Agenda Date: 2/11/10
Agenda Item: 2A

STATE OF NEW JERSEY

Board of Public Utilities
Two Gateway Center
Newark, NJ 07102
www.nj.gov/bpu/

ENERGY

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 (SUSQUEHANNA – ROSELAND TRANSMISSION LINE)	)	DECISION AND ORDER
	)	DOCKET NO. EM09010035

(SERVICE LIST ATTACHED)

BY THE BOARD[1]:

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[1] Commissioner Butler voted in the affirmative at the February 11, 2010 agenda meeting. He has since retired as a Commissioner and, therefore, is not executing this Decision and Order.

I. BACKGROUND/ PROJECT DESCRIPTION

Public Service Electric & Gas Company ("PSE&G," "Company," or "Petitioner") is a corporation of the State of New Jersey, and an electric utility as defined within Title 48 of the New Jersey Statutes and, as such, is subject to the jurisdiction of the New Jersey Board of Public Utilities ("Board" or "BPU"). Thus, it is responsible for ensuring safe, adequate and proper utility service to nearly three-quarters of the population of the State of New Jersey. It is also the default supplier for retail customers within its service territory and is a provider of last resort under the Electric Discount and Energy Competition Act, N.J.S.A. 48:3-49 et seq. ("EDECA"). Additionally, PSE&G is a transmission owner in PJM Interconnection, LLC ("PJM"), the regional transmission grid operator and planner, and a signatory to the PJM Consolidated Transmission Owners Agreement ("TOA").

On January 12, 2009, PSE&G filed a petition ("Petition") pursuant to N.J.S.A. 40:55D-19, requesting that the Board determine that the construction and installation of the proposed 500,000 volt ("500-kV") Susquehanna-Roseland transmission system upgrade (the "Project") is reasonably necessary for the service, convenience or welfare of the public. To these ends, PSE&G requested the Board issue an Order that the zoning, site plan review, and all other Municipal Land Use Ordinances or Regulations promulgated under the auspices of Title 40 of the New Jersey Statutes and the Land Use Act of the State of New Jersey shall not apply to the Project. Thereafter, on January 16, 2009, PSE&G amended the Petition to identify a portion of the proposed Project that would affect the Borough of Hopatcong.

According to the Petition, through its Regional Transmission Expansion Planning ("RTEP") process, PJM has determined that the Project is necessary by the summer of 2012 to retain reliability for the entire regional transmission grid, and specifically for New Jersey. More specifically, the Project was approved by PJM solely to address twenty-three (23) projected reliability criteria violations identified by PJM in its RTEP process.

As noted above, the Project consists of a new 500 kV transmission line that will extend approximately 145 miles from Susquehanna, Pennsylvania, where it will proceed southeast towards Bushkill, eventually crossing the Delaware River at the Delaware Water Gap and then proceed to New Jersey.

The New Jersey portion of the proposed route for the Project follows an existing 230 kV power line for the entire forty-five (45) mile length and will pass through sixteen municipalities. More specifically, the New Jersey portion of the line begins in Hardwick Township, Warren County, proceeds east to Andover Township, Sussex County, and on to Jefferson Township, Morris County. The route continues east to Montville Township and then turns south to Roseland Borough, Essex County. Additionally, two switching stations have been proposed. One would be in either Jefferson or Hopatcong.[2] The other would be in East Hanover or Roseland.[3] The

[2] The Board notes that, according to the Petition, this switching station would be located in Jefferson Township. By letter dated August 21, 2009, however, PSE&G notified the Board of its willingness to move construction of that switching station to the Borough of Hopatcong as part of its proposed Comprehensive Mitigation Plan submitted as an amendment to its Highlands Applicability Determination. According to the letter, that Comprehensive Mitigation Plan was submitted based upon input from the New Jersey Department of Environmental Protection ("NJDEP"), the New Jersey Highlands Council ("Highlands Council"), and the public, and the proposed relocation would not materially affect this filing.

[3] Similarly, the Petition indicated that the second proposed switching station would be located in the Township of East Hanover. By letter dated November 12, 2009, however, PSE&G notified the Board that

line will also cross approximately two miles of federal land operated by the National Park Service, freshwater wetlands, the Picatinny Arsenal, the Kittatinny Mountains, the Appalachian Trail, and the New Jersey Highlands Region.

If approved, PSE&G or one of its affiliates will build the New Jersey portion of the line, while PPL Electric Utilities ("PPL"), will build the Pennsylvania portion (approximately one hundred miles). The estimated cost to build the entire transmission line is between $900 million and $1.2 billion and the New Jersey portion is estimated to cost approximately $750 million.

II. PROCEDURAL HISTORY

On February 26, 2009, a prehearing conference was held at the Board's Newark offices to establish a procedural schedule and discuss the issues set forth in N.J.A.C. 1:1-13.2. The prehearing conference was attended by parties representing PSE&G, various municipalities, private entities including camps and schools, the Eastern Environmental Law Clinic ("Eastern"), the organization Stop the Lines! ("Stop the Lines"), the New Jersey Department of the Public Advocate, Division of Rate Counsel ("Rate Counsel"), and Board Staff.

On March 12, the Board issued a Prehearing Order establishing the procedural schedule in this matter, with evidentiary hearings set for the week of October 19, 2009. The Prehearing Order also established a schedule for the filing of a motion by certain parties for the establishment of an escrow account to be used for the purpose of paying experts for the municipalities.

On April 27, 2009, the Board issued a Procedural Order in this matter which granted the motions for intervention to: Township of Fredon, Township of Parsippany, Township of Byram, Township of Andover, Township of Hardwick, Township of East Hanover, Township of Montville, (collectively, "Municipal Intervenors"), Gerdau Ameristeel Corporation ("Gerdau"), Willow Lake Day Camp ("Willow Lake"), Fredon Township Board of Education ("Fredon BOE"), Exelon Corporation ("Exelon"), Montville Township Board of Education ("Montville BOE"), Deborah E. Kelly, Peggy Norris, David Cinnater, and the Estate of William Cinnater (collectively "Estate of William Cinnater"), Fredon Parents Against the Lines ("Fredon PALS"), Stop the Lines, and Environment New Jersey, The New Jersey Highlands Coalition, Sierra Club – New Jersey Chapter, New Jersey Environmental Federation (collectively "Environmental Intervenors"). The Board also granted the National Park Service participant status, as requested.

The April 27, 2009 Procedural Order also granted the motions for admission pro hac vice of Jodi L. Moskowitz for PSE&G, Robert A. Weishaar, Jr. and Dennis P. Jamouneau for Gerdau, and Carol A. Overland for Stop the Lines. Lastly, it designated Commissioner Joseph L. Fiordaliso as the presiding commissioner in this proceeding and authorized him to preside over evidentiary hearings, modify the procedural schedule, decide upon motions, and otherwise control the conduct of this case without further approval of the Board.

On May 13, 2009, Commissioner Fiordaliso issued an Order Amending Procedural Schedule, wherein the dates for submitting discovery were modified, but the timeframe for Board action remained the same.

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it was willing to move construction of this switching station from East Hanover to its existing switching stations located in the Borough of Roseland. To that end, PSE&G submitted several updated discovery responses reflecting any changes that would result in the alternate location.

Pursuant to the Prehearing Order, on May 14, 2009, the Board considered whether to require PSE&G to set aside funds in an escrow account to pay for experts. On May 29, 2009, the Board issued an Order Denying Motions to Require PSE&G to Place Funds in an Escrow Account memorializing the action taken at the May 14, 2009 agenda meeting. It is the Board's understanding, however, that PSE&G did reach an agreement with certain parties to place funds aside in escrow to assist those parties in paying for experts in this matter.

A. Public Hearings

Three public hearings were held in this matter before Commissioner Fiordaliso, after proper notice, at the following dates and times:

1) June 11, 2009, 7:00 pm, Sussex Community College Theater, Newton, New Jersey;
2) June 18, 2009, 7:00 pm, Sussex Community College Theater, Newton, New Jersey; and
3) June 30, 2009, 7:00 pm, Frelinghuysen Arboretum, Morristown, New Jersey.

Each public hearing lasted until approximately 11:00 pm and hundreds of individuals were given the opportunity to express concerns or support for the proposed Project. The majority of the commenters at each public hearing were opposed to the Project. Major opposition was primarily based on: health and safety issues related to electromagnetic fields ("EMF"), aesthetic concerns, property value concerns, and environmental concerns. Those in support primarily based that support on reliability and economic concerns. The oral and written comments submitted have become part of the record and have been considered in this review.

On July 29, 2009, PSE&G filed a motion to strike the pre-filed direct testimony of Steven Balzano, a witness on behalf of the Municipal Intervenors. After obtaining consent for an extension, the Municipal Intervenors submitted a response to the Motion to Strike on August 14, 2009. The Board notes that this motion was deemed moot after the Municipal Intervenors withdrew the direct testimony of Steven Balzano.

B. Site Visit

After notice and invitation to the parties, on August 13, 2009, Commissioner Fiordaliso conducted site visits at three locations along the proposed route of the Project: 1) Delaware Water Gap Natural Resource Area, Millbrook Village, New Jersey, 2) Fredon Township School, Fredon, New Jersey, and 3) Lurker Park, East Hanover, New Jersey.

Board Staff, counsel representing Board Staff and the Board, Rate Counsel, and representatives of PSE&G attended the site visits in each location. Additionally, representatives of the National Park Service and the Mayor of Hardwick, New Jersey attended the Millbrook Village site. Representatives of the Fredon School District and the Fredon PALS attended the site visit at the Fredon Township School. Lastly, the Mayor and Township Administrator of East Hanover, as well as other East Hanover Township representatives, the Mayor of Parsippany, and the Mayor of Hanover all attended the last site visit at Lurker Park.

On September 1, 2009, Commissioner Fiordaliso issued a Site Report detailing the observations he made at each of the site visits.

On August 21, 2009, in conformance with the Comprehensive Mitigation Plan submitted by PSE&G as an amendment to its Highlands Applicability Determination, which was voted on and approved by the New Jersey Highlands Council, PSE&G submitted a letter notifying the Board

that it was willing to move the construction of a new switching station from Jefferson Township to the Borough of Hopatcong, New Jersey.

On September 10, 2009, Commissioner Fiordaliso issued a Modified Scheduling Order based upon the need for a complete and full record in this matter. That order extended the time to file discovery requests and responses, and it also moved evidentiary hearings to November 16, 2009.

On September 16, 2009, the Fredon PALS filed a Notice of Withdrawal with the Board. On September 17, 2009, the Fredon BOE filed a Notice of Withdrawal with the Board.

On October 20, 2009, the Municipal Intervenors filed a motion to compel discovery with the Board. On November 5, 2009, the Municipal Intervenors withdrew this motion.

On November 6, 2009, council for the Municipal Intervenors filed a motion to dismiss PSE&G's petition on behalf the Municipal Intervenors, the Environmental Intervenors, and Stop the Lines ("November 6 Motion to Dismiss"). On November 11, 2009, after the issue of timeliness of the motion was raised, the Intervenors filed a "clarifying letter" indicating that the motion could be considered a motion to dismiss or, in the alternative, a motion for emergency relief.

On November 9, 2009, after notice to the parties, a second prehearing telephone conference took place to discuss issues relating to the hearings which were to commence on November 16, 2009. On that call the parties agreed that all pre-filed testimony would be stipulated into the record; that the parties would provide four copies of pre-filed testimony at the hearing; that, unless the parties agreed otherwise, all discovery would need to be introduced and moved into evidence on an individual basis; and that counsel for each party will be given the opportunity to make brief opening statements. Lastly, the parties agreed that PSE&G would present its witnesses by panel in the following order: 1) routing, 2) construction/engineering, 3) need, and 4) EMF.

C. Discovery and Pre-Filed Testimony

Discovery was issued and responded to pursuant to the procedural schedule issued by the Board on March 12, 2009, and modified thereafter by Commissioner Fiordaliso. Discovery was propounded by PSE&G, Board Staff, Rate Counsel, the Municipal Intervenors, the Environmental Intervenors, the Montville BOE, and Stop the Lines. In all, there were approximately 1650 data requests and responses with the large majority of the requests directed to PSE&G.

Similarly, pre-filed direct and rebuttal testimony was filed with the Board pursuant to Commissioner Fiordaliso's March 12, 2009 Order, as modified thereafter. More specifically, however, pre-filed direct testimony was submitted by the following:

1) PSE&G (direct testimony filed along with Petition on January 12, 2009):

    a. John P. Ribardo, Manager, Transmission Projects in the Delivery Projects & Construction Department of PSE&G;
    b. Robert Pollack, President of Environmental Resource Consulting, LLC;
    c. Robert L. Gibbs, formerly Manager – PSE&G Corporate Properties;
    d. Jack Halpern, Project Director for the Louis Berger Group;

e. Richard Jacober, Project Manager for Black and Veatch's Power Delivery Business Line;
f. Robert Millies, a High Voltage Transmission Line Design Project Manager for Commonwealth Assocaites, Inc.;
g. Richard F. Crouch, Senior Project Manager, Transmission Outside Plant Construction PSE&G;
h. Steven R. Herling, Vice President of Planning for PJM;
i. Paul F. McGlynn, Manager PJM Transmission Planning Department;
j. John M. Reynolds, Senior Economic Analyst in the Capacity and Adequacy Planning Department of PJM;
k. Esam A. F. Khadr, Director, Electric Delivery Planning of PSE&G;
l. Kyle G. King, President of K&R Consulting; and
m. William H. Bailey, PhD., Principal Scientist and Director of Exponent, Inc.

2) Municipal Intervenors:

a. Benjamin K. Sovacool, PhD., Research Fellow in the Energy Governance Program at the Centre on Asia and Globalisation, Assistant Professor at the Lee Kuan Yew School of Public Policy at the National University of Singapore, and Adjunct Assistant Professor at the Virginia Polytechnic Institute & State University in Blacksburg, Virginia; and
b. Steven Balzano, President of Environmental Strategies Inc.[4]

3) Stop the Lines: Helene Jaros, Controller of Residential Home Funding Corporation.

4) Willow Lake: Martin Blank, PhD., Associate Professor of Physiology and Cellular Biophysics at the College of Physicians and Surgeons, Columbia University.

Thereafter, and in accordance with the procedural schedule as modified, on September 2, 2009, PSE&G submitted pre-filed rebuttal testimony of John M. Reynolds, William H. Bailey, Esam A.F. Kadhr, Steven R. Herling, Paul F. McGlynn, Richard Franklin, and Kyle G. King.[5]

D. Evidentiary Hearing[6]

After a series of efforts to modify the hearing schedule, evidentiary hearings in this matter commenced on November 16, 2009 in the Board's hearing room in Newark. The hearing was presided over by Commissioner Fiordaliso and was attended by representatives of the Petitioner, the Municipal Intervenors, the Montville BOE, the Environmental Intervenors, Stop the Lines, Exelon, Rate Counsel, and Board Staff.

[4] As indicated above, PSE&G filed a motion to strike this testimony. Thereafter, the Municipal Intervenors withdrew the pre-filed direct testimony of Steven Balzano. Commissioner Fiordaliso confirmed this withdrawal during his opening remarks of the evidentiary hearing on November 16, 2009.
[5] In his rebuttal testimony, Richard Franklin adopted the pre-filed testimony of Robert L. Gibbs. Thus, Mr. Franklin testified at the hearings, wherein he again adopted the testimony of Mr. Gibbs.
[6] Transcripts of the evidentiary hearings will be identified in this Order as follows:
1T = November 16, 2009 hearing;
2T = November 18, 2009 hearing;
3T = November 19, 2009 hearing;
4T = November 20, 2009 hearing;
5T = November 23, 2009 hearing.

As an initial note, because the November 6 Motion to Dismiss was not timely and, in any event, the parties did not have an opportunity to respond prior to the evidentiary hearings, Commissioner Fiordaliso indicated in his opening remarks that the motion would be held in abeyance and that, should the parties wish to re-file it at the end of hearings, they could do so.[7]

Additionally, all of the pre-filed testimony in this matter was stipulated into the record by the parties at the hearing.

