STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

IN THE MATTER OF THE PETITION OF PUBLIC SERVICE ELECTRIC AND GAS COMPANY FOR A DETERMINATION PURSUANT TO THE PROVISIONS OF N.J.S.A. 40:55D-19	:	**BPU DOCKET**
(SUSQUEHANNA-ROSELAND)	:	

PRE-FILED DIRECT TESTIMONY OF PAUL F. MCGLYNN ON BEHALF OF PUBLIC SERVICE ELECTRIC AND GAS COMPANY IN SUPPORT OF SUSQUEHANNA-ROSELAND TRANSMISSION LINE PROJECT

I. BACKGROUND

Q. Please state your name and business address.

A. My name is Paul F. McGlynn, and my business address is 955 Jefferson Avenue, Valley Forge Corporate Center, Norristown, Pennsylvania 19403-2497.

Q. By whom are you employed and in what capacity?

A. I am employed by PJM Interconnection, L.L.C. ("PJM"), a regional transmission organization ("RTO"), as a Manager in the PJM Transmission Planning Department. In that position, I am responsible for all aspects of the transmission planning analysis conducted by PJM. My responsibilities include assessing long-term transmission system adequacy and reliability to recommend bulk transmission system expansion or enhancement options; integrating the results of the baseline reliability analysis with the market efficiency and generation and merchant transmission interconnection analyses into the overall Regional Transmission Expansion Plan ("RTEP") for PJM; and managing and mentoring thirteen transmission engineers. I serve as chair of the PJM Transmission Expansion Advisory Committee ("TEAC").

Q. Please describe your professional experience and educational background.

A. I have been employed by PJM since 2007 as Manager in the PJM Transmission Planning Department. Prior to joining PJM, I was employed by PECO Energy, a subsidiary of Exelon, for 21 years where I began work as an Engineer in the Electrical Engineering Division. I was promoted to Manager of Engineering in Transmission and Substations in 1995. I transferred to System Operations in the Operations Planning Department in 1998. I was promoted to Shift Manager in System Operations in 1999 and to Manager in Operation Planning in 2001. I became Manager in Transmission Control in 2003.

At PECO, I was responsible for engineering and design of transmission and substation equipment, including protective relay systems; providing engineering and technical support of PECO's transmission and substation organization; short-term transmission system planning studies, developing operating procedures and preparing and presenting training courses; directing the real-time operation of the Transmission System; short-term transmission planning, outage coordination, dispatcher training, procedure development and real-time control room support; and managing the real-time personnel and activities of the transmission control center.

I am a licensed Professional Engineer in the Commonwealth of Pennsylvania and a NERC Certified System Operator – Reliability Operator. I hold a Bachelor of Science degree in Electrical Engineering from the Pennsylvania State University and a Master of Science degree in Electrical Engineering from Drexel University.

Q. Please describe the purpose of your testimony.

A. I have been asked by Public Service Electric and Gas Company ("PSE&G") to demonstrate the electrical need for the New Jersey segment of the Susquehanna to Roseland 500 kV line (the "Project"). Steven R. Herling, John M. Reynolds and PSE&G witness Esam Khadr are also providing testimony relating to the electrical need for these transmission line segments and the planning process that resulted in the determination of that need.

Q. Describe PJM's RTEP Analytical approach.

A. PJM's RTEP analytical approach identifies transmission system upgrades and enhancements to preserve the reliability of the electricity grid. PJM reliability planning encompasses a comprehensive series of detailed analyses to ensure reliability under the most stringent of the applicable NERC, PJM and local reliability criteria. The RTEP process is conducted using five-year and fifteen-year planning horizons to assess reliability criteria violations. PJM performs a five-year baseline analysis to assess compliance with reliability criteria and identifies transmission upgrades needed to meet near-term demand growth for customers' electricity needs. The five-year baseline includes the current year plus five years. The process considers existing generation, as well as new resources stemming from Interconnection Requests for new generating plants and merchant transmission facilities.

As part of this near-term planning effort, and in addition to the detailed review of the current year plus five, PJM also conducts a "retool" study, which consists of a review of the time period covered in previous assessments. For each of the near-term years, PJM issues updates to the previous assessments as needed to account for planned generation or demand response modifications, changes in transmission topology and updated load forecasts. PJM also performs long-term reliability planning on a 15-year horizon. Under the long-term planning, PJM evaluates the needs of the system from 6 years out to 15 years. The purpose of this longer term analysis is to identify developing trends that will require long-lead-time solutions.

