN ANALYSIS OF THE IMPACT OF THE COST OF THE MAPP PROJECT ON RATEPAYERS IN THE REGION?

A. Yes, the Companies' Witness Anthony Kamerick reported the impact of the updated MAPP Project costs on ratepayers in his Supplemental Testimony. This reflects a reduction in MAPP Project costs from $1.4 billion to $1.2 billion because of the removal of the Indian River to Salem segment. The $1.2 billion MAPP cost translates to a $240 million annual cost to the region in 2014. In his analysis, Mr. Kamerick assumed that the costs of the MAPP Project would be socialized across all ratepayers in the region, so only 4.95% of the costs were allocated to the Pepco Zone and 2.9% to the Delmarva Zone. The load in the Pepco zone would pay $11 million annually ($6 million from Maryland) and the Delmarva zone would pay $7 million ($3.4 million from Maryland). The share to the BG&E zone would be $11.9 million.

Q. HOW DOES THIS COMPARE TO THE BENEFITS FROM MAPP?

A. Based on the results of the updated market efficiency study that reported only the most favorable scenario, the Pepco Zone would realize $11 million in decreased annual consumer payments but would see an equal increase in costs from the cost of MAPP of $11 million. The Delmarva zone would see a decrease in annual consumer payments of $13 million with an annual increase of $7 million related to the cost of the MAPP Project.

The $240 million annual cost of MAPP is higher than the range of ICF-projected reduction in consumer payments to the PJM RTO of $66-$180 million in the original analysis and the $179 projection from the updated analysis. The relationship of the costs to the benefits would change dramatically if PJM's socialization of backbone costs is changed as a result of the reconsideration currently being undertaken by the FERC as a result of the Seventh Circuit's recent reversal and remand pertaining to this issue.

## VI. SUMMARY

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS.

A. My conclusions are as follows:

a. Based on the Companies' Application, the Companies failed to demonstrate a need for the MAPP Project as described in the Application, due to what is absent from the Application. The Companies did show a need for some type of upgrades at some time in the future.

b. Based on the Companies' filings in this proceeding, there will be a need for some system reinforcement by 2014, or later. However, the immediacy of this need is called into question because recent economic changes that have reduced electricity consumption, and other relevant factors, have not adequately been incorporated into the planning that underlies the Companies' filing. The PJM study supporting the need for the MAPP project needs to be updated to reflect the most up-to-date information. Such information should be forthcoming in early January 2010.

c. The studies of the economic benefits prepared by the Companies shows that projected costs from MAPP will be greater than the projected potential benefits. No separate estimates of benefits and costs were prepared for the individual segments of MAPP. If recent challenges to the socialization of high voltage transmission costs across all of PJM become policy, then the Companies' customers could see even higher costs from the MAPP Project than as reflected in these studies.

d. Project cost for the MAPP Project should be considered, relative to the costs for alternative approaches to addressing reliability violations, when determining whether MAPP is needed.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, at this time.