PSE&G produced thirteen witnesses in four panels:

1) ROUTING

    a. John P. Ribardo, Manager, Transmission Projects in the Delivery Projects & Construction Department of PSE&G;
    b. Robert Pollack. President of Environmental Resource Consulting, LLC;
    c. Richard Franklin, Manager – Corporate Properties; and
    d. Jack Halpern, Project Director for the Louis Berger Group;

2) CONSTRUCTION / ENGINEERING

    a. Richard Jacober, Project Manager for Black and Veatch's Power Delivery Business Line;
    b. Robert Millies, a High Voltage Transmission Line Design Project Manager for Commonwealth Associates, Inc.; and
    c. Richard F. Crouch, Senior Project Manager, Transmission Outside Plant Construction PSE&G

3) NEED

    a. Steven R. Herling, Vice President of Planning for PJM;
    b. Paul F. McGlynn, Manager PJM Transmission Planning Department;
    c. John M. Reynolds, Senior Economic Analyst in the Capacity and Adequacy Planning Department of PJM; and
    d. Esam A. F. Khadr, Director, Electric Delivery Planning of PSE&G;

4) EMF

    a. Kyle G. King, President of K&R Consulting; and
    b. William H. Bailey, PhD., Principal Scientist and Director of Exponent, Inc.

The Municipal Intervenors produced two witnesses[8]:

1) Christopher Cooper, Principal Partner of Oomph Consulting, LLP[9]; and

[7] At the close of evidentiary hearings, it was again noted that the parties could re-file this Motion if they wished, but they declined to do so. The Board notes that the Intervenors did file a new Motion to Dismiss on January 29, 2010, which is discussed below.

[8] As noted above, during the November 9, 2009 prehearing conference, counsel for the Municipal Intervenors withdrew the pre-filed direct testimony of Steven Balzano. Commissioner Fiordaliso confirmed this withdrawal during his opening remarks of the evidentiary hearing on November 16, 2009.

2) Martin Blank, PhD., Associate Professor of Physiology and Cellular Biophysics at the College of Physicians and Surgeons, Columbia University.[10]

Stop the Lines produced one witness:

1) Helene Jaros, Controller of Residential Home Funding Corporation.

Over the course of five days of hearings, all of the parties had an opportunity to cross-examine each of these witnesses, and the parties that produced witnesses had the opportunity for re-direct examination and re-cross-examination. At the close of hearings, a post-hearing briefing schedule was discussed and agreed upon by the parties, with anticipated Board action on January 15, 2009.

E. Supplemental Evidentiary Hearing[11]

On January 7, 2010, presiding Commissioner Joseph L. Fiordaliso advised the parties that he intended to take official notice of documents relating to the Potomac Appalachian Transmission Highline ("PATH") project and gave the parties until January 15, 2010 to respond.

On January 8, 2010, PSE&G submitted a request to change this deadline to January 12, 2010. Also on January 8, the Municipal Intervenors and Stop the Lines submitted their opposition to PSE&G's request. On January 11, 2010, the Municipal Intervenors provided a further response in opposition to PSE&G's request, and the Environmental Intervenors and the Montville BOE expressed their support of the Municipal Intervenors' response.

Nevertheless, PSE&G consented to the inclusion of these items, and also advocated for a shortening of the time to respond. On January 12, 2010, Commissioner Fiordaliso granted PSE&G's request in part and amended the deadline for submissions in response to 4:00 p.m. on the afternoon of Thursday, January 14, 2010. At that time, Commissioner Fiordaliso also advised the parties of his intention to take official notice of the January 8, 2010 letter from Pepco Holdings, Inc. to the Maryland Public Service Commission in Case No. 9179 and the PJM January 8, 2010 letter to Pepco Holdings, Inc. Each of these documents related to the Mid-Atlantic Power Pathway ("MAPP") project.

At its January 15, 2010 agenda meeting, the Board ordered that each of the documents be made part of the record in this proceeding, along with each of the parties' comments.

The Board also authorized that a Board Secretary letter be issued to PJM requesting additional information.

Lastly, the Board ratified Commissioner Fiordaliso's January 13, 2010 Order denying the parties requests for oral argument without prejudice.

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[9] Due to scheduling conflicts, Benjamin K. Sovakool, PhD., the witness for the Municipal Intervenors that sponsored pre-filed direct testimony, was unavailable for evidentiary hearings. Therefore, his associate, Christopher Cooper, sponsored his testimony and adopted it.

[10] At the November 10, 2009 prehearing conference, the Municipal Intervenors indicated that they would be sponsoring the testimony of Martin Blank, PhD.

[11] Transcript of the February 4, 2010 Supplemental evidentiary hearing will be identified as 6T.

After receiving a letter in response to the Board Secretary's letter from Steven R. Herling, wherein he reaffirmed his previous testimony in this matter that the Project is needed, Commissioner Fiordaliso scheduled a supplemental evidentiary hearing on the issues related to his response.

On February 4, 2010, a one-day supplemental hearing took place, where all of the parties were given an opportunity to cross-examine Mr. Herling on the issues raised in his response. Additionally, the Municipal Intervenors were given the opportunity to put on their expert need witness to refute Mr. Herling's testimony, but they declined to do so.

F. Post-hearing Motions

On January 24, 2010, the Municipal Intervenors filed a second motion with the Board requesting that an escrow fund be established for additional funds to assist the municipalities. PSE&G responded to the motion, and the Municipal Intervenors submitted a reply. On February 1, 2010 for the same reasons that the initial Motion requesting an escrow account was denied by the full Board, Commissioner Fiordaliso issued an Escrow Funding Order denying the motion.

Similarly, in response to several intervenors attempts to conduct discovery and to depose Mr. Herling's concerning his responsive letter to the Board, on February 1, 2010, Commissioner Fiordaliso issued a Discovery Order, wherein he denied the parties attempts to conduct written discovery or to depose Mr. Herling. Additionally, although he did not explicitly take judicial notice of two documents requested by the Environmental Intervenors, he did state the parties ability to reference them.

On January 28, 2010, the Municipal Intervenors filed a Motion to Dismiss and Stay this proceeding because of the current status of the cost allocation scheme at the FERC. The motion was joined by the Montville BOE, and the Environmental Intervenors and opposed by PSE&G.

At the close of the supplemental evidentiary hearing, the Muncipal Intervenors also made a verbal request for oral argument before the Board.

III. TESTIMONY PRESENTED

A. The Need for the Proposed Project

Esam A. F. Khadr, Director – Electric Delivery Planning in the Electric Delivery Department of PSE&G submitted testimony in support of the need for the construction of the transmission line and the associated switching stations. He stated that the switching stations are integral to the entire project: the Jefferson/Hopatcong switching station loops into the existing 500kV Branchburg-Ramapo circuit to ensure redundancy of the 500kV network and that the Roseland/East Hanover switching station will furnish a strong 500kV source of supply into Roseland, thereby relieving an overload condition. It will also act as a supply source that will back feed and strengthen the northern Jersey Central Power & Light Company ("JCP&L") system.

Mr. Khadr also testified regarding the nature and objectives of reliability planning and the variety of negative effects transmission line overloads can have on a system. With that understanding, Mr. Khadr testified that North American Electric Reliability Corporation ("NERC") reliability standards require PJM to test events which fall into three (3) categories: A, B and C. NERC

Category A criteria require ratings and system voltage limits to be respected and for the system to be stable. NERC Category B criteria impose similar requirements, but with one facility removed from service (referred to "n minus 1" criteria). Finally, NERC Category C criteria impose requirements in situations involving second contingencies – i.e. the loss of a second system element (referred to as "n minus 2" criteria). Mr. Khadr testified that these NERC reliability standards were the "criteria" used to determine that this Project was needed to maintain reliability. He testified that the NERC reliability standards require PJM to identify the "critical system conditions" that the system must be evaluated against to ensure the system meets the performance criteria specified in these standards and that when these tests show an inability of the existing transmission system to meet a specific reliability standard or standards under these conditions, construction of additional transmission becomes necessary.

Mr. Khadr then went on to testify as to the Load Deliverability Study and the Generation Deliverability Study, which are the types of tests used by PJM to determine if transmission system upgrades are necessary. Both types of studies are conducted by simulating the transmission system as it is expected to exist during future time periods. The simulations include expected load growth, the addition of new generating plants and the retirement of existing generation plants, the addition of merchant transmission projects, as well as planned transmission construction projects. The simulations are performed within the context of peak periods, modeling the conditions when the transmission system will be most stressed and during which there will be inadequate generation that can be re-dispatched to satisfy the demands of load.

Mr. Khadr testified that PJM's planning process is collaborative and provides an open and inclusive forum for participation by all classes of market participants and stakeholders. Through the RTEP, PJM evaluates the aggregate of all needs across its system, identifying potential problems on both a local and regional level. By identifying future problems on a regional basis, PJM is able to identify the most effective regional solutions and minimize the impacts associated with focusing on state and transmission owner boundaries. The RTEP uses a baseline power case that models expected future system conditions, including existing transmission, generation and demand-side resources, as well as new transmission, generation and demand response that is reasonably certain to exist. Mr. Khadr testified that the result is a single process that integrates many system factors and requires PJM to make initial forecasting assumptions which are updated annually to reflect changes. PJM then works with affected transmission owners to develop specific transmission solutions that are needed to remedy identified reliability violations.

Proposed projects are then publicly presented and discussed at PJM's Transmission Expansion Advisory Committee ("TEAC") and submitted to PJM's Board of Managers for review. If the project is approved by the PJM Board of Managers, PJM designates a transmission owner(s) as having construction and ownership responsibility. PJM then reviews its RTEP baseline assumptions, with respect to generation retirements and additions, load forecasts, demand response forecasts and changes in transmission topology, on an annual basis. PJM also reviews the need for each project identified in the RTEP on an annual basis, which is called a "retool."

For this Project, PJM identified numerous reliability criteria violations that are projected to occur beginning in 2012 when using a 5-year "look-ahead," and then identified additional violations when examining years 6 through 15 as part of PJM's 15-year planning horizon. Mr. Khadr stated that PJM and the affected transmission owners then worked together to determine which viable solutions and/or alternatives existed to address the identified reliability criteria violations. Mr. Khadr testified that PSE&G and PPL were obligated to construct the Project once it was

approved by the PJM Board of Managers. He further stated that PSE&G received a notice that it had been designated to build the New Jersey portion of the Project on October 9, 2007 and that PSE&G is required to construct the Project or make arrangements to have another transmission owner member construct the Project according to the Transmission Owners Agreement.

Mr. Khadr testified that he reviewed PJM's RTEP studies and agreed that the Project will address the reliability violations and that it will provide the best solution from reliability and planning perspective. He stated that there would be overloaded circuits beginning in the year 2012 if the Project is not placed into service, which would likely cause PJM and the transmission owners to implement emergency operating procedures, such as reducing transmission system voltages ("brown-outs") or implementing rolling black-outs for network transmission service customers.

Mr. Khadr believes the Project will deliver a mix of generation sources, noting that wind generation currently makes up approximately 47% of PJM's interconnection queue, which represents potential future generation, and natural gas-fired generation comprises approximately 35% of the interconnection queue.

Mr. Khadr then testified that the Branchburg-Roseland-Hudson transmission line project would be built to address different PJM-identified reliability criteria violations, with no overlap with this Project. He also opined that the Project is not being constructed to move power from New Jersey into New York and that energy flows in both directions between PJM and New York.

Mr. Khadr believes that alternatives to the line, including generation, demand response, and lower voltage transmission lines are insufficient to address the identified reliability violations because PJM already models assumptions regarding generation in its RTEP planning analysis, and construction and/or retirement of generation is a market-driven process that PJM cannot mandate. Mr. Khadr also stated that it is difficult to site and build local generation in densely populated like eastern PJM.

Mr. Khadr testified that PJM could look to develop and implement "band-aid" projects, such as lower voltage transmission projects, as a means of addressing a small sub-set of system overloads for a short period of time, but that such lower voltage transmission fixes will not address all of the identified violations. Operational procedures to address the overloads would still be required, and the unresolved reliability criteria violations would place the system at risk and greatly increase the possibility that customer load will need to be curtailed in order to prevent uncontrolled system blackouts. He claims that lower voltage transmission projects have been rejected in the RTEP as not being robust enough to address all of the identified reliability criteria violations.

Mr. Khadr testified that PSE&G's summer peak load has increased at a 1.6% rate over the past five years (9855 MW in 2003 to 10,654 MW in 2008 or 800MW). In 2006, PSE&G experienced an unrestricted peak load of 11,229 MW. Mr. Khadr testified that if PSE&G were to experience the same weather conditions in the summer of 2012, coupled with only a 1% growth rate, the 2012 summer peak load would exceed PJM's 2008 Load Forecast Report for 2012.

Mr. Khadr testified that the 2009 Load Forecast Report might show smaller load growth rates for both New Jersey and for the PJM region as a result of the economic downturn but that off-setting inputs into the planning analysis may offset the slower load growth and could even suggest a more immediate need for the Project. Additionally, he claimed that an economic-

driven slow-down in energy usage may not produce a corresponding reduction in peak load demand during extreme weather conditions. Mr. Khadr testified that, even if load growth slows over the next year or two, the need for this Project will remain given the number and severity of the identified reliability criteria violations at issue. Nonetheless, said Mr. Khadr, PSE&G will adhere to PJM's determination if PJM concludes that the Project is not needed or should be delayed.

Mr. Khadr testified that working demand response programs will not negate the need for the construction of the Project. Mr. Khadr stated that PJM can only model demand response programs that are in place and thus certain, measurable and verifiable. He opined that the goals of the New Jersey Energy Master Plan ("EMP") may or may not be achieved and, thus, cannot be included in PJM's planning process. Mr. Khadr also testified that demand side programs cannot realistically substitute for new transmission capacity to customers in eastern PJM because demand response does not produce a steady stream of megawatt ("MW") output equivalent to generation, as it is typically cycled over a given period of time.

Mr. Khadr testified regarding the source of the line loading estimates that he provided to PSE&G expert Kyle G. King. He estimated hourly power flows on transmission circuits along the ROW before and after construction of the Project. Mr. Khadr stated that Mr. King used these hourly power flow values to calculate magnetic field levels on all circuits along the route of the Project in New Jersey. Mr. Khadr explains that two different methods were used. First, historical data was used to describe the hourly power flow on the existing 230 kV circuits, and to analyze how this would change if the proposed 500 kV and the reconfigured 230 kV circuits along the New Jersey portion of the proposed ROW were operating in 2006-08. The second method used a production cost algorithm with a transmission modeling tool to predict the hourly flow for the year 2013 on the existing 230kV circuits and then on the proposed 500 and 230 kV circuits along the New Jersey portion of the Project. Mr. Khadr stated that the hourly flows estimated by both methods were used by Mr. King to calculate magnetic field levels.

In rebuttal, Mr. Khadr testified that PJM determined the need for the Project and that Mr. Sovocool is inaccurate in suggesting that PSE&G was responsible for identifying the need for the Project. He testified that many inputs, including but not limited to load projections, are used to identify reliability criteria violations, and that Mr. Sovocool assumed load projection reductions without addressing all of the other inputs. These inputs include generation additions, generation retirements, merchant transmission projects, changes to planned baseline upgrades, firm power transactions, demand response, and energy efficiency that have bid and cleared the RPM auctions.

In rebuttal, Mr. Khadr also claimed that the delays and changes in the MAPP and PATH projects underscore the validity, credibility and independence of the PJM planning process. With respect to demand response, Mr. Khadr testified that it cannot displace the need for the Project because it cannot resolve category C double circuit tower line contingencies, there is not enough demand response to address the remaining category B contingencies, and demand response resources may or may not be available from year to year.

Mr. Khadr testified that solar photovoltaic projects cannot serve as a substitute for investments in transmission infrastructure. Mr. Khadr also testified that PJM has not over relied on transmission solutions but that it orders transmission solutions only when other market solutions do not materialize.