The first step in the process is to develop a power flow case for the current year plus five years out. During this step, PJM models the expected future system conditions. Development of the future power flow case requires PJM to make a number of assumptions about the future state of the system. For example, PJM must apply initial assumptions regarding load forecasts, the development, or retirement, of generation, demand response resources, and electricity transfer levels between portions of the grid. Pursuant to the PJM Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. ("Operating Agreement"), PJM documents all the assumptions, which are then thoroughly vetted through the PJM stakeholder process.

After developing the base power flow case, PJM conducts a comprehensive series of studies, consistent with all applicable reliability criteria including the NERC planning standards, to identify potential thermal, voltage and stability issues. The applicable reliability criteria include the PJM deliverability criteria, transmission owner criteria, regional reliability organization criteria and NERC criteria.

Q. Please explain NERC criteria applicable to transmission planning.

A. NERC has been designated by the Federal Energy Regulatory Commission ("FERC") as the Electric Reliability Organization for the United States. Mandatory reliability standards developed by NERC, and approved by FERC, are used by transmission planners to measure the need for new transmission lines or upgrades to existing lines. In addition, transmission owners and PJM have developed planning reliability standards to supplement the NERC reliability standards. The NERC, transmission owner and PJM planning reliability standards (collectively, "Reliability Standards") were the criteria used to determine that the Susquehanna to Roseland Project, as part of the overall reliability solution, is needed to prevent electric reliability problems from occurring.

PJM tests for compliance with all reliability criteria imposed through the NERC Planning Standards. The NERC reliability standards require that PJM identify the "critical system conditions" that the system must be evaluated against to ensure that it meets the performance criteria specified in the standards. PJM establishes the critical system conditions through the application of its generator deliverability and load deliverability test procedures. I will describe these procedures more fully later in my testimony.

With the critical system conditions established, the NERC reliability standards require PJM to test various types of events to ensure that the system meets the performance criteria in the standards. The types of events fall into three categories: A, B, and C. NERC Category A criteria require that, for all facilities in service, equipment thermal ratings and system voltage limits are respected and that the system is stable. NERC Category B criteria impose similar requirements with one facility removed from service. This is referred to as the "n minus 1" or "n-1" criteria. These criteria ensure that the system continues to remain reliable upon the instantaneous outage of a generator or transmission system element.

NERC Category C criteria require the system to be stable and within applicable equipment thermal ratings and system limits. Such events include second contingencies, involving the loss of one system element followed by system readjustments, and then the loss of a second system element. This is referred to as the "n minus 1 minus 1" or "n-1-1" criteria. Category C also includes events such as the loss of two circuits on a single tower line or a single faulted system element followed by a circuit breaker failing to operate, which is referred to as a stuck breaker. While generation re-dispatch is allowed after the loss of the first element in an n-1-1 event, PJM does not dispatch generation in anticipation of loss of tower line events or stuck breaker events and the test of compliance with these criteria, therefore, does not allow generation patterns to be adjusted for these type of events.

Q. How are the reliability standards used to determine when new transmission lines or upgrades to existing lines are needed?

A. PJM, in conjunction with its transmission owners, conducts studies of the PJM transmission system that apply the Reliability Standards to specific conditions on the transmission system. When the studies show an inability of the transmission system to meet a specific Reliability Standard under these conditions, construction of one or more new transmission lines or one or more enhancements to existing transmission facilities is necessary.

Q. What type of studies is used to determine if transmission system upgrades are necessary?

A. As noted previously in my testimony, PJM conducts a series of detailed analyses to ensure reliability under the most stringent of the applicable criteria. To maintain reliability, capacity resources must contribute to the deliverability of energy within PJM in two ways. First, within an area experiencing a localized capacity emergency or deficiency, energy must be deliverable from the aggregate of the available capacity resources to load. In addition, capacity resources within a given electrical area must, in aggregate, be able to be exported to other areas of the PJM region. PJM has developed two tests to verify compliance with each of these deliverability requirements: the PJM load deliverability test and the PJM generator deliverability test.