With respect to reactive power, Mr. Khadr testified that the Project will not increase the risk of voltage instability and in fact, this Project will add an additional 250 megavolt ampere reactive ("MVARs") of charging, which is equivalent to adding capacitors to the line. Additionally, the Project will reduce the flow on other circuits, thereby reducing line losses and total system losses. Lower losses and additional charging will increase voltage on the system, providing the system with higher reactive output from existing static sources.

In rebuttal, Mr. Khadr testified that PJM and PSE&G have considered alternatives to the Project, such as the smaller transmission solutions previously identified. Non-transmission solutions are also included as they respond to the market.

He also testified that the Bergen 2 unit is committed to the 2012/2013 RPM capacity auction, and PSE&G has currently withdrawn the deactivation request of this unit from the PJM queue.

Steven R. Herling, Vice President of Planning for PJM, also submitted testimony in support of the need for the construction of the Project. Mr. Herling's testimony begins with a description of PJM, where he testified that PJM is an RTO that ensures the reliability of the electric transmission system under its functional control and coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. Mr. Herling stated that the PJM system serves approximately 51 million customers and dispatches more than 164,000 MW of generation capacity over more than 56,000 miles of transmission lines – a system that serves nearly 20 percent of the United States economy.

Mr. Herling testified that PJM prepares an RTEP each year in order to analyze the electric supply needs of the customers in the PJM region. Through this process, PJM evaluates its system, identifying potential problems on both a local and regional level. He testified that by identifying problems on a regional basis, PJM is able to determine the most effective regional solutions that ignore state and transmission owner boundaries. The RTEP directs transmission upgrades to address needs within five years and longer term needs of fifteen years. This information is publicly disseminated through the RTEP and permits other resource providers, including generators, demand response, and merchant transmission the opportunity to address identified system needs in a manner that might delay or even obviate the transmission solution first identified in the RTEP.

Mr. Herling testified that PJM coordinates its planning processes with neighboring systems, including the Midwest Independent Transmission System Operator, the Independent System Operator of New England, the New York Independent System Operator, the Tennessee Valley Authority, Progress Energy and Duke Energy. The RTEP process provides the opportunity for involvement of others outside of the PJM organization. For example, the TEAC reviews and provides input on the scope and assumptions of RTEP studies, including economic/market efficiency analysis; RTEP analysis at defined points during the RTEP process cycle; RTEP recommendations to be proposed to the PJM Board for endorsement; and Specified RTEP process matters as requested by the PJM Board.

Mr. Herling testified that PJM is designated by NERC as the Planning Authority and the Transmission Planner with respect to compliance with the NERC standards. As such, PJM applies reliability criteria to evaluate transmission system conditions and then develops the transmission solutions needed to ensure compliance with NERC Reliability Standards.

Mr. Herling next describes the PJM transmission planning process. Mr. Herling testifies on the elements of PJM's planning process, which include: forecasted load growth, demand-side-response efforts and distributed generation additions, interconnection requests by developers of new generating resources and merchant transmission facilities, solutions to mitigate persistent congestion and forward-looking economic constraints to ensure adequate allocation and funding of long-term financial transmission rights, assessments of the potential risk of aging infrastructure, long-term firm transmission service requests, generation retirements and other deactivations, transmission owner-initiated improvements, and load-serving entity capacity plans.

Mr. Herling next describes the role of FERC and NERC. NERC standards became mandatory pursuant to the Energy Policy Act of 2005 and that failure to comply with such standards can result in fines of up to $1million per day. The Project is the result of PJM's Federally-mandated efforts as an RTO to identify and attempt to resolve transmission reliability issues. NERC requires solutions to identified projected reliability criteria violations.

Mr. Herling testifies that PJM's Consolidated TOA requires transmission owners to build transmission facilities approved by the PJM Board that are needed to meet reliability standards.

Mr. Herling testifies that PJM performs a five-year and fifteen-year baseline analysis to assess compliance with reliability criteria and that there were 23 violations identified in the 2007 RTEP. PJM's 15 year planning horizon permits the consideration of many long lead time transmission options and is intended to address long-term load growth, the impacts of generation retirements and the delivery of clustered generation. The near term and long term violations combined constitute the justification for the construction of the Project.

Mr. Herling explains that as the transmission system conditions change, PJM changes its assumptions, which may impact the timing and severity of the violations. Mr. Herling lists the changes in the RTEP that have occurred since June 2007 up until the filing of the Petition and states that changes are likely to continue to occur after the completion of the 2008 RTEP. Mr. Herling testifies that it remains prudent to move forward with a project of this magnitude in the face of changing conditions because the PJM transmission system is rapidly reaching the point where short-term, incremental fixes will no longer be sufficient to mitigate identified reliability criteria violations.

Mr. Herling testifies that a 500kV Bossards-Jefferson-Roseland alternative and a 230kV Stanton-Roseland alternative were also evaluated but that the Project had the greatest positive impact on the projected violations. Non-transmission solutions were also included as market-driven additions, but PJM considers it unlikely that these solutions can be implemented to offset the projected reliability violations because PJM does not have the authority to compel alternative solutions in the deregulated electric industry. PJM's planning processes recognize that many non-transmission alternatives, if targeted, verifiable, and implemented on time and in the right areas of the PJM region can address reliability issues. PJM does not conduct "integrated resource planning" in the traditional sense of the term, but PJM's planning process examines all needs with respect to transmission solutions as well as solutions proposed through the marketplace.

Mr. Herling testifies that only generation that has cleared a Reliability Pricing Model ("RPM") auction or that has signed an Interconnection Service Agreement ("ISA") is modeled as being in service in the RTEP. Only 12% of the MW of the proposed generation in PJM are eventually connected to the PJM system. Merchant transmission projects are modeled in the RTEP after

they sign an ISA. Demand response is modeled in the RTEP when it clears the RPM auction. The Project is not designed to deliver any specific generator or type of generators to specific groups of PJM customers. Mr. Herling testifies that 47% of the generation in the PJM interconnection queue is wind and that 35% of the generation in the PJM interconnection queue is natural gas fired.

In rebuttal, Mr. Herling testifies that Dr. Sovacool makes several errors in his testimony, including the anticipated peak load growth for 2008, comparing unrestricted load to forecasted load and normalized load, and stating that the 2008 RTEP relied on the 2007 Load Forecast Report instead of the 2008 Load Forecast Report. PJM has recognized demand response for decades, and has included it in the RTEP process since 1999. The RTEP has confirmed the need for the Project three times, even with the wide range of changing system conditions since 2007. The number and severity of violations is a function of projected load and a number of other inputs and that PJM has continually used the most updated projected load data in its analysis.

Also in rebuttal, Mr. Herling testifies that the additional resources that cleared the May 2009 RPM Auction ("May 2009 Auction") may or may not delay the onset of load deliverability criteria violations but any delay would only be one or two years. The May 2009 Auction resources that cleared will have no impact on the NERC Category C criteria violations. Many of the energy efficiency programs contemplated for future implementation in PJM are far too uncertain to rely on, and to rely on those would be inconsistent with the PJM stakeholder-approved process. It would also jeopardize reliable service to customers within PJM. Mr. Herling then describes various uncertainties surrounding generation, demand response, and energy efficiency. Since 2003, 5862 MW of generation has retired and 7500 MW of generation is over 40 years old in the eastern Mid-Atlantic area of PJM. The risk of retirement for some of this generation is very high based on unit age, environmental restrictions, reduced revenue streams, and limited operation. PJM considers demand response and conservation as part of the solutions set, but they are not a substitute for a reliable transmission system.

Paul F. McGlynn, Manager of Transmission Planning for PJM, also submitted testimony in support of the need for the construction of the Project. Mr. McGlynn describes the RTEP as PJM's analytical approach to identify transmission system upgrades and enhancements to preserve the reliability of the electricity grid. PJM used the mandatory NERC planning reliability standards to determine that the Project is needed to prevent electric reliability problems from occurring.

Mr. McGlynn described the NERC category A, B, and C criteria, the PJM load deliverability test and the PJM generation deliverability test. PJM models generators that have executed a Facilities Study Agreement in its RTEP as contributing to generator deliverability problems but PJM does not model generators to relieve system problems until they have executed an ISA.

Mr. McGlynn explained that he sponsored exhibit PFM-1. The results of the generation deliverability and load deliverability tests performed found 23 potential reliability criteria violations. Mr. McGlynn described the reliability violations, including a description of the location of the violations by service territory that were listed in PFM-1. Reliability 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. New or upgraded transmission lines, new generation, or demand response located in load pockets must be constructed or implemented before reliability problems occur.

Mr. McGlynn testified that transmission line overloads can cause catastrophic power outages and permanent damage to the transmission infrastructure. Immediate operator action must be taken before the transmission line or related equipment fails or is permanently damaged but such action is for emergency or temporary use only.

Mr. McGlynn testified that reliability violations were identified in multiple Pennsylvania and New Jersey transmission zones. Consumer demand in the Eastern Mid-Atlantic area is one of the main factors causing the electrical need for the Project.

Mr. McGlynn testified that consideration was given to a 500kV Bossards to Jefferson to Roseland alternative; a 230kV Stanton to Roseland alternative and the installation of new conductors but that PJM recommended the construction of the Project because it was the most effective at resolving the multiple reliability violations identified.

In rebuttal, Mr. McGlynn sponsored two exhibits, PFM-2 and PFM-3. Mr. McGlynn testified that the 2009 RTEP analyses continue to show the need for the Project by 2012. Mr. McGlynn testified as to the different assumptions between the analysis used in 2008 to that used in the 2009 RTEP. The 2009 load forecast and updated assumptions based on the 2011/12 base residual auction held in May 2008 were used in the 2009 RTEP. The updated violations included thirteen single contingency events and ten thermal violations due to the loss of two lines that are on a common structure. Mr. McGlynn described these circuits, where the violations would occur, and the expected overload dates.

John M Reynolds, Senior Economic Analyst for PJM, also submitted testimony in support of the need for the construction of the Project and sponsored the following exhibits: PJM Load/Energy Forecasting Model White Paper (Exhibit JMR-1); PJM Manual 19 Load Forecasting and Analysis (Exhibit JMR-2); The Brattle Group's review of the PJM load forecasting model (Exhibit JMR-3); and the 2007 PJM Load Forecast Report (Exhibit JMR-4).

He described that the PJM load forecasting model produces estimates of the monthly unrestricted peak loads of eighteen PJM zones, selected Locational Deliverability Areas ("LDAs") and in all of PJM. The load forecast report contains fifteen years of forecasted annual summer and winter peaks. PJM adopted several recommendations of the Brattle Group regarding the load forecast. PJM supplies the load forecast to the two NERC regions that include the PJM zones; ReliabilityFirst and the SERC Reliability Corporation.

Mr. Reynolds testified that demand side management was treated as an explicit adjustment to the unrestricted load forecast and that energy efficiency gains were included in the PJM load forecasting methodology to the extent that they impacted the rate of historic load growth. PJM will consider demand side and conservation initiatives that PJM can determine to a degree of specificity and certainty that the impacts can be achieved.

Mr. Reynolds testified that the PPL zone is projected to have a summer peak growth of 1.5% a year while the PSE&G zone is projected to have a summer peak growth of 1.4% per year. PJM expects the 2009 Load Forecast Report to show lower summer peak loads for all zones and LDAs for the years 2009 through 2011. PJM expects loads to rebound to levels that approximately one to two percent lower than the loads in the 2008 Load Forecast Report for the years 2012 through 2016.

In rebuttal, Mr. Reynolds testified that due to the large uncertainty surrounding the impact of weather on peak loads, utility forecasters typically forecast peak loads at average peak day

weather conditions, then normalize the load after the fact. In response to Dr. Sovacool, Mr. Reynolds testified that some of the suggestions made by the Brattle Group were never demonstrated to reduce forecasting errors and that PJM's forecasting error for 2006 was -1.04%. Furthermore, PJM adopted many of the Brattle Group recommendations.

He also argued that PJM's load forecast models relate the magnitude of peak load at a point in time to the magnitude of a host of variables, and do not analyze historical load growth rates in the traditional sense. However, PJM does consider load data from 1998 onward in the development of the load forecast, but without focusing on load growth rates. The amount of load management in the load forecast is not a product of the load forecast model, but an assumption that is developed separately.

Benjamin K. Sovacool, PhD., Research Fellow in the Energy Governance Program at the Centre on Asia and Globalisation, Assistant Professor at the Lee Kuan Yew School of Public Policy at the National University of Singapore, and Adjunct Assistant Professor at the Virginia Polytechnic Institute & State University in Blacksburg, Virginia, submitted testimony in opposition to Project, stating primarily that it was not needed. Dr. Sovacool argued that unanticipated reductions in electricity demand make the Project unnecessary. He stated that the original rationale for the Project was based on an anticipated 4 % increase in peak demand in 2008, but points to statistics that reveal a lower peak demand; including that peak was actually 7.8% lower in 2008 than it was in 2007. Dr. Sovacool stated that the declining peak demand has continued in 2009 and that the current economic downturn has contributed to the overall reduction.

Dr. Sovacool stated that PSE&G's most recent load forecasts project decreased consumer demand even before taking into account the substantial reductions in electricity consumption expected as a result of the Board's incentives for combined heat and power projects, microturbines, demand-response, or the New Jersey Clean Energy Program's Pay for Performance program. Dr. Sovacool further stated that PJM has also projected a 4,929 MW decrease in projected electric load for the region in the 2011 timeframe. He believes that it is too risky to use New Jersey ratepayer funds on inherently uncertain economic forecasts and PJM's assumption that a financial recovery beginning in 2010 will induce a return to pre-recession levels of electricity consumption.

Dr. Sovacool points to the MAPP transmission project as an example of a project that has been delayed and/or abandoned based on near-term reductions in consumer demand and recent economic downturns. He stated that economic considerations, rather then reliability concerns, are driving PJM's decision to proceed with the Project. He also testified that overbuilding at this time would burden New Jersey ratepayers and commit the State when much is changing in energy planning, development, and use. Additionally, he argued that the unexpected drop in electricity is widespread, and may be indicative of a permanent shift in consumption rather than a byproduct of the economic downturn. He pointed to areas of the country where consumption dropped even though prices were flat or declining, and notes that some companies are questioning whether infrastructure is even needed at this time.

Dr. Sovacool stated that the data used by PJM to determine that the line is necessary is outdated and that it does not consider reduced consumption due to the recession or efforts by the Board and others to reduce consumer demand. He also noted that PJM does not factor in the probability of mandated efficiency standards and conservation efforts being implemented.

Dr. Sovacool then points to a 2006 Brattle Group report which found that the accuracy of PJM's load forecasting hinged on the accuracy of the data input into the model. He believes that the Brattle Group's findings should highlight the inherent uncertainty of planning transmission infrastructure in 2010 based on limited and demonstrably flawed data from 2006. The Brattle Group has suggested a number of changes to PJM's forecasting model that would more accurately predict peak demands, but PJM has not yet adopted several of these suggestions.

Dr. Sovacool then testified that, without inclusion of a more accurate determination of projected load in the areas affected by the Project, PJM cannot accurately project the criteria reliability violations that the Project is meant to address, or even if the Project in-service date can ensure that those projected violations will be addressed. Dr. Sovacool stated that the number and severity of reliability violations is founded entirely on the accuracy of PJM past load forecasts. Dr. Sovacool noted that the outcome of PJM's load deliverability test hinges on the definition of an acceptable loss of load expectation ("LOLE"), which cannot be calculated without an accurate projection of load for a given study area in a given year. Dr. Sovocool stated that the accuracy of PJM's defined LOLE determines its calculation of Capacity Emergency Transfer Objectives ("CETO") and Capacity Emergency Transfer Limits ("CETL"), the two most critical variables in PJM's deliverability testing methodology. Dr. Sovacool asserted that the veracity of any claim made on the basis of the outcome of PJM's load deliverability tests depends almost entirely on the accuracy of these inputs, which are determined in large part through PJM's load forecasting. Dr. Sovacool then stated that, if more accurate load forecasting data can delay the need for the Project, even more accurate data could render it unnecessary altogether.