The load deliverability test examines defined load zones within the PJM region and considers the ability of the transmission system to deliver adequate power to the load zone during a generation capacity emergency. The generator deliverability test evaluates the capability of the transmission system to assure that capacity resources can be delivered to the remainder of the PJM system at peak load. The deliverability tests establish a link between generation resource adequacy for the region and the transmission adequacy necessary to deliver the generation resources to loads. Both types of studies are conducted by simulating the transmission system as it is expected to exist during future time periods. The simulation includes expected load growth (for the load deliverability test this includes the anticipated benefits of demand side management and conservation activities), the addition of new generating plants and the retirement of existing generation plants, and planned transmission construction projects.

In addition, PJM tests for compliance with all locally established reliability criteria (*i.e.*, Transmission Owner reliability criteria). Such criteria may, for example, require a higher degree of reliability through more stringent standards in urban areas. In all cases, such local criteria are documented and posted on the PJM Web site.

PJM's load deliverability and generator deliverability tests are the accepted procedures by which PJM studies NERC Category B contingencies. The NERC Reliability Standards require PJM and the transmission owner to establish procedures that apply "stress" to the transmission system as part of the application of NERC Category B contingencies. Specifically, R1.3.2 of NERC

Standard TPL-002-0 empowers PJM to conduct assessments in order to be valid, cover critical system conditions and study years as deemed appropriate by the responsible entity – in this case, PJM. The load deliverability and generator deliverability tests are PJM's documented method to stress the PJM transmission system to assure reliability under "critical system conditions" as provided for in NERC Standard TPL-002-0.

Q. Please explain how generation modeling assumptions are applied to the RTEP process.

A. Generator and transmission Interconnection Requests are a significant driver of regional transmission expansion needs. The RTEP process baseline analyses include previously processed generators and transmission modifications as starting point assumptions. Once an interconnection customer has executed a Facilities Study Agreement, PJM includes the generator along with all of its identified network upgrades. PJM includes generators with an executed Facilities Study Agreement in its base case in order to allow the generator to contribute to generator deliverability problems; however, PJM does not include a generator that only has a signed Facilities Study Agreement to relieve system problems. This approach ensures that the transmission system will be able to accommodate the generator if the generator ultimately completes the interconnection process and goes into commercial operation. PJM uses this approach for Interconnection Requests that have not executed an Interconnection Service Agreement because of the considerable uncertainty regarding whether a new generator will ultimately go into service. The table below illustrates the drop out rate of Interconnection

Requests at each stage of the interconnection process. The table shows that 56% of the Interconnection Requests drop out after completion of the Feasibility Study; approximately 16% of the generators drop out after the System Impact Study is completed; and only 4% of the Interconnection Requests that execute an Interconnection Service Agreement drop out before going into operation.

	Drop Out Rate by Number of Projects	
	%	**TOTAL**
Feasibility Study Agreement	56%	56%
System Impact Study Agreement	16%	72%
Facilities Study Agreement	5%	77%
Interconnection Service Agreement	4%	81%

Thus, given this low drop out rate, once a generator executes an Interconnection Service Agreement, it is modeled in all subsequent baseline analyses the same way an existing Generation Capacity Resource is modeled, *i.e.*, the generator is included in the baseline and is allowed to contribute to system problems and to relieve system problems.

II. EXHIBITS

Q. Please identify the exhibits to your testimony.

A. I am sponsoring one exhibit with my direct testimony, Chart A (PFM-1).

III. ELECTRICAL NEED FOR THE SUSQUEHANNA – ROSELAND TRANSMISSION LINE PROJECT

Q. Did you have a role in determining the electrical need for the Susquehanna-Roseland Project?

A Yes. In my role as PJM's Manager Transmission Planning, I supervised the creation of the base cases for the 2007 and 2008 RTEP and power system studies, including the subsequent "retool" studies that determined the need for the Susquehanna – Roseland Project.

Q. Describe the Susquehanna-Roseland Project.

A. The Susquehanna – Roseland Project is a new 500 kV line. The new line will interconnect the Susquehanna 500 kV Substation in the PPL transmission zone to a new 500 kV Substation at Lackawanna. From the Lackawanna Substation, the line will cross into New Jersey to a new 500 kV Substation at Jefferson. From the Jefferson station, the line will continue east to the Roseland Substation in the PSE&G transmission zone. There will be two 500 / 230 kV transformers at Lackawanna Substation to interconnect to the existing 230 kV facilities in the area. At the Jefferson Substation, the line will interconnect with an existing 500 kV line that interconnects the Branchburg and Ramapo Substations. At

Roseland/East Hanover, there will initially be two 500 / 230 kV transformers to interconnect with the existing 230 kV system.