Dr. Sovacool also stated that energy efficiency and demand side management, along with the deployment of distributed generation, offer much better alternatives than the Project because they would be more cost effective, reliable, and secure. He stated that many studies have found that demand side management is the cheapest way to respond to increases in demand for electricity when compared with building new sources of electricity supply or associated infrastructure. He then goes on to state that New Jersey has an immense amount of untapped energy efficiency potential that PSE&G has captured only a small fraction.

Dr. Sovacool cited documentation from the National Association of Regulatory Utility Commissioners that has found that every dollar invested into energy efficiency and demand side management:

- Mitigated against uncertainty and lowered load, wear, and maintenance needs on the entire electricity system, from coal mines and power plants to transmission lines and substations, even in hours when reliability problems were not anticipated by system managers;
- Depressed the costs of locally used fuels such as oil, coal, and natural gas;
- Reduced demand across peak hours, the most expensive times to produce power;
- Lessened costly pollutants and emissions from generators;
- Improved the reliability of existing generators;
- Moderated transmission congestion problems; and
- Operated automatically through customers coincident with the use of underlying equipment or load, meaning they are always "on" without delay or the needed intervention by system operators to schedule or purchase the resource.

Dr. Sovacool also stated that PJM recently noted that their electricity load forecast was down 1.5 percent from 2008 to 2009 and that voluntary curtailment and demand response displaced the need for more than 7,000 MW of supply within PJM region.

Dr. Sovacool testified that displacing the need to erect transmission and distribution lines by implementing energy efficiency measures improves energy security. He testified that PSE&G and PJM have practically ignored the value of utilizing demand-side management to displace the need for the Project. He pointed to PSE&G testimony that stated that demand response is voluntary and can be unreliable. To the contrary, Dr. Sovacool contended that demand reduction is a "flick of the switch" matter. He also stated that PJM has not analyzed the potential for smart/interval metering, which is being used on distribution systems in other areas of the country for peak shaving, load shifting and peak demand reduction.

Dr. Sovacool testified that distributed generation can improve grid reliability, lessen the need to build expensive transmission infrastructure, reduce congestion, offer important ancillary services, and improve energy reliability and security through geographic diversification. Deploying distributed generation units offers an effective and economic alternative to constructing new transmission and distribution lines, transformers, local taps, feeders, and switchgears, especially in congested areas or regions where the permitting of new transmission networks is difficult. Distributed generation can provide utilities with a variety of important ancillary services, including system control, reactive power supply, and spinning reserves. Because of their smaller size, distributed generation has lower outage rates, decreasing the need for reserve margins and excess transmission capacity.

Dr. Sovacool testified that distributed generation and renewable energy resources can provide reactive power locally, while energy efficiency and demand response programs eliminate the need for additional reactive power supply altogether. Researchers at the National Renewable Energy Laboratory, for example, have documented that improved wind turbine and distributed generation power control technologies are creating VAR support capabilities that can be used to enhance the voltage regulation and stability of local grids.

Dr. Sovacool testified that PJM's reliability criteria tests, which discount the ability of planned generation to alleviate reliability concerns, coupled with its transmission planning process, which is biased toward identifying transmission solutions to reliability concerns, results in the overbuilding of transmission infrastructure in ways that cost New Jersey ratepayers and actually may reduce reliability. Without more accurate load forecasting data that properly considers the contribution of non-transmission infrastructure to the alleviation of projected reliability violations, the Project could be a prime example of ratepayers spending more money for less reliable service.

Dr. Sovacool testified that the Project will trigger its own reliability concerns by increasing the risk of voltage instability within PJM. Explaining reactive power, Dr. Sovacool testified that reactive power losses increase exponentially with the distance electricity travels. Modern outages are often a result of voltage instability. Dr. Sovacool testifies that relying on longer and larger transmission networks to wheel greater amounts of real power is the worst strategy for ensuring system reliability.

Dr. Sovacool testified that the Project appears to violate reasonable standards for electricity reliability, and that it conflicts with New Jersey's stated energy policy due to the substantial environmental and social costs of the project. Dr. Sovocool discusses PJM's modeling of planned facilities in its load deliverability and generation deliverability tests. Once an

interconnection customer has executed a Facilities Study Agreement, PJM includes the generator along with all of its identified network upgrades in it base case in order to allow the generator to contribute to generator deliverability problems; however PJM excludes from its base case the capacity of generators that have a signed Facilities Study Agreement, along with their planned protection systems and control devices, to relieve system problems. Dr. Sovocool states that this is not consistent with NERC requirements. Dr. Sovocool also testifes that the Generation Deliverability Study is a test of profitability and not reliability. Dr. Sovocool testified that these disparities in PJM's reliability criteria tests seem to actually encourage the overbuilding of transmission.

Dr. Sovocool also argues that the statute requires PSE&G to consider non-transmission alternatives, not PJM, and that PSE&G itself is required to consider generation as an alternative. Finally, Dr. Sovacool argues that the Project inflicts social and environmental costs that are at odds with New Jersey's stated energy policy.

B. Routing

Jack Halpern, Project Director for the Louis Berger Group, testified that his firm was retained by PSE&G to develop and evaluate alternatives for the New Jersey segment of the Project. In connection with his role as Project Director, he sponsored an Alternative Route Identification Report ("ARI") for the Project, which is a narrative description of the New Jersey portion of the Project.[12]

Mr. Halpern testified that his firm analyzed numerous potential routes using existing aerial photography, field inspections, public meetings, and numerous computerized data sources and that, ultimately three potential routes were identified. Of the three, Mr. Halpern testified that Alternative B, which is the route proposed by PSE&G and that follows the Company's existing ROW, is the appropriate route with the least amount of impacts to the natural and human environment ("Route B"). For descriptive purposes, Alternative A would cross the Delaware River at the northern edge of the Delaware Water Gap National Recreation Area in Montague Township near High Point State Park and head southeast to the proposed Jefferson switching station, where it would then follow the same route as Route B. Alternative C would cross the Delaware River approximately ten miles south of the Delaware Water Gap National Recreation Area in White Township then head east to Roseland. Mr. Halpern testified that the ARI analyzed potential impacts to geology and soils, aesthetics, wildlife and sensitive species, wetlands, recreation lands and natural scenic resources, and cultural resources, among other things.

John P. Ribardo, Manager, Transmission Projects in the Delivery Projects & Construction Department of PSE&G; testified as to public outreach on the Project. That outreach included the construction of a website for informational purposes, and three public workshops. The Company and the Louis Berger Group met with municipalities that requesting meetings to discuss routing. After the proposed route was selected, Mr. Ribardo testified that the Company met again with several municipalities and interested parties, and that it also held four public information sessions in December, 2008 in Sussex and Morris County, which were announced through letters to surrounding property owners, through the media and through the dedicated website.

[12] Exhibit JH-1, and revised Exhibit JH-1a to reflect the noted changes in switching station location.

Robert Pollack, President of Environmental Resource Consulting, LLC, testified for PSE&G with regard to permitting necessary from any Federal, State, or local government agency in order to construct and operate the Project. He testified that PSE&G will need permits from: the National Park Service, the NJDEP (including Freshwater Wetlands, NJ Highlands, Flood Hazard Area Control Act, and Green Acres), the New Jersey Department of Community Affairs ("NJDCA"), the New Jersey Department of Transportation ("NJDOT"), among others. Additionally, PSE&G will coordinate with numerous other agencies, such as US Fish and Wildlife and the New Jersey State Historical Preservation Office.

Mr. Pollack testified that, although there will be environmental impacts as a result of the Project, the proposed route was chosen to minimize such impacts and that the Company is endeavoring to minimize the impacts where practicable. He testified that impacts will be further minimized since the replacement of towers is proposed to take place within the existing ROW. To the extent there will be environmental impacts, however, Mr. Pollack testified that PSE&G will provide mitigation in accordance with all applicable laws and regulations.

Lastly, Mr. Pollack testified that constructing the Project underground is not a feasible alternative because the technology does not exist and because underground cables increase the potential for serious adverse environmental impacts.

Robert L. Gibbs, formerly Manager – Corporate Properties, testified that, although PSE&G does not need to acquire any additional property to construct the Project, it will need to obtain additional real estate rights associated with easements they currently have with sixty-five property owners along certain areas of the ROW. Additionally, PSE&G will need to acquire multiple access points and laydown areas for tower replacement and will be negotiating with property owners to those ends.

In connection with easement modifications, as well as acquiring temporary easements, PSE&G has prepared surveys of subject properties and has engaged a land acquisition and engineering firm, Commonwealth Associates, Inc. ("CAI") to facilitate negotiations with property owners. If CAI is unable to successfully negotiate settlements with property owners, PSE&G will seek to condemn the rights pursuant to N.J.S.A. 48:3-17.6 and 48:3-17.7.

Mr. Franklin, who adopted the pre-filed direct testimony of Mr. Gibbs, clarified in his rebuttal testimony that, where prudent and feasible, the Company has and will continue to acquire additional property for the construction of temporary access roads, permanent access roads, and the construction of associated facilities. Furthermore, at the time of the evidentiary hearings, Mr. Franklin clarified that only twenty-two additional easement modifications were required, as opposed to the sixty-five noted in the direct testimony of Mr. Gibbs.

Helene Jaros, Controller of Residential Home Funding Corporation, testified on behalf of Stop the Lines in opposition to the Project. Her testimony was based on her professional and personal experience, as the transmission lines run through her property. Ms. Jaros testified that the Federal Housing Authority ("FHA") and the Veterans Administration ("VA") have restrictions and prohibitions regarding financing mortgages where the property includes a transmission easement. She testified that, according to the United States Department of Housing and Urban Development ("HUD") rules, properties with high voltage transmission lines may be considered a hazard or nuisance. Additionally, she testified that HUD Publication 4150.2, which identifies the agencies policy with respect to high-voltage transmission lines, states that no dwelling or property improvement may be located within the engineering fall distance of a pole or tower. For appraiser purposes, the tower height can be used as the measurement of the fall distance.

She further alleges that over 95% of the loans her company finances are FHA mortgages, and over that 70% of loans country-wide are FHA mortgages. She concludes that the inability of property owners along the Project route to get an FHA or VA mortgage would have a significant negative impact on the property owners themselves and the community.

C. Engineering and Construction

Richard F. Crouch, Senior Project Manager of Transmission Outside Plant Construction for PSE&G, testified as to background information of the design, engineering, and construction aspects of the Project that are outside of the proposed switching stations. Initially, Mr. Crouch noted that constructing the 500kV line underground is not an option because there is limited experience with installing 500 kV AC cable underground, repairs likely take much longer, there is less capacity potential, and environmental impacts are more significant due to extensive excavation.

Mr. Crouch testified that the Project involves replacing the existing 230 kV transmission lines that were constructed over the course of years from 1926-1931 with a 230kV and 500kV circuit in a vertical configuration. The existing structures range in height from 72.5 feet through 187 feet tall and are steel lattice structures with horizontal construction of the circuit. Mr. Crouch testified that, since the Project involves installing a 230 kV circuit and a 500 kV circuit, the conductors will need to be constructed in a vertical configuration, and that tower height for the new structures will range from 145 feet to 195 feet.

In considering the design of the new structures, PSE&G examined three design types: lattice structures, monopoles, and three pole tubular structures. PSE&G considered the natural characteristics of the ROW, the location of construction access and maintenance roads, and other maintenance and operational factors.[13] Mr. Crouch stated that the height and design of each proposed structures was decided based upon safety criteria as well as economical and feasibility considerations.

Mr. Crouch testified that access roads for construction and lay down areas for towers are still being identified, and that maintenance and operations access that can support construction activities will need to be developed. Additionally, where PSE&G currently has no access, it will need to negotiate with property owners for additional rights. The type of access road required will largely depend on the type of structure being installed and topography. Mr. Crouch also stated that PSE&G will remove any access roads that are not necessary for continued maintenance or operation of transmission facilities, and that the Company will restore the ROW to a condition that is as good, or better, than prior to construction.

Lastly, Mr. Crouch testified that, from the start of construction, the Project is anticipated to take approximately 2 ½ years to complete. All property owners within 200 feet of the ROW will be notified prior to construction and a website identifying construction areas will be developed.

[13] See Exhibit RFC-3 and Site Planning drawings provided with Exhibit P-5, which depicts the ROW from the Roseland Switching Station to the Delaware River, and indicates the proposed locations of new structures. Likewise, RFC-4 indicates the height of each structure and the topography of the specific ROW. The Board notes that during the evidentiary hearing on November 18, 2009, Mr. Crouch provided an updated and revised RFC- 3a and RFC- 4a. Mr. Crouch testified that the changes were based on public comments, field investigations and data gathered from design efforts, and that additionally changes or revisions are likely. 2T 308:1-21.

Richard I. Jacober, Project Manager for Black and Veatch's Power Delivery Business Line, testified as to the conceptual design of the proposed PSE&G East Hanover 500kV GIS and Jefferson 500kV open-air switching stations.[14] Mr. Jacober testified that the use of a GIS facility at East Hanover or Hopatcong and at Roseland provides for a smaller structural footprint because electrical equipment components can be housed together filled with SF6 gas. Mr. Jacober did note, however, that this option is more costly, but that it can minimize visual and environmental impacts on the mostly single-family home residential area of East Hanover.

Mr. Jacober testified that the GIS station will include a four position, breaker-and-a-half (six breakers) GIS switchyard configuration that is expandable to a six position, breaker-and-a-half (nine breakers) switchyard configuration, and that equipment will be housed inside an architectural finished building. Mr. Jacober testified that adjacent property owners will be notified prior to construction activities, and that PSE&G will work to minimize impacts to these property owners. Mr. Jacober stated that certain components of the switching stations will create noise but that, based on mitigating and environmental factors, the noise levels will be below New Jersey State audible noise requirements. Both stations will be designed in accordance with National Electric Safety Code ("NESC") requirements and Good Utility Practice.

Robert J. Millies, a High Voltage Transmission Line Design Project Manager for Commonwealth Associates, Inc, testified as to the conceptual design of structure types and feasibility studies for the approximately 250 tower structures, including cost estimates and construction schedules. Mr. Millies testifies in support of Crouch's testimony supporting the design decisions for the Project. Mr. Millies testified that his firm prepared detailed structure designs for use of monopoles and lattice towers, and that the three pole tubular structures are based upon existing PPL Electric design. He went on to describe the various types of foundations that the structures would require, such as steel-reinforced concrete caissons, grillage foundations at each leg of a lattice tower, or rock anchors, based upon the type of structure, soil strength, and other factors. Mr. Millies stated that foundation types will not be determined until after completion of soil investigations, which are ongoing. Mr. Millies also testified that the structures will not pose any safety hazards to adjacent property owners, and that additional analysis, including galloping analysis to ensure quality and reliability of the structures, will be performed. Lastly, he testified that existing angle towers would need to be replaced for new angle structures in the same location because clearance requirements would not be met by new structures and additional ROW approval would be necessary.

D. EMF

Kyle G. King, President of K&R Consulting, testified on behalf of PSE&G to describe and quantify the electrical effects of the Project, including the EMF levels, corona effects and noise. William H. Bailey, PhD., Principal Scientist and Director of Exponent, Inc., testified on behalf of PSE&G to describe the potential health risks associated with exposure to electrical facilities, including exposure to EMF.

[14] At the November 18, 2009 evidentiary hearing**,** Mr. Jacober testified that, in conformity with its Comprehensive Mitigation Plan submitted to the Highlands Council, PSE&G can construct the Jefferson switching station in Hopatcong, and that the structure and design would remain the same, ie., a GIS switch substation. 2T 310:20-25. Additionally, the proposed East Hanover switching station can be constructed at the existing Roseland substation property, with a change in design from an open-air station to a GIS station. 2T 311:9-11.