Q. What studies did you perform or supervise the performance of as Manager Transmission Planning that determined the need for the Susquehanna-Roseland Project?

A. I supervised all of the analysis conducted as part of the 2007 and 2008 RTEP cases –including model development, identifying reliability criteria violations, and formulating solutions to violations. Specifically with regard to the electrical need for the Susquehanna - Roseland Project, I supervised the generator deliverability and load deliverability tests.

Q. What role did PSE&G have with regard to those studies?

A. PSE&G provided electrical model data for the PSE&G transmission zone within PJM and the contingency files used in the analysis. In addition, PSE&G reviewed the model once it was created by PJM. PSE&G worked closely with my staff at PJM in validating the reliability criteria violations and formulating the Susquehanna - Roseland solution.

Q. What conclusions were reached as a result of those studies?

A. Based on the latest studies performed by PJM and the transmission owners, PJM, PPL and PSE&G concluded that there are 23 potential electric reliability violations that are expected to occur beginning in 2012, and extending out through PJM's 15-year planning horizon of 2022. The potential electric reliability violations are expected to occur on facilities across Southeastern Pennsylvania and Northern New Jersey for the PJM Generation Deliverability criteria and the PJM Load Deliverability Criteria. There were five generator deliverability criteria violations, with the most severe problem on the Greystone to Whippany 230 kV line in the Jersey Central Power and Light transmission zone. Other generator deliverability criteria violations are expected to occur on the Kittatinny to Pohatcong 230 kV line in the Jersey Central Power and Light transmission zone, the Martins Creek to Morris Park 230 kV line, which is a tie line between the PPL and the Jersey Central Power and Light transmission zones, the Portland to Kittatinny 230 kV line, which is a tie line between the MetEd and the Jersey Central Power and Light transmission zones and the Portland to Greystone 230 kV line, which is also a tie line between the MetEd and the Jersey Central Power and Light transmission zones.

The remaining potential electric reliability violations were identified for the PJM load deliverability criteria. Nine of these violations were for PSE&G load deliverability conditions, with the most severe problem on the Branchburg to Readington 230 kV line in the PSE&G transmission zone. Other PSE&G load deliverability criteria violations are expected to occur on the Bushkill to Kittatinny 230kV line, which is a tie line between PPL and the Jersey Central Power and Light transmission zones, the Montville to Roseland 230 kV line which is a tie line between the PSE&G and Jersey Central Power and Light transmission zones, the West Wharton to Greystone 230 kV line in the Jersey Central Power and Light transmission zone, the Kittatinny to Newton 230 kV line in the Jersey Central Power and Light transmission zone, the Newton to Lk Iliff 230 kV line in the Jersey Central Power and Light transmission zone and the Lk

Iliff to Montville 230 kV line in the Jersey Central Power and Light transmission zone, the Glen Gardner to Chester 230 kV line in the Jersey Central Power and Light transmission zone and the Gilbert to Morristown 230 kV line in the Jersey Central Power and Light transmission zone.

Two of the violations were for the PSE&G North load deliverability criteria, with the most severe potential electric reliability violation on the Readington to Roseland 230 kV line, which is a tie line that interconnects the Jersey Central Power and Light transmission zone with the PSE&G transmission zone. The other potential electric reliability violation for the PSE&G North load deliverability criteria was on the Whippany to Roseland 230 kV line which is also a tie line interconnecting the Jersey Central Power and Light transmission zone with the PSE&G transmission zone.

Two of the violations were for the Jersey Central Power and Light load deliverability criteria, with the most severe potential electric reliability violation on the East Windsor to Smithburg 230 kV line in the Jersey Central Power and Light transmission zone. The other potential electric reliability violation for Jersey Central Power and Light load deliverability criteria was on the Cox's Corner to Lumberton 230 kV line in the PSE&G transmission zone.