With respect to audible noise and radio noise levels associated with the Project, Mr. King testified that the concentrated electric field at the surface of transmission line conductors may cause corona, which can be a source of audible noise, radio noise, and ultraviolet light. In New Jersey, there is a limit of 50 dBA for "continuous airborne sound" between the hours of 10:00 P.M. and 7:00 A.M. N.J.A.C. 7:29-1.2(a)(2)(i). Mr. King testified that the Project's bundle designs will limit corona and noise levels to approximately 36 to 40 dBA at the edge of the right-of-way ("ROW"). These estimated noise levels will increase slightly with the proposed change from a four conductor bundle to a three conductor bundle, but are estimated to remain below New Jersey's limit and are comparable to the existing circuit design on 38.5 dBA at the edge of the ROW.

With respect to magnetic fields, Mr. King testified that in 2013, the magnetic field from the median current at the edge of the ROW will range from 23 milligauss ("mG") to 32mG in the existing 230kW Bushkill to Montville line and be approximately 7mG in the existing 230kV Montville to Roseland line. After completion of the Project, the expected magnetic field in 2013 from the median current at the edge of the ROW in the Bushkill to Montville line will range from 29mG to 57mG on the 500kV circuit side, and 12mG to 20mG on the 230kV circuit side. In the Montville to Roseland portion of the project the magnetic field along the edge of the ROW will be approximately 38mG to 42mG on the 500kV circuit side, and 19mG to 21mG on the 230kV circuit side. The maximum magnetic field levels at the edge of the ROW for the completed project are expected to be 115mG on the 500kV side and 58mG on the 230kV side.

The electric field at the edge of the ROW will be approximately 1.6 kilovolts per meter ("kV/m") on the 500kV side and 0.5kV/m on the 230kV circuit side. The existing 230kV circuit's electric field at the edge of the ROW is approximately 0.8kV/m. The maximum electric field within the ROW for the completed Project is expected to be approximately 4.5kV/m.

Mr. King and Mr. Bailey testified as to existing standards for EMF. While there are no standards for electric fields within the ROW, New Jersey has adopted a 3kV/m electric field standard at the edge of the ROW. [15] There are also no standards in New Jersey for magnetic fields at the edge of the ROW, or within it.

Elsewhere in the United States, only seven states have adopted standards for electric fields and only two states have adopted standards on magnetic fields (Florida and New York). The table below summarizes existing standards in the United States.

[15] Interim Guidelines adopted on June 4, 1981 by the New Jersey Commission on Radiation Protection.

EMF Standards in the United States		
Electric Field Regulations		
State Agency	**Standard within the ROW (kV/m)**	**Standard at the edge of the ROW (kV/m)**
Florida Department of Environmental Regulation	**8** (230kV) **10** (500kV)	**2**
Minnesota Environmental Quality Board	**8**	**-**
Montana Board of Natural Resources and Conservation	**7**	**1**
New Jersey Department of Environmental Protection	-	**3**
New York State Public Service Commission	**11.8**	**1.6**
Oregon Facility Siting Council	**9**	**-**
Magnetic Field Regulations		
State Agency	**Standard within the ROW (mG)**	**Standard at the edge of the ROW (mG)**
Florida Department of Environmental Regulation	-	**150** (230kV) **200** (500kV)
New York State Public Service Commission	-	**200**

Additionally, Mr. Bailey testified regarding the standards established by the International Committee of Non Ionizing Radiation Protection ("ICNIRP") which recommended a screening value of 833mG and 4.2kV/m for EMF exposure to the public. The International Committee on Electromagnetic Safety ("ICES") recommended residential exposure limits of 9,040mG and 5kV/m. Dr. Bailey testified that the projected EMF levels associated with the Project will be within these standards.

On the potential effects of EMF on human health, Dr. Bailey testified that no multidisciplinary scientific review panel has concluded that long-term exposure to magnetic fields is likely to cause any adverse health effects on humans and, as a result, no standard or guidelines have been recommended for magnetic fields at strengths normally encountered in the human environment. Dr. Bailey explained that a study from the International Agency for Research in Cancer ("IARC")[16] and a World Health Organization's ("WHO") evaluation of research literature through 2005,[17] classified magnetic fields as a "possible carcinogenic." No such classification was made for electric fields. According to Dr. Bailey's testimony, however, this classification does not mean that magnetic fields cause, or are likely to cause, cancer to humans; rather, only that the possibility exists but that other explanations have not been explored. The classification of magnetic fields as a "possible carcinogenic" is based on the association established in some statistical studies between adverse health effects on humans and exposure to magnetic fields.

[16] "Static and Extremely Low Frequency Electric and Magnetic Fields". IARC, 2002.
[17] "Extremely Low Frequency Fields Environmental Health Criteria Monograph No. 238". WHO, 2007.

Dr. Bailey adds that there have been approximately 35 studies throughout the world on magnetic field exposure and certain health affects to adults or children. A pooled analysis of those studies reported a statistical association between average exposure to greater than 3-4 mG and childhood leukemia; however Dr. Bailey insisted that that finding has not been interpreted as causal in nature because of the limitations of the underlying studies and the pooling analysis itself.

Martin Blank, PhD., Associate Professor of Physiology and Cellular Biophysics at the College of Physicians and Surgeons, Columbia University presented testimony on behalf of the Municipal Intervenors. Dr. Blank testified that recent research has shown potentially harmful biological effects at low level magnetic field exposure for extended periods of time. He recommended that peak magnetic field levels should not exceed 3-4mG. Dr. Blank relied on the National Institute of Environmental Health Sciences ("NIEHS") EMF review panel, which considered magnetic fields as "possible human carcinogen", and at two pooled studies showing a statistical association between childhood leukemia and EMF levels exceeding 3-4mG. Dr. Blank testified to other biological effects of EMF exposures, such as changes in cellular processes of energy production and utilization and activation of DNA that contains genetic information based on in vitro experiments he conducted.

Dr. Blank's research showed that certain cells react to low EMF levels by creating stress protein. According to Dr. Blank, EMF interaction with DNA is important because cancer is associated with changes in DNA (mutation), which may be a probable explanation to certain epidemiology results. Dr. Blank adds that the proposed 500kV line would add to the level of EMF from the existing 230kV line and thereby create an additional potential hazard, contrary to the recommendations of the NIEHS' May 1999 Report to Congress.

Dr. Bailey's rebuttal testimony urged that Dr. Blank's hypotheses are not supported by clear evidence. According to Dr. Bailey, the effects of magnetic fields on heat shock gene expression are very controversial and not as robust as Dr. Blank's testimony implies. Importantly, he notes, Dr. Blank chose not to discuss the failure of many independent scientists to replicate the basic phenomena underpinning his hypotheses. In addition, Dr. Blank's studies did not include tests for DNA damage relevant to the assessment of potential cancer risks; rather, his research focuses on chemical reactions to isolated cells exposed to magnetic fields in vitro. Dr. Bailey asserts that, only under limited circumstances, which are not met by Dr. Blank's research, can in vitro studies provide useful information of direct relevance to human health. To be clear, says Dr. Bailey, in vivo studies measure the exposure of laboratory animals to EMF, while in vitro studies are designed to evaluate the way that exposure acts on cells and tissues outside of the body. Although in vitro studies can be used to investigate the possible mechanisms for effects that may observed in living organisms, the responses of cells and tissues outside the body may not reflect the response of those same cells if maintained in a living system. Dr. Bailey concludes by emphasizing that scientific agencies have not concluded that the statistical association between magnetic fields and childhood leukemia represents a causal relationship or that any guidelines or actions should be taken. Particularly, no scientific agency has recommended that 3-4mG be used as the health standard for magnetic fields.

IV. POST-HEARING INITIAL BRIEFS

Pursuant to the schedule ordered by Commissioner Fiordaliso at the close of evidentiary hearings, post-hearing briefs were submitted by the parties on December 28, 2009.[18]

A. PSE&G

In its Initial Brief, PSE&G contends that it has submitted indisputable evidence in this matter that the Project is reasonably necessary for the service, convenience or welfare of the public and requested that the Board issue an Order 1) authorizing PSE&G to unconditionally commence construction immediately, while recognizing the ongoing jurisdiction of other agencies, 2) authorizing PSE&G to commence construction of switching stations at the alternate locations in Hopatcong and Roseland, and 3) permitting PSE&G to revise the Project as may be required or authorized by other agencies having jurisdiction over the Project.

PSE&G initially argues that, under the established legal principles that have guided the Board in previous decisions brought under N.J.S.A. 40:55D-19, the Board must grant PSE&G's petition.

With respect to the issue of need, PSE&G provides an extensive overview of transmission systems in general when emphasizing the critical role that transmission reliability planning plays in ensuring that the Company continues to provide safe and reliable electric service. PJM, as the RTO, must incorporate the mandatory reliability planning standards established by NERC; failure to comply with theses standards can result in penalties of up to $1 million per day per violation.

PSE&G argues that the RTEP is an open, transparent process that incorporates a variety of factors into its analysis. PSE&G argues that PJM's 2007 RTEP, the 2008 RTEP, and the March 2009 Retool identified several transmission reliability criteria violations beginning as early as 2012. PSE&G claims that it identified a number of alternatives to resolve the violations, but that it was ultimately PJM that identified the need and selected the Project. Other options, including the Bossards-Jefferson 500 kV line, the Stanton-Roseland 230 kV line, and installing new conductors so that overloaded facilities could transport more power, were dismissed because they were not robust enough or did not provide long-term solutions to the violations.

PSE&G attempts to discredit the Municipal Intervenors witnesses because they have never been involved in the operation or management of an electric transmission and distribution system. PSE&G stresses that, contrary to the contentions made by the witnesses, the RTEP process does fully take into account demand response and energy efficiency and that the violations identified in the March 2009 Retool remain after factoring them in. PSE&G defends the RTEP's inclusion of only committed demand response and energy efficiency, as well as other resources, as necessary and prudent to ensure continued reliability. PSE&G points to the EMP's recognition that it's aggressive demand response and energy efficiency goals cannot replace traditional generation resources and utility infrastructure. PSE&G believes, in any event, that demand response and energy efficiency cannot be relied upon to solve the number of violations expected to occur, especially in a short timeframe. To the contrary, the Company argues that demand response and energy efficiency, if undertaken in sufficient quantity, could result in additional generation retirements or completion of less new generation, thereby still

[18] The Board notes that the post-hearing brief of Exelon was submitted on December 29, 2009 with consent of the parties, and accepts it as timely.

resulting in continued need for the Project. Lastly, it argues that demand response and energy efficiency will not address the ten Category C double circuit contingency violations identified in the RTEP, because these contingencies are modeled under non-emergency conditions where there is no warning or time to implement demand response, and when PJM lacks the authority to call demand response resources.

PSE&G believes that the Municipal Intervenor's witnesses' contentions that the RTEP did not account for the economic crisis are unfounded because the March 2009 Retool occurred well after the onset of the crisis and still identified 23 violations. The witnesses fail to recognize that these violations must be resolved, regardless of their magnitude. PSE&G also claims that the witnesses' contentions with respect to reactive power are unsubstantiated and incorrect.

With respect to routing, construction, and engineering, PSE&G argues that it determined the most appropriate route for the Project. The Louis Berger Group, who was retained by PSE&G to develop alternatives for routing, identified the route as the most appropriate route for the New Jersey portion of the line for the reasons noted in the ARI Report and noted above in the summary of Mr. Halpern's testimony above. PSE&G again notes, however, that this route is the preferred route based primarily on the fact that it follows the existing PSE&G ROW that has been in existence since approximately 1930. PSE&G claims that the only suggested alternative came in the form of a marked up map submitted by the Municipal Intervenors suggesting an alternate route around the Township of East Hanover.[19] PSE&G believes that its witnesses made clear that the suggested alternative portion of the route around East Hanover is not feasible because of environmental and historic preservation constraints. Additionally, such an alternative would require that transmission lines be placed along interstate highway property, which is not permitted by the NJDOT, except in cases of extreme need where there are no alternatives.

On the issue of EMF, PSE&G contends that, through the testimony of Dr. Bailey, it has established that there is no causal link between EMF and adverse health effects to humans. PSE&G argues that, over the course of 30 years, the research "has not found 'consistent or strong evidence of harm to humans' and that there is no reliable scientific basis to conclude that adults or children living near the ROW will have any adverse health affects." PSE&G Initial Brief at 68. PSE&G argues that the levels of EMF that are expected as a result of the Project, as was modeled and testified to by Mr. King, will be below the guidelines for electric fields for New Jersey, as well as the standards set for magnetic fields in Florida and New York, the only states that have such standards.

PSE&G goes on to argue that the testimony of the Municipal Intervener witness, Dr. Blank, is unreliable and inconsistent with EMF research over the past 30 years. PSE&G urges that the Bioinitiative Report, which Dr. Blank relies on for his contentions, is not credible and has been the subject of international criticism and that, in any event, it supports the conclusion that there is no clear connection between EMF and health hazards. PSE&G also attempts to refute Dr. Blank's testimony by indicating that no other scientist has been able to replicate his research with certain cells, which he believes supports the contention that EMF has associated health concerns.

PSE&G argues that the Project will not impact property values because the line will be built on the existing ROW, where transmission lines have traversed since approximately 1930. The transmission lines predate virtually all of the currently existing residences along the ROW and

[19] The Board notes that this map was submitted by the Municipal Intervenors as Exhibit MI-4.

PSE&G believes there no evidence was presented to indicate that property values will decline as a result of the Project.

The Company then argues that the testimony of Stop the Lines witness Helene Jaros is without merit. Ms. Jaros, who testified as a real estate professional and property owner living along the ROW, claimed that properties owners with transmission line easements on their property will not be able to obtain FHA mortgages if the Project is constructed. She also claimed that FHA mortgages cannot be obtained where the dwelling is within the engineered fall distance of a transmission line tower. PSE&G refutes this contention because Ms. Jaros admitted she did not know the fall distance, and did not request that information from PSE&G. Additionally, even if the fall distance were relevant, PSE&G argues that its engineering witnesses have indicated that the engineering fall distance is only the general vicinity of the foundation of the structure because towers do not generally topple over.

PSE&G argues that it has taken numerous proactive steps to reduce any adverse environmental impacts associated with the Project, including selecting a route that traces the existing ROW, limiting temporary and permanent impacts to wetlands, forested areas and other critical areas, revising transmission structure locations and access roads to reduce impacts where feasible, and developing an avian protection plan. PSE&G will be coordinating with other agencies with expertise or jurisdiction over these issues.

PSE&G claims that the Project revisions or refinements made since the inception of this matter are typical of a project this size and that, in each instance, they resulted from the Company's efforts to address concerns of affected municipalities, property owners, or governmental agencies. PSE&G relies on In Re Public Service Electric & Gas Co., 35 N.J. 368 (1961), for the proposition that the Board need not approve the location of every access road or tower location, but that the Board simply make a determination that the Project as a whole is reasonably necessary. Here, the Company argues that to determine otherwise would be impractical. The Company further stresses that none of the changes made or suggested as alternative options have fundamentally changed the Project and that, in the past, the Board has approved a 500 kV transmission line in without specific tower locations or access roads being finalized. Id.

PSE&G then discusses the modifications to the Project that have developed since the filing of the Petition. The first alteration would change a quad-bundled conductor on the 500 kV line to a tri-bundled conductor and double-bundled conductor on the 230 kV line to a single conductor. This change was the result of the municipalities' preference for the use of monopoles. The Company stated that it will still meet the New Jersey Audible Noise Requirements, N.J.A.C. 7:29-1 et seq. and that the change will not affect any other electrical parameters, such as ampacity, except that electric fields will be reduced. The second alteration involves tower and access road locations, which the Company indicates were modified as a result of public input and environmental concerns. Again, PSE&G claims that none of these changes affect the routing of the Project.

Lastly, PSE&G has proposed alternative locations for the switching stations planned as a result of the Project. As a result of public input and discussions with the Highlands Council, PSE&G proposed to construct a switching station in the Borough of Hopatcong as an alternative to the open-air switching station planned for Jefferson Township. Additionally, as a result of concerns raised by the Township of East Hanover, PSE&G has proposed to change the location of its Eastern Terminus Station from a GIS switching station in East Hanover to a GIS switching station on its current property in Roseland. PSE&G urges that these changes would be beneficial to the public and that the Project should be approved with these modifications.

B. Montville BOE

The Montville BOE states that it has significant safety concerns with the proposed Project, primarily because the location of the existing power lines is adjacent to the Lazar Middle School, causing a potential danger to school children if a tower collapses or if power lines are downed.

The Montville BOE also states that the Lazar Middle School's expansion plans are negatively impacted by the proposed addition of the Project. The Montville BOE states that it anticipates expansion of the building in the next few years and that the only place for expansion is toward the back of the school, even closer to the transmission lines.

The Montville BOE also argue that the EMF levels at the Lazar Middle School will be above acceptable levels if the Project is approved. This is especially true if there is a school expansion. The Montville BOE argues that PSE&G's expert, Mr. King, was alone when he performed EMF testing at the school so there is no way to verify the results of Mr. King's testing.

The Montville BOE states that, although Mr. King posits that the existing EMF levels are within acceptable limits, an acceptable limit is a matter of debate. Regardless, the Montville BOE states that the projected EMF levels after the Project is built would far exceed acceptable levels. Mr. King's report shows extremely high EMF levels after the Project is built, but the report is crafted in such a way as to make those EMF readings appear insignificant because it graphs median values of EMF, not maximum values. The graph does not provide guidance for EMF measurements during the 50% of the time that the median currents are expected to be exceeded.

The Montville BOE states that, while the technical and scientific issues regarding EMF are confusing, there is a responsibility to protect children from the dangers of EMF. It believes that the Board should be guided by the research, findings, and recommendations of the WHO and the NIEHS as described in Dr. Martin Blank's testimony and exhibits. The Montville BOE states that PSE&G admits that the EMF levels will far exceed the NIEHS standard with a median level of 19.3mG and a maximum level of 57.4mG at the edge of the ROW. Dr. Blank recommends 3-4mG for peak EMF levels and the maximum of 57.4 is obviously significantly higher. This is especially important because the edge of the ROW is 150 feet from the right field fence of the baseball field.

The Montville BOE also states that the median levels, which show EMF at the edge of the ROW reaching up to 20.9mG, are seven times greater than Dr. Blank's recommended 3mG. The Montville BOE states that PSE&G did not provide any way to evaluate the EMF levels as they approach the ball fields and the school building because PSE&G did not model the EMF levels in that area.

The Montville BOE also argues that the proposed new towers will be aesthetically unpleasing and that landscaping cannot provide a sufficient natural screen for transmission towers that are almost 200 feet tall. The Montville BOE notes that, had PSE&G choose a different route, they would have been able to acquire a 200 foot ROW, and would not need such tall towers.

In sum, the Montville BOE argues that PSE&G has failed to meet its burden of proof that the project is safe, both in terms of the structures themselves and the electromagnetic fields that the lines will generate behind the Lazar Middle School. Additionally, PSE&G has failed to provide

certain EMF information which would have been helpful to an analysis of the EMF issues, including the anticipated EMF levels on the school ball fields.

The Montville BOE request that the towers near the Lazar Middle School be relocated and/or realigned in accordance with the prudent avoidance doctrine referenced in In Re Petitions of Vermont Electric Power Co. and Green Mountain Power Corp., 179 Vt. 370, 895 A.2d 226 (2006). The Montville BOE states that PSE&G's proposed Project will raise EMF levels above what the WHO and NIEHS recommend, and that the prudent avoidance approach should be applied. Specifically, the Montville BOE recommends that the three towers nearest the school be moved or realigned so that he new configuration would place the Project further from the school and the school ball fields.

The Montville BOE lastly argues that the BPU should require the towers to be moved because of the public nuisance decision in State of Connecticut v. American Electric Power Co., 582 F.3d. 309 (2nd Cir. 2009). This case involved the public nuisance of global warming due to greenhouse gases.

C. Municipal Intervenors

In its Brief, the Municipal Intervenors argue that the Project is not needed and cannot be justified under the applicable legal standards. In sum, they believe that PSE&G has failed to meet its burden of proof and that the Petition should be dismissed.

The Municipal Intervenors initially argue that the Petition is not ripe for review because the cost allocation scheme for the Project is unclear because of the Seventh Circuit Court of Appeals decision remanding PJM's cost apportionment scheme. Because no alternative cost scheme was submitted, says the Municipal Intervenors, it is impossible, as a matter of law, to ascertain whether the Project is reasonably necessary for the service, convenience or the welfare of the residents of New Jersey.

It is also not ripe for review because PSE&G has presented only preliminary plans for the Project. According to the Municipal Intervenors, it is vital that any project presented to the Board for consideration be a final project. Unlike a situation where the applicant seeks preliminary plan approval from the local planning board or zoning board with the need to return for final approval, here PSE&G has no obligation to bring the Project back to the Board or to heed local zoning ordinances and master plans. Preliminary designs and reports would be unacceptable for the purpose of final site plan approval, and they should be unacceptable here.

The Municipal Intervenors argue that the Petition is not ripe because the Project has changed significantly since the filing of the Petition. Additionally, PSE&G's settlement with former intervenor Fredon Board of Education included the relocation of several towers further away from the Fredon School. Again, on November 16, 2009, the first day of the evidentiary hearings, PSE&G presented new site plans to the Board and the parties illustrating new access roads and tower locations. PSE&G never moved before the Board for permission to amend the Petition and reflect the changes it imposed on the Project. Furthermore, no open houses or public meetings were conducted to address any of PSE&G's amendments to the Project. The Municipal Intervenors assert that the Board's administrative regulations provide that any significant change in facts or circumstances following the filing of the date of a pleading requires the prompt filing of an amendment of pleadings to reflect those changes. N.J.A.C. 14:1-4.7.

As to whether these changes are significant, the Municipal Intervenors argue that the Petition describes the switching stations as an "integral" component of the Project. Thus, PSE&G's Petition documents should have been amended and assigned a new filing date. According to the Municipal Intervenors, if the Board allows these proceedings to continue without formal amendment, it would violate the due process rights of the parties. They also contend that, to proceed without formal amendment would be against the Board's regulations.

The Municipal Intervenors argue that PSE&G has failed to show that the Project is needed. They argue that the Project is an expansion project, and not a reliability project. PSE&G introduced not less than four different data sets derived from the 2007 RTEP analysis, the 2008 RTEP Retool, the draft March 2009 Retool and the final March 2009 Retool. PJM changed the analytical methodology of the data with every successive data set introduced and utilized different assumptions, inputs and calculations, which produced different results. In PSE&G's Petition, the need was based on 23 potential reliability violations projected to occur from 2012 to 2022. However, the March 2009 Retool shows that ten of them have been pushed out beyond the 15-year planning horizon and thus are no longer relevant to this proceeding. With the number of reliability violations cut almost in half, the Municipal Intervenors argue that PSE&G should look at alternative solutions that are more cost effective and less environmentally intrusive.

They argue that PSE&G failed to consider alternatives to the Project, including energy efficiency, load shifting and conservation policies and mandates. Moreover, although demand response is already included in the forecasting, any assumptions about increases in demand response are not considered relevant to the forecast retools.

The Municipal Intervenors suggest that decreased energy consumption negates the need for the Project. The decrease in peak demand, overall electricity demand, and sales in the region over the past two years is so significant that current and projected consumption rates cancel out all of PSE&G's claims that the Project is needed. Additionally, they argue that current forecasts show little sign of increased demand in the near future.

In addition, the Municipal Intervenors contend that power transfers along long transmission lines depress voltage and require more reactive power. Reactive power losses increase exponentially with the distance transmitted requiring more current to make up for reactive power losses and subsequently risking larger voltage drops. As voltage drops, say the Municipal Intervenors, current must increase to maintain the power supply. If the current increases too much, the transmission lines will trip, overload other lines, and potentially cause cascading failures.

Finally, the Municipal Intervenors assert that the Project is not economically necessary for PSE&G to address congestion. As reflected in PSE&G's Securities and Exchange Commission ("SEC") filings and in PJM's 2009 Third Quarterly State of the Market Report, the cost of energy has declined. The drop in demand and price leaves an electricity market glutted with supply and congestion is no longer an overriding problem. It further reflects that PSE&G congestion costs were significantly lower than those of other utilities in the region. Furthermore, the Municipal Intervenors contend that PJM plans to direct one-third of the power to two merchant transmission projects (685MW to Neptune and 330MW to EPC), which further calls into question the economic benefits of the Project.

They contend that the Project is contrary to federal and state energy initiatives and policies, and that it is against the public interest. According to the Municipal Intervenors, the Project will import primarily electric energy generated by coal-fired power plants from the west and,

therefore, the Project is on its face inconsistent with the EMP and is contrary to the interests of neighboring states. The Project meets none of the EMP's goals. Furthermore, the EMP could not be clearer in its directive that New Jersey must be proactive in transmission policies and actions, and ensure its part in the decision-making process at PJM and FERC. In addition, the Project contravenes the policies of nearby states, which have objected to west-east transmission of coal.

Lastly, the Municipal Intervenors contend that PSE&G cannot guarantee that levels of EMF emitted by the proposed new power lines will be safe. In the absence of definite proof that EMF from power lines is not harmful to humans, the Board should deny the Petition, at least until such time as PSE&G can investigate the one known cluster and demonstrate that there is no nexus linking those illnesses to EMF. There is conflicting testimony in the record with respect to whether there is a nexus between EMF and harm to children or adults. The Municipal Intervenors urge that there should be a safe level of EMF exposure. Dr. Blank recommended levels of magnetic fields not exceeding 3-4 mG at peak load. The Municipal Intervenors put emphasis on the fact that PSE&G witness Mr. King reported magnetic field calculations for median current levels that far exceed the levels recommended by Mr. Blank. The Municipal Intervenors highlight that these levels of magnetic fields are going to be exceeded 50% of the time according to Mr. King's testimony, and that Mr. King's measurements are for 2013. For each of these reasons, the Municipal Intervenors assert that the Project presents a health risk.

D. Exelon

Exelon preliminarily argues that the need for a reliable energy supply is self-evident, and that the record amply demonstrates that the Project is needed. After providing a detailed background into the development of the NERC reliability standards and the RTEP process, Exelon stresses that the transmission planning process is dynamic and ongoing. Exelon points out that PJM's 2007 RTEP initially identified the reliability criteria violations which were later confirmed in the 2008 RTEP. Furthermore, the 2009 Retool that took into account a significant decline in load resulting from the economic downturn in 2008 and 2009 again confirmed that there are still violations occurring as early as 2012. Exelon argues that NERC standards require PJM to implement solutions to violations regardless of the magnitude of the violation, but that, in any event, these violations are significant and require a robust transmission solution.

Exelon contends that the intervenors have not refuted the need for the Project. It argues that the testimony of Municipal Intervener's witness Mr. Cooper is unsupported by the record and must be rejected. Exelon argues that Mr. Cooper's reliance on PJM's delay of the in-service date of its planned MAPP and PATH transmission lines as evidence that reductions in consumer demand as a result of the economic recession could obviate the need for the Project is without merit. To the contrary, Exelon argues the fact that the MAPP and PATH projects were delayed or changed only underscores the validity of the RTEP process used for the development of the Project because the same process was implored in each instance.

Exelon goes on to argue that, contrary to the testimony of Mr. Cooper, demand response, energy efficiency, and distributed generation resources cannot resolve the RTEP identified reliability criteria violations. They are not available in sufficient quantities to solve the violations and are not sufficiently certain, measurable, and verifiable to satisfy NERC's reliability requirements. Exelon urges that, notwithstanding the testimony of Mr. Cooper, which was refuted at the evidentiary hearings by Mr. Herling, demand response and energy efficiency are generally viewed as too unpredictable to rely on for use in the RTEP until they are fully committed as capacity resources. Even then, Exelon stresses, they cannot address Category C

violations because they take too much time to implement. Also, only demand response located near the Project in Northern New Jersey can be effective. Exelon, like PSE&G, also notes that reduced energy demand and consumption may lead to additional retirement of generation resources, which could result in an increased need for the Project.

Similarly, Exelon argues that energy conservation and renewable programs promoted in the EMP do not provide a solution for the need for the Project. While Exelon supports the goals of the EMP, it believes that it would be poor public policy to plan a critical backbone transmission system on the premise that the goals in the EMP will be achieved on a timely and sustained basis. Exelon contends that there was an assumption in the EMP that this Project would be built, that its goals are aggressive, difficult to achieve, and that they involve new or untested technologies.

Exelon refutes the testimony of Dr. Sovacool and Mr. Cooper by pointing out that they have not performed any studies that would show that any alternatives could solve the reliability issues associated with the Project. They also have no direct or personal knowledge of the New Jersey's efforts to implement the EMP, energy efficiency or demand response, which to date have remained largely untapped. Lastly, Exelon points out that it is unclear whether and to what extent Governor Christie will adopt the policies and goals of Governor Corzine's EMP. For all of the above reasons, Exelon urges the Board to grant the Petition of PSE&G.

E. Stop the Lines

Stop the Lines is an organization of landowners and residents that claim to be directly affected by the Project. Stop the Lines argues PSE&G has not met the burdens of production or burden of proof to demonstrate a need for the Project and, therefore, the Petition should be denied. It claims PSE&G has not submitted a complete Project, and believes the Project is not about reliability at all; rather, the Project is really intended to alleviate constraints which inhibit the west-to-east transmission of coal generated power to eastern markets.

Stop the Lines argues that the Petition should be denied because PSE&G studies, plans, industry reports and documents entered into evidence show that the system can handle future and existing loads. It claims that the real purpose of the Project is to expand PJM's economic market. Stop the Lines criticizes the RTEPs that identified the need, claiming that PSE&G is continually changing the RTEP with different data sets and assumptions in an effort to avoid critical analysis by stakeholders and the Board. Based on the RTEP, it does not believe reliability is an issue. It complains that changes in the data, assumptions, and methodology of the RTEP have frustrated the intervenor's ability to perform an analysis. It also claims that PSE&G has brushed off any critiques by simply promising to incorporate said criticism into next RTEP. Stop the Lines argues that PSE&G's performance makes it impossible for the Board and the intervenors to discern and apply information necessary to inform the record.

Stop the Lines claims the original reasons for the Project no longer exist because the violations either will no longer occur or are not scheduled to occur for an extended amount of time. It points out that the 500kV violation has been pushed out beyond the fifteen year planning period and argues that most violations are nominal in nature. It claims only two violations are scheduled to occur in 2012; it may be less environmentally intrusive and more cost effective to handle these problems individually rather than a complete overhaul of the transmission lines. Stop the Lines argues that because the violations are not as severe as originally characterized, other solutions, such as re-conductoring, should be considered and a more recent retool study is necessary to accurately weigh the need for the Project.

Stop the Lines claims PSE&G has failed to incorporate the most recent economic conditions into its analysis and that the March 2009 Retool already shows a pattern of decline in reliability violations. It contends PSE&G is ignoring indicators by hiding behind exaggerated projections to justify need for the Project. It also offers load, price and quarterly reports as evidence that demand has decreased and the need for the Project does not exist.

Stop the Lines contends that the Project is not intended for New Jersey or reliability to New Jersey but is in fact intended to provide transfer capacity throughout the region. It states this is evidenced by FERC rate recovery for the Project, which is committed to serve points east of New Jersey, and firm transmission withdraw rights that were assigned to Neptune Regional Transmission System and East Coast Power.

Stop the Lines puts forth the same arguments with respect the status of the cost allocation scheme as the Municipal Intervenors and argues that, because cost apportionment is unclear, the Board should dismiss the petition without prejudice and allow PSE&G to re-file when a new cost allocation has been approved by FERC.

It claims the Project is part of a larger initiative of PJM called Project Mountaineer, which plans to bring low cost coal resources to eastern markets. STL argues this will increase leakage, circumvent the Regional Greenhouse Gas Initiative ("RGGI"), and is contrary to the EMP.