There were five violations for the Eastern Mid-Atlantic load deliverability criteria, with the most severe potential electric reliability violation on the Martins Creek to Portland 230 kV line which is a tie line that interconnects the PPL transmission zone with the MetEd transmission zone. The other potential electric reliability violations for the Eastern Mid-Atlantic load deliverability criteria were on the Richmond to Camden 230 kV, which is a tie line that interconnects the PECO Energy transmission zone with the PSE&G transmission zone, the Waneeta to Richmond 230 kV line in the PECO Energy transmission zone, the Hosensack to Elroy 500 kV line which is a tie line that interconnects the PPL transmission zone and the PECO Energy transmission zone and the Bridgewater to Middlesex 230 kV line in the PSE&G transmission zone.

. These problems are identified on Chart A attached to my testimony as Susquehanna - Roseland Exhibit PFM-1.

Q. Please explain Chart A.

A. The left column identifies possible electrical occurrences or "contingencies" and the right column identifies the electrical result of the occurrence, if the occurrence occurs any time after June 2012 for occurrences 1 through 3, any time after June 2013 for occurrence 4, any time after June 2014 for occurrences 5 through 7, any time after June 2015 for occurrence 8, any time after 2016 for occurrences 9 and 10, any time after June 2017 for occurrences 11 through 14, any time after June 2018 for occurrence 15, any time after June 2019 for occurrences 16 through 19, any time after June 2020 for occurrence 20, and any time after June 2021 for occurrences 21 through 23. Using occurrence 1 as an example, the Greystone Q to Whippany 230 kV line exceeds the normal rating of the line. Using occurrence 2 as an example, if there is an outage of the Whippany – Roseland 230 kV line (*e.g.*, an unscheduled outage due to a storm or equipment failure) the power flowing across the Branchburg – Readington 230 kV line will increase to provide back-up transmission capacity. However, due to the growing consumer load served by these lines, it is projected that by the Summer of 2012 the Branchburg – Readington 230 kV line will not have enough capacity to deliver all of the electricity needed by the consumers ordinarily served by the two lines together. As a consequence, while the Whippany – Roseland 230 kV line is not operational due to the outage, the Branchburg – Readington 230 kV line will be overloaded.

Q. Chart A refers to "normal rating," "emergency rating" and "overloads." What do these terms mean?

A. "Normal Rating" in the context of Chart A refers to the equipment loading limit that should not be exceeded under normal conditions with all other equipment in service. "Emergency Rating" in the context of Chart A refers to the equipment loading limit that should not be exceeded after the outage of the other power system equipment. As an example, the loading on line A should not be above its emergency rating for the outage of line B. The term "Overload" is used to describe the condition under which the equipment loading exceeds the applicable rating.

Q. Please explain the concept of "electric reliability."

A. "Electric reliability" or "reliability," as used by industry experts, refers to the delivery of electricity to customers in the amounts desired and within acceptable standards for frequency, duration and magnitude of outages and other adverse conditions or events. "Load pockets" are created when a major electric load center (*i.e.*, an area where there is a highly concentrated use of electricity) has too little local generation of electricity relative to its electric load and must import much of its electricity via transmission lines from neighboring regions. Because it is very difficult to site and build new generation within urban areas, these areas become load pockets. As a result, transmission lines that are required to deliver energy into the load pocket from distant generating plants will often experience reliability problems. In other words, these lines become "overloaded" and do not have the capacity to deliver to the load pocket as much electricity as is needed to meet consumer demand. Reliability problems occur when the lines become overloaded. Importantly, these reliability problems are not limited to the load pocket; frequently they can adversely affect the areas surrounding the transmission facilities needed to carry that generation to the load pockets.

Q. How are reliability problems avoided?

A. New or upgraded transmission lines must be constructed before the reliability problems occur. Alternatively, new generating plants can be constructed in the load pocket. Consumers within the load pocket could also reduce their demand. As indicated previously, it is very difficult to build new generating plants in urban areas. Demand reduction initiatives which are largely voluntary cannot guarantee the mitigation of the relevant reliability risks. Demand Response resources located within the load pocket that make a financial commitment to PJM's capacity market through RPM can also help to avoid reliability problems. However, even if demand reduction is being encouraged and new generation is being explored, construction of new or upgraded transmission lines is often essential to prevent identified reliability problems from occurring while those alternatives are pursued and to account for the probability that those alternatives will not materialize in sufficient quantity to eliminate the reliability problem. However, as I will describe more fully later in my testimony, transmission planning is not a "one time" activity. Instead, it is dynamic and involves an ongoing review of changes in the transmission system that result from the decommissioning of existing plants, the addition of new plants, changes in load patterns, and other events that affect the topology of the transmission system.