Stop the Lines also believes the Project conflicts with public interest because it harms landowners along the ROW as well as ratepayers. It states the preferred width for 500kV lines is 200 ft. which is larger than the 125ft. ROW which currently exists along the proposed route. It contends when landowners have transmission lines on their property they are unable to receive a mortgage from Federal Housing Authority ("FHA") due to perceived risk. It believes, therefore, that affected landowners will not be able to move because finding a buyer will be impossible.

Stop the Lines argues that too much information is undisclosed and too many issues remain unresolved to warrant Board approval. It complains that changes to the transmission line, switching station type and locations, and submittal of relevant information at the last minute, have interfered with an appropriate review of the Project by the intervenors and the Board.

Based on these reasons, Stop the Lines requests a comprehensive mitigation plan be ordered to address landowner, resident and ratepayer concerns. It requests that a complaint process be established and that the Board condition approval on FERC approval of a cost allocation scheme, as well as place limits on the amperage levels for the Project. Stop the Lines also requests an escrow account be created with funds available to compensate affected landowners for property damage associated with the Project. Lastly, Stop the Lines requests assurances that the magnetic field levels remain at or under those estimated and that sound levels of the Project comply with New Jersey's audible noise requirements.

F. Environmental Intervenors

The Environmental Intervenors argue that PSE&G has not proved that the Project is reasonably necessary for the safety, convenience, or welfare of the public. They stress that the January, 2008 peak load forecast, which is part of the RTEP, did not factor in the current economic recession which has significantly curtailed energy demand. They also state that the March 2009 Retool has shown the severity and number of potential reliability violations has been reduced by these economic factors.

Further, they argue that PSE&G and PJM did not include the May 2009 RPM Auction, or any sensitivity analysis including the EMP, in their peak load growth reduction estimates. Therefore, according to the Environmental Intervenors, a retool study should be added to the analysis which incorporates recent economic events and these other factors. They contend that without such an analysis, PSE&G cannot not satisfy its burden of proof and therefore the Board cannot approve its Petition.

Environmental Intervenors also claim that the Project is unnecessary because the predicted reliability violations are based on out-of-date and incomplete information. They argue that PJM's transmission analysis is flawed because it uses peak demand data, as opposed to energy usage data, resulting in an inflated estimate of the need for the Project. They also argue that PJM's addition of the NERC Category C reliability violations is "suspicious," because they were only discovered one month before the evidentiary hearings.[20] It is unclear why Category C events are considered reliability criteria violations, since load shedding and generation rejection are permitted for these contingencies. Importantly, however, PSE&G and PJM did not consider any load curtailment in their analysis of double circuit contingences. The Environmental Intervenors consider this an indication that PSE&G is trying to inflate the need for the Project.

To be more precise, the Environmental Intervenors claim that the March 2009 Retool's demonstration of the severity of the reliability violations is overstated. They insist that the March 2009 Retool only indicates 13 violations, three of which occur after 2019. Additionally, the March 2009 Retool moves past the fifteen year planning horizon used by PJM. According to the Environmental Intervenors, only ten 230 kV system overloads remain, and an updated retool would decrease the forecasted violations even more.

Environmental Intervenors argue that the peak load forecast used to justify the Project is outdated. They contend that PSE&G and PJM should submit another retool study because: 1) the economic downturn has affected demand, 2) there is additional energy efficiency and demand response resources available as a result of the May 2009 RPM Auction, 3) the EMP and Pennsylvania Act 129 ("PA Act 129") were not considered, and 4) new alternatives are available to address the potential violations.

Next, the Environmental Intervenors argue that the Project should be delayed because the anticipated violations indicated by the March 2009 Retool do not occur until a later date and additional capacity resources may be available in the future. Reliance on transmission solutions for reliability violations only exacerbates reliability issues by increasing the risk of voltage instability. They point to the testimony of Dr. Sovacool, who stated that the reactive power characteristics of large transmission lines have negative implications for reliability.

They argue PSE&G only meaningfully examined transmission solutions to address the reliability violations and did not honestly examine other alternatives, even after the March 2009 Retool Study, including increased local generation or demand reduction. Environmental Intervenors also believe the alternative routes considered for the Project are not credible and that the Project route was preordained.

Environmental Intervenors are not convinced that the environmental impacts of the Project have, or will at some time in the future, be appropriately investigated, and they believe that PSE&G does not have the expertise or resources to assess and mitigate the impacts.

[20] Environmental Intervenors Initial Brief at 20.

Environmental Intervenors argue that the Project will negatively impact state and federal natural resources and will harm habitats and ecosystems. They find it frustrating that PSE&G has not completed its environmental studies identifying how the Project will affect the environment. Environmental Intervenors argue that the Board is unable to make a determination if the project is reasonably necessary.

Should the Board approve the Project, the Environmental Intervenors argue the law precludes PSE&G from immediately beginning construction because additional federal permits and licenses may be necessary and a Board Order authorizing immediate construction would, according to the Environmental Intervenors, contravene federal law.

They further contend that the cost apportionment scheme which PJM relies on as a basis for support of the Project has been "dismantled," as a result of Illinois Commerce Commission v. F.E.R.C., (576 F. 3d 470 7th Cir. 2009), which remanded PJM's cost allocation scheme for this Project to FERC for further review. The Environmental Intervenors argue it is not reasonable for the Board to approve the Project without a cost apportionment scheme, because there is no way to assess how the Project will affect ratepayers. Furthermore, the Environmental Intervenors claim PSE&G is seeking to recover a substantial amount of the costs through FERC incentives.

Like Stop the Lines, the Environmental Intervenors believe that the Project is part of a scheme to move cheap coal fired power into the more lucrative Northeastern energy markets.

For all of these reasons, the Environmental Intervenors request that the Board deny the Petition, or, in the alternative, request PSE&G waive its right to invoke FERC backstop authority if a decision is not made within one year. Environmental Intervenors ask that the Board request PSE&G to submit a further analysis with current data from the factors listed above. If the Board approves the Project, the Environmental Intervenors request the Board to impose the following conditions:

1) That PSE&G not begin construction unless and until the Project receives all necessary federal and state approvals;
2) That PSE&G must resubmit a petition if FERC's cost allocation increases the cost to ratepayers;
3) That PSE&G must resubmit a petition if the 2010 Load Forecast shows additional decreases in load in 2010 and 2011;
4) That an analysis based on the next RTEP using updated econometric data be required to show that the Project and projected in-service date remain unchanged; and
5) That a proper leakage analysis in accordance with the Board's Leakage Order be completed, to allow the Board to better ascertain how the construction of the Project will affect the State's ability to comply with RGGI requirements.

G. Rate Counsel

In its initial brief, Rate Counsel contends that PSE&G must use current data to establish the Project is reasonably necessary for its customers. Specifically, Rate Counsel argues PSE&G is using stale load forecast data and has failed to provide a current study that incorporates the major factors that have occurred since the need for the line was initially identified in 2007. Rate Counsel argues PSE&G has only presented transmission solutions for the claimed reliability concerns, and no additional alternatives were considered.

Rate Counsel states there is no relevant case law interpreting N.J.S.A. 40:55D-19, but there are cases which interpret the substantially similar predecessor statute, N.J.S.A. 40:55-50. Rate Counsel sites the principles set forth in In re Public Service Electric and Gas Co., 35 N.J. 358 (1961). Rate Counsel also notes that N.J.A.C. 14:5-7.1 provides the requirements for when an electric distribution company ("EDC") constructs electric transmission lines. Rate Counsel states the Board must apply State law, regulations and Board precedent to govern the outcome of this proceeding.

Rate Counsel states that, according to the RTEP, the PJM Load Forecast Model incorporates three classes of variables: 1) calendar effects, such as day of the week, month, and holidays; 2) a forecast of baseline economic conditions; and 3) weather conditions across PJM. For the econometric component of its forecast model, PJM has contracted with an outside vendor that uses Gross Metropolitan Product (GMP), which allows for a localized treatment of economic effects within a zone.

Rate Counsel states the peak load forecast used as part of the modeling assumptions for the RTEP was created prior to the current economic recession. Since then, a major change has taken place over the last twelve months regarding the demand for electricity, with an accompanying effect on the peak load projections underlying the Company's claims that the Project is needed to serve the public. Rate Counsel argues this rapidly-changing economic environment demands that the most current data available be included for the Board to consider in this proceeding.

Rate Counsel states the evidence presented in support of the need for the line failed to incorporate three major factors. First, PSE&G's baseline need analysis does not capture any economic data more recent than the final quarter of 2008, and does not account for the unusually severe economic downturn. Second, PSE&G's analysis does not include demand response and energy efficiency resources that cleared the May 2009 Auction. Third, PSE&G has failed to take into account the New Jersey initiatives to substantially reduce peak load. Rate Counsel specifically points out that PSE&G did not account for a four-year $46 million dollar program intended to help customer curb energy consumption that was approved in November 2008, and also that PSE&G did not account for a $105 million solar loan energy pilot program.

Rate Counsel argues the Board must address merchant transmission projects that are designed to send power from New Jersey to New York. Rate Counsel points out that PS Power, the unregulated affiliate of PSE&G, will make the future decision of whether it might withdraw the Bergen 2 generating unit from PJM, since that unit is only committed to PJM until May 31, 2013. The Board should carefully examine the need for this Project to determine if it is really necessary or if it is serving the economic demands of the unregulated Company affiliate.

Rate Counsel states the Board must either deny the Petition outright or, if PSE&G is willing to voluntarily consent, the Board should hold it in abeyance until a current load study is produced for consideration.

Rate Counsel also argues PSE&G had the burden of establishing that the Project protects the welfare of the public. Rate Counsel argues the Board must practice "prudent avoidance" with respect to EMF issues and states that the Board must be satisfied that the Project's EMF is within permitted levels. The Project should be located so that it is as far away from any schools or habitations as possible. Rate Counsel also recommends that the Board retain jurisdiction

over the Project to ensure that the Company follows these guidelines if the Board determines to approve the Petition.

Rate Counsel submits the Board should not approve the instant Petition on this evidentiary record. Instead, Rate Counsel recommends that PSE&G: (1) further waive its right to invoke FERC transmission siting authority if a final decision is not made by this Board within one year of PSE&G's Petition filing date, and (2) submit a current load analysis incorporating an updated peak load forecast, the results of the 2009 RPM auction, and peak load reductions resulting from the New Jersey EMP.

Rate Counsel states that if the Board, upon further consideration of the updated analysis, approves the project, then the Board should require PSE&G to:

1. Construct the proposed Project in accordance with all environmental guidelines including, but not limited to, the Avian Protection Plan and Mitigating Bird Collisions with Power Lines Guidelines;
2. Relocate or realign portions of the Project to minimize any electromagnetic effects upon humans;
3. Relocate any portion of the Project so as to minimize its appearance with the topography;
4. Paint all structures of the Project the "Valley Green" color so as to camouflage their appearance as much as possible;
5. Demonstrate that it has obtained all permits required to construct and operate the Project, including those required by federal law and regulations to route the line through the Highlands and the Delaware Water Gap National Recreation Area; and
6. Provide a listing of all costs related to this proceeding for review by the Board.

V. POST-HEARING REPLY BRIEFS

A. PSE&G

PSE&G states that, as a general matter, the intervener briefs are replete with unsupported allegations and mischaracterizations that ignore the actual record.

PSE&G argues that, given the extent of the planning violations that have been fully identified and documented in the record, the need for this Project has been conclusively demonstrated and there is no reason or support in the record for the Board to wait for any further PJM analysis or updated information. PSE&G states the need has been demonstrated through three analyses, including one that fully reflected the effects of the economic downturn that commenced in 2008. And in any event, says PSE&G, up-to-the minute data will never be available at the time a decision must be made, as the available data will always relate to a period some number of months in the past. PSE&G states that in the unlikely event that another analysis demonstrates that the Project can be safely delayed or is no longer needed, PJM and PSE&G would abide by that determination.

PSE&G states the intervenors continue to falsely allege that PJM overlooked or intentionally ignored the impact of the recent economic downturn. In response, PSE&G states the March 2009 Retool did take it into account, as evidenced by the fact that it reflected a large demand decrease. PSE&G also states the intervenors seek to obscure the significance of the March 2009 Retool by proffering a substantial amount of irrelevant data in an attempt to suggest that

load has dropped during 2009 to levels that were wholly unanticipated in the January 2009 load forecast. PSE&G states the demand data provided by the intervenors relates to energy usage and not to peak load, and is therefore irrelevant to the RTEP process. PSE&G states that PJM must plan the transmission system based on weather normalized peak load, not energy usage. With that understanding, PSE&G contends that the January 2009 load forecast projected a 1.4% decline in the 2009 weather normalized peak load, which is in line with the actual 2009 weather normalized peak reduction of 1.9%.

PSE&G states the intervenors argument regarding a decline in Gross Domestic Product ("GDP") is without merit. PSE&G states the January 2009 load forecast took into account the anticipated decline in GDP in projecting peak load and that the intervenors ignore the recent upturn in GDP.

PSE&G contends that other data related to congestion, energy prices, energy company earnings, transmission loading relief ("TLR"), reserve margins and similar data is irrelevant because it does not impact reliability assessments, nor is it used in the process that determined the need for the Project.

PSE&G states the delay or cancellation of other RTEP projects, or portions of other RTEP projects, as a result of the decline in the load forecast does not suggest that this Project should also be cancelled or delayed. PSE&G states that these circumstances only demonstrate the bona fides of the RTEP process because the very same reduced load forecast that caused delay and/or cancellation of other RTEP projects continues to demonstrate a need for the Project and that this underscores the need for Project.

PSE&G argues the RTEP process does appropriately take into account energy efficiency and demand response. PSE&G states that these technologies are modeled in the RTEP process when they are verifiable and can be counted on for planning purposes. PSE&G states that, because PJM bears ultimate responsibility for compliance with NERC planning criteria and for the reliability of the transmission grid, it can reasonably take into account resources that have been firmly committed through the RPM process, or through the execution of an Interconnection Service Agreement ("ISA"). Additionally, neither PJM nor PSE&G has the authority to require that these resources be made available at the appropriate times and in the appropriate locations. PSE&G also renews its argument that demand response cannot resolve the ten Category C double circuit tower line contingency violations.

PSE&G states that, in light of the difficulties in developing new generation and the fact that the overwhelming majority (85%-88%) of projects that enter the interconnection queue are ultimately abandoned, new generation cannot be reasonably factored into transmission planning until it has signed an ISA. For transmission planning, prudency requires a generator's contribution to increased load on transmission facilities to be considered earlier in the interconnection process.

PSE&G argues that the aggressive goals set in the EMP are primarily geared to 2020, far past the time of the first NERC violation expected in 2012 and that it would be imprudent to expose customers to the potentially catastrophic consequences of transmission failures based on goals that the EMP itself recognizes are aggressive, experimental and untested. PSE&G states that, to the extent the EMP is successful going forward in moving towards achievement of its goals, the resulting resources will be appropriately taken into account in future RTEPs.

PSE&G states that other alternatives, including a different 500 kV line or a 230 kV line or reconductoring are simply not robust enough to address the myriad of violations at issue here, whether the initially-identified violations or those remaining after the March 2009 Retool.

PSE&G contends that certain intervenors advance arguments about reactive power asserting the Project will exacerbate reactive power concerns. PSE&G states such arguments are based on the testimony of a non-engineer with no experience in operating or planning a transmission system and have no bearing on this Project. PSE&G states these arguments have been directly contradicted by the clear and unequivocal expert testimony of Mr. Khadr and the PJM witnesses.

PSE&G states the Project will reduce the need for reactive power because it will add charging to the system that will increase reactive power and contribute to voltage stability.

In response to the intervenors arguments that this Project is really about increasing west to east coast transmission of electricity primarily generated by coal-fired plants, PSE&G states such claims ignore the fact that PJM operates on a not-for-profit basis.

PSE&G states the discussions regarding the number of hours in the past during which certain thresholds have been exceeded are of no significance, as the RTEP process is a forward-looking process that, by design, is geared to resolving future reliability concerns, not historical problems.