Q. What happens when a transmission line overloads or exceeds its loading capability?

A. When a transmission line overloads, the conductor, the hardware securing the conductor and the line terminal equipment begins to overheat. Overheating the conductor may cause the line to sag low enough to bring the line into contact with whatever is underneath it. Under these conditions, the metal in the conductor may become brittle, rendering it useless. In addition, the line may break and fall to the ground causing a potentially dangerous situation for those near the line, as well as the crews required to respond to the event. In short, overloading transmission lines may cause permanent damage to transmission infrastructure and catastrophic power outages.

Q. What action is required to prevent these results?

A. To prevent the consequences of a potential transmission line overload, immediate action must be taken by system operators before the line or related equipment fails or is permanently damaged. The action may include turning specific generating plants off or on, opening or closing specific transmission lines, or discontinuing electric service to certain customers or groups of customers in specific areas. However, these are emergency or temporary measures only. They prevent a specific breakdown on that occasion but do not solve the underlying problem. On a long-term basis, construction of one or more new transmission lines or one or more enhancements to existing lines is necessary.

Q. Please identify and describe the reliability standards that will be violated by the reliability problems identified in Chart A if the Susquehanna-Roseland Project is not constructed.

A. Electrical occurrences 1 and 7 are violations of NERC Reliability Standard TPL-001. This standard requires that the bulk electric system be able to meet customer demands and maintain firm transmission service with all facilities in service. Electrical occurrences 2 through 6 and 8 through 23 are violations of NERC Reliability Standard TPL-002. This standard requires that the bulk electric system be able to meet customer demands and maintain firm transmission following the loss of a single bulk electric system element. All of the electrical occurrences shown in Chart A are also violations of the PJM Deliverability criteria. Electrical occurrences 2 through 9, 11, 13 through 15, 17 through 19 and 21 through 23 are violations of the PJM load deliverability criteria. Electrical occurrences 1, 10, 12, 16 and 20 are violations of the PJM Generator Deliverability criteria.

If the Susquehanna - Roseland Project is not constructed, PJM, as the regional planning authority, will be in violation of these Reliability Standards.

Q Did these studies identify any load zones affected by these reliability problems?

A. Yes. As noted in my previous responses, potential reliability violations were identified in multiple transmission zones in eastern Pennsylvania and New Jersey. The studies indicate that the loads (*i.e*. consumer demand) in the PSE&G area within the PJM region will reach a high enough level by 2012 that the electric reliability to these areas will be significantly jeopardized if the Susquehanna - Roseland Project is not constructed. The studies also indicate that the loads in the Eastern Mid-Atlantic area of PJM will reach a high enough level by 2014 that electrical reliability to these areas will be significantly jeopardized if the Susquehanna – Roseland Project is not constructed. This area encompasses the State of New Jersey, the Delmarva Peninsula and southeastern Pennsylvania, including the major metropolitan areas of Philadelphia, Pennsylvania, Newark, New Jersey and Wilmington, Delaware.

Q Please identify the major utilities that provide electric service to customers in the eastern mid-Atlantic area.

A. The major utility service areas constituting the Eastern Mid-Atlantic area for the purposes of my direct testimony are Rockland Electric Company, Public Service Electric and Gas Company, Jersey Central Power and Light Company, Atlantic City Electric Company, Delmarva Power and Light Company and PECO Energy Company.

Q. What is the primary factor causing the electrical need for the Susquehanna-Roseland Project?

A. Consumer demand in the Eastern Mid-Atlantic area is the main factor causing the electrical need for these facilities. Generation and demand response programs have not developed in sufficient quantity to make up for increased consumer demand in the region. There are primarily two components to consumer demand, the increase in the number of consumers using electricity and the increase in the amount of electricity each consumer uses. Naturally as the population increases, the demand for electricity increases as well. Also, consumers are adding more equipment that uses electricity, thereby increasing the amount that each consumer uses.

Q. When was the need for the Susquehanna-Roseland Project first identified?

A. The need for the Susquehanna - Roseland Project was first identified as part of the 2007 RTEP. The 2007 RTEP's assessment of 2012, which included all previously identified RTEP projects with required in-service dates before June 2012, identified multiple 230 kV overloads in the Eastern Mid-Atlantic area of PJM throughout its 15-year planning horizon ending in 2022. A number of alternatives were identified to resolve the projected violations. The various violations were evaluated and reviewed with stakeholders. Ultimately, the Susquehanna - Roseland Project was selected as the best alternative to resolve the multiple reliability criteria violations that were identified throughout the 15-year planning horizon.

Q. Is the analysis that was done as part of the 2007 RTEP the most recent analysis demonstrating the need for the Susquehanna-Roseland line?

A. No, as I discussed earlier, the RTEP is a dynamic process and is based on a number of assumptions including load forecast, expected generation availability and demand response. Each of those assumptions can have an impact on the results of the RTEP analysis. As a result, each year PJM updates the assumptions that were used in previous assessments. The 2007 RTEP analysis identified a number of violations on multiple lines in the Eastern Mid-Atlantic area of PJM. In the case of the 2008 RTEP, with the updated assumptions about generation availability, load forecasts and demand response, the analysis validated PJM's previous findings and confirmed the required in-service date for the project.

Q. What were some of the differences in assumptions between the analysis that was done in 2007 and the analysis that was completed in the fall of 2008?

A. The 2007 RTEP showed a number of violations on many of the same facilities identified in Exhibit PFM-1. These violations were based on the modeling assumptions that went into the 2007 RTEP, including load forecast, expected generator availability, and expected demand response. The need for the Susquehanna – Roseland Project was initially identified using these assumptions. However, PJM obtained updated information about its initial assumptions through 2007, and into 2008, which were incorporated into PJM's most recent assessments. For example, while the 2007 RTEP analysis was in progress, generators announced their intention to retire prior to 2012. Similarly, generators that had announced their intentions to retire prior to 2012 withdrew their deactivation notice. In addition, new interconnection customers progressed through the interconnection process and executed Facilities Study Agreements and Interconnection Service Agreements. In addition, PJM conducted several RPM Auctions throughout 2007 and 2008, which provided updated information regarding Demand Response, as well as generators who had given prior notice to retire.

As a result of such changes in assumptions, PJM updated its analysis to incorporate the latest modeling assumptions. PJM's most recent analysis was completed in the fall of 2008. Updated load information was obtained from the 2008 PJM Load Forecast Report. Generation that had signed an Interconnection Service Agreement as of September 22, 2008 as well as Demand Response forecasts from PJM's most recent RPM Auction, were incorporated into the analysis. The results of this updated analysis confirmed the need for the Susquehanna – Roseland Project by 2012. Similar to the 2007 analysis, the updated 2008 analysis showed multiple violations on many of the same lines identified in PJM's earlier assessments.

Q Earlier in your testimony you stated that the Susquehanna-Roseland Project was the best alternative to resolve the criteria violations identified in Chart A. Please explain why Susquehanna-Roseland is the best alternative.

A. Based on a review of all of the alternatives considered, PJM recommended the construction of the Susquehanna - Roseland Project as the best solution because the Susquehanna - Roseland solution was the most effective at resolving the multiple reliability criteria violations.

Q. What specific electrical alternatives did PJM study and/or consider to the construction of the Susquehanna-Roseland Project?

A. In addition to the Susquehanna – Roseland solution that was selected, consideration was also given to a new 500 kV line from a new substation called Bossards in eastern Pennsylvania to Jefferson to Roseland and a new 230 kV line from Stanton substation in Pennsylvania to Roseland. PJM staff evaluated each of these alternatives to determine the impact of the alternative on the loading of overloaded facilities throughout the 15-year planning horizon. The 230 kV line from Stanton to Roseland was not a robust enough solution as violations on many of the lines were only resolved for two to three years. The Bossards to Roseland 500 kV line and the Susquehanna - Roseland 500 kV line provided similar relief on the overloaded facilities throughout the 15-year planning horizon with the Susquehanna – Roseland line providing more relief on the East Windsor to Smithburg 230 kV line and the Larrabee to Atlantic 230 kV line. In addition, the Susquehanna to Roseland line will reduce the loading on the underlying 230 kV system.

Q Were any electrical alternatives that involved upgrading or expanding existing transmission facilities considered?

A. Yes. Consideration was given to installing new conductors so that the overloaded facilities were capable of transporting more power. However, this alternative was dismissed given the number of facilities that would need to be upgraded. Additionally, this alternative would not provide a long-term solution to the reliability issues that had been identified.

Q. Does this conclude your testimony?

A. Yes, it does.