PSE&G states that assertions regarding merchant transmission and attempts to cast negative insinuations about PSE&G's unregulated power affiliate are equally without merit, as the structure of today's energy markets allows for merchant transmission. PSE&G also states that it is not involved in decision-making with its affiliates to provide power outside or inside the PJM region but that its affiliates have consistently incurred obligations to supply basic generation service ("BGS") load within New Jersey and have committed generation output as part of the RPM Auction process.

PSE&G states the Intervenors argument regarding "Project Mountaineer" completely disregards the testimonies of Mr. Khadr and Mr. Herling that the PJM Project Mountaineer initiative was totally unrelated to the Project and, in fact, was never advanced beyond one working group meeting resulting from a FERC technical conference held over four years ago.

With regard to leakage, PSE&G claims there is absolutely no evidence in the record questioning the merits of PSE&G's leakage analysis and no other party exercised their rights to perform a leakage analysis of their own.

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PSE&G argues the Seventh Circuit's decision in Illinois Commerce Commission, et al. v. F.E.R.C., 576 F. 3d 470 (7th Cir. 2009), has been mischaracterized and has no bearing on this proceeding. PSE&G states the issue of cost recovery is not relevant to the assessment of the need for the Project, which is based on the reliability concerns set forth in the record and discussed in PSE&G's initial brief and in this reply brief. PSE&G argues that, in any event, PJM's existing cost allocation method has not been "dismantled" as suggested by the intervenors; rather, the decision requires only that FERC make a reasoned decision based upon substantial evidence in the record to support its initial determination.

PSE&G argues that utilizing the existing ROW proved to be the best alternative for minimizing impacts to the public in addition to being wholly consistent with the Board's governing

regulations. PSE&G hired the Louis Berger Group to prepare the ARI which identified Route B as the route minimizing the effect of the transmission line on all factors of the natural and human environment, while avoiding unreasonable and circuitous routes, extreme costs, and non-standard design requirements to the maximum extent possible.

PSE&G argues this approach comports with the Board's regulations, which require an electric utility company to use existing rights-of-way wherever feasible when constructing a new transmission facility. N.J.A.C. 14:5-7.1(a)(1). PSE&G states that it would have been imprudent, and inconsistent with New Jersey regulations, for PSE&G to ignore an existing ROW as it prepared to design a new transmission line.

PSE&G states the record is completely devoid of any evidence suggesting that this Project will have any impact on property values. PSE&G also strenuously objects to any condition of approval requiring PSE&G to purchase homes adjacent to the ROW. PSE&G states the ROW pre-exists virtually all of the residences within 200 feet of the ROW.

PSE&G argues that, despite intervener's allegations to the contrary, the Project has not changed and all refinements have been made to minimize impacts of the Project and promote the welfare of the public. PSE&G states that it should not be penalized for looking for ways to address public concerns.

In response to the Municipal Intervenors argument that the revised tower and access road locations violate certain evidentiary rules due to their late submission, PSE&G states it is entirely appropriate during the process of obtaining approval under N.J.S.A. 40:55D-19 for the utility to continually work to minimize impacts associated with the project where appropriate. In re Public Service Electric and Gas Company Pursuant to N.J.S.A. 48:3-17.6 for the right to exercise eminent domain, 100 N.J. Super. 1, 10 (App. Div. 1968). Requiring a utility to amend its application every time it seeks to make a refinement to a project in response to public input would have a chilling effect on the applicant's willingness to incorporate public input into the project in the first place. PSE&G states that in Public Service II, the BPU did not even require the entire route to be finalized before granting the utility condemnation authority for a new 500kV line. The Appellate Division noted that the BPU did not require exact locations of towers or access roads when it approved condemnation authority for the 500kV project.

PSE&G states that building the switching station in the Borough of Hopatcong rather than the Township of Jefferson would significantly reduce the impacts to the environment. With respect to the alternative location of Roseland, PSE&G states that, although the intervenors allege the alternative location has not been thoroughly explained and final detailed engineering drawings have not been supplied, none of the parties argue that the station should not be located in Roseland. Furthermore, locating the new switching station equipment at the existing Roseland facility would be an appropriate action in reducing Project impacts

PSE&G notes it is still willing to build the switching stations in the Townships of Jefferson and East Hanover, but that it should not be penalized for working with the public in an effort to minimize impacts associated with the Project by relocated the switching stations. PSE&G states that penalizing them would chill an applicant's willingness to work with the public to minimize impacts of a project seeking N.J.S.A. 40:55D-19 approval.

PSE&G argues that the concerns raised about EMF, including allegations that somehow magnetic field levels above 3-4 mG pose a health issue, are not only unsupported in the record in this proceeding but are contrary to thirty years of scientific examination of EMF.

PSE&G states that moving the line a few hundred feet to the southwest of the Lazar Middle School, as recommended by the Montville BOE, would place the Project along gas transmission rights-of-way and would impact at least four additional property owners. It would increase the environmental impacts. PSE&G reiterates that building the Project on the existing ROW in this location would pose no health risks.

PSE&G concludes that the clear and convincing evidence in the record provided in testimony from Dr. Bailey and supported by national and international health agencies establishes that EMF does not pose any risk to public health. PSE&G also concludes that WHO and the NIEHS do not recommend setting any limit for exposure to magnetic fields, while the ICNIRP recommends an exposure level of 833 mG – well above anything modeled for this Project. PSE&G also concludes that the EMF levels associated with this Project are in the range of levels expected around everyday appliances.

B. Montville BOE

The Montville BOE anticipates a school addition to the Lazar Middle School in the next few years. If the Project is approved, the nearby towers should be relocated and/or realigned to increase the distances between the towers and school property to maintain safe and prudent EMF exposure levels.

The Montville BOE also finds PSE&G's reliance on charts of EMF levels in household appliances to be irrelevant because exposure as a result of the use of such appliances would be short term, as opposed to the EMF levels that would persist continuously while children are in school. Montville BOE further argues that the Company has not taken prudent steps to reduce harmful EMF exposures. Additionally, it contends that, consistent with its obligation of prudent avoidance, PSE&G has the ability and obligation to remedy these safety concerns.

Montville BOE requests that the Board deny PSE&G's Petition; but, should the Board approve it, it requests that PSE&G be ordered to relocate and/or realign the tower locations away from the school.

C. Municipal Intervenors

The Municipal Intervenors argue that the Board should deny the Petition and retain jurisdiction on this matter so as to give PSE&G the opportunity to re-file once updated data and better public information on the changes made to the Petition are available. In the alternative, the Municipal Intervenors recommend the Board defer a vote and require PSE&G to make certain submissions in the context of these proceedings.

The Municipal Intervenors point out that at least ten of the initially identified reliability violations evaporated after the March 2009 Retool. Yet, in August 2009, the number of projected violations surged again to the original number of 23 because PJM added ten never before considered category C double circuit tower contingencies. The Municipal Intervenors point that category C violations do not, alone, justify the construction of a transmission line. In fact, NERC standards consider double circuit tower contingencies very improbable and hence allow load curtailments to mitigate for such events.

Additionally, Municipal Intervenors argue that PJM's use of weather data is questionable because the results of one of the two tests PJM utilizes in its peak load forecast was not

included in the 2006, 2007, 2008 or 2009 forecasts. They believe PSE&G failed to give adequate consideration to decreased energy consumption or the goals of the EMP.

Furthermore, Municipal Intervenors argue the PSE&G evidence regarding the impact the Project will have on property values is not reliable and should be disregarded.

The Municipal Intervenors assert that PSE&G admits to having not performed any appraisals, surveys or property value studies to support its statement that values for properties located along the ROW will not be diminished or negatively impacted. The Municipal Intervenors request that the Board not consider the real estate evaluation testimony of PSE&G's Manager of Corporate Properties because he does not have sufficient credentials under N.J.S.A. 45:14F-21 to provide an opinion on the impact of the Project on property values since he is not a licensed appraiser. If the Board was to consider PSE&G's witness opinion, the Municipal Intervenors argue that an expert opinion must be based upon factual evidence. Since PSE&G has not conducted any appraisal study to evaluate the impact of the Project, its witness did not have sufficient data to support an expert opinion.

Should the Board agree to approve the Project, the Municipal Intervenors argue the Board should impose the following conditions:

1. Order PSE&G to ensure that the fire and safety officials of municipalities in which the two substations will be located, as well as surrounding municipalities, are adequately trained and have the proper equipment to respond to fires and other emergencies at the substations;

2. Order PSE&G to work with local officials to ensure that local protections for sensitive areas are respected and to be responsible for damages resulting from its activities in sensitive areas;

3. Order PSE&G to establish an escrow account or post bond sufficient to ensure that landowners suffering damages during construction or afterwards, either attributed to PSE&G or its contractors, will see their cases addressed promptly through correction, rehabilitation and compensation;

4. PSE&G must not be permitted to proceed with the Project until an acceptable cost-allocation scheme is in place. If the new scheme increases the cost of the Project to New Jersey ratepayers, PSE&G should be required to re-submit its Petition;

5. PSE&G must establish a "hot line" or other system through which any resident experiencing problems with construction and operation of the Project may obtain relief;

6. PSE&G must not be permitted to initiate construction until it has received all applicable federal and state reviews and approvals;

7. PSE&G must submit the 2010 load forecast data to the Board and in the event that the data show continuing load decreases for 2010 and 2011, PSE&G should be required to re-submit its Petition based on the updated data;

8. PSE&G must submit data from the 2009 RTEP to show that the number and estimated dates of projected reliability violations remain unchanged;

9. PSE&G must re-analyze the Project to include the policy goals of the New Jersey EMP;

10. PSE&G must present a fair and equitable compensation plan for property owners on or abutting the ROW who wish to relocate and, in the event of disagreements, the Board should assist in the negotiations.

D. Stop the Lines

Stop the Lines states that electricity will be going farther east into New York and states that the Project will increase leakage.

It argues that PSE&G and Exelon make reliability claims and threaten blackouts, but fear-mongering based on unrelated utility operation errors does not demonstrate need and does not refute the demonstration in the record that the need has evaporated due to plummeting demand for electricity. Stop the Lines states that like the MAPP and PATH projects, PSE&G should be required to produce updated sensitivity studies.

Stop the Lines contends that, with each new RTEP and/or retool released by PJM, the claimed contingencies have lessened in number and severity. It also states other indicators of potential for system overload have also lessened such as demand, congestion, and price. It also notes the drop is reflected in the 2010 PJM Load Forecast. It states the 2010 PJM forecast is inexplicable and contradicted by the 2009 NERC Reliability Assessment.

Stop the Lines contended that PSE&G did not adequately consider alternative routes and it has determined to construct the Project in a 150 foot ROW, despite its own admission that a 200 foot ROW is ideal. It believes this will cause increased exposure to EMF, financial risks of living near a transmission line, a physical danger to those who live next to the line, and an economic risk to all ratepayers.

Stop the Lines questions whether the Project will be safe and within the parameters of New Jersey Audible Noise Requirements if the size of the bundle has been reduced from a quad bundle to a tri-bundle. It also states the EMF levels expected from this Project are not known.

It request the Board dismiss the Petition without prejudice, or in the alternative, deny the Petition for failure to meet the burden of production and burden of proof.

With respect to its request to have an updated need analysis completed, Stop the Lines states a sensitivity analysis must include, but not be limited to those scenarios Ordered in the PATH docket. Lastly, Stop the Lines states that, if the Board chooses to approve the Petition, the following conditions to protect landowners, nearby residents, and the environment should be included:

1. PSE&G shall not begin actual construction unless and until it receives all necessary federal and state approvals, including those required by federal law and regulations necessary to route the line through the Highlands and the Delaware Water Gap National Recreation Area.

2. PSE&G shall not begin actual construction unless and until it receives all necessary state approvals.

3. Petitioner shall construct the proposed Project in accordance with all environmental guidelines including, but not limited to, the Avian Protection Plan and Mitigating Bird Collisions with Power Lines Guidelines;

4. Petitioner shall relocate or realign any portion of the Project to minimize any electromagnetic effects upon humans, i.e. route lines further away from residences wherever possible, provide sufficient ROW to allow for a safe "fall zone" for 195' high structures.

5. Petitioner shall assure magnetic field levels at ROW edge at all times are at or lower than PSEG produced Exhibit 135, S-ENR-35.

6. Petitioner shall provide modeling for substations and transmission lines and assure that noise shall at all time be below limits set by New Jersey code through continuous monitoring.

7. Petitioner shall address adjacent resident's requests to slightly move towers, and/or move out of neighborhoods where possible.

8. Petitioner shall locate any portion of the Project so as to minimize its appearance with the topography;

9. Petitioner shall paint all structures of the Project the "Valley Green"28 color so as to camouflage their appearance as much as possible;

10. Petitioner shall establish an escrow account, or require a bond be posted, sufficient to assure that if landowners suffer any structural damage, drainage, well problems or other issues during construction or afterward, attributable to PSEG and/or its contractors, that those issues be addressed promptly through correction, rehabilitation and compensation.

11. PSE&G must offer a choice of at least the following alternatives to homeowners that have an easement with PSE&G or have a home, business or other structure located within 200' of the edge of the ROW. These options would give landowners a choice to either stay or if they wish, try to sell their homes, without the financial risk and harm if no compensation were offered:

    a) One option for landowners who want to leave, PSE&G would offer to purchase the homes of any people along the line at "fair market value" plus 25%, and PSE&G would resell the home within two years. PSE&G would purchase the home; or modify/update the easement language to include specifics regarding EMF encroachment onto property, and resell the home with full disclosure regarding EMF. Property value should be based on the same formula PSE&G used when purchasing the house on Route 94 under the lines and the homes on Larikat Lane. There should also be a relocation premium set at 25% of the value of the home;

    b) Another option for landowners who want to leave is for PSE&G to find a "like kind and quality" home for willing sellers, which may be less cumbersome in some instances, but difficult in rural areas;

c) For landowners who do not wish to relocate and are willing to stay, PSE&G shall offer to compensate them for the drop in property value that would occur if this project is built – 25% or more. As above, value would be based on the formula PSE&G used in purchasing home on Rt. 94 and Larikat Lane;

d) The premium payment of "value" + 25% is to provide all, including those who are upside down on their mortgage, a downpayment for another home;

e) A formal complaint process shall be established at the Board of Public Utilities to hear and address any problems with PSE&G related to this transmission line.

12. PSE&G shall provide all parties with a detailed itemized listing of all costs related to this proceeding for review by the Board.

13. Approval shall be conditional on FERC approved cost allocation.

14. Permit shall be held in abeyance until such cost allocation is approved.

15. Petitioners shall submit a revised petition if FERC's cost allocation increases the amount allocated to New Jersey ratepayers for New Jersey and/or Pennsylvania portion of project.

16. Petitioner shall withdraw Petition if the 2010 Load Forecast and 2009 State of Market Report shows continued decreases in load in 2010.

17. Susquehanna-Roseland capacity shall not exceed 1,700 amps and/or 3,005 MVA, roughly that declared in record of proceeding.

18. Petitioner shall conduct an analysis based on the next RTEP using updated econometric data to demonstrate that the line and the projected in-service date remains unchanged.

19. Petitioner shall conduct a proper leakage analysis, for a time-frame at least as far into the future as the useful life of this project (35-50 years), in accordance with the Board's Order to allow the State to better ascertain how the construction of the line will affect its ability to comply with RGGI requirements.

E. Environmental Intervenors

The Environmental Intervenors argue that there should be a new review and consideration of the need for the Project as a result of the developments with respect to the PATH project, the delay of decision for the Pennsylvania portion of the Project, and the 2010 PJM Load Forecast.

Environmental Intervenors refute Exelon's argument that the risks are too great for a "wait and see approach" by identifying that PJM's witness, Mr. Herling, admitted during the hearing that the planning process is, by its nature, a "wait and see" process. If that is case, say the Environmental Intervenors, the same approach should be taken to determine if additional energy efficiency, demand response, and distributed generation projects will alleviate the alleged violations.

They contend that the March 2009 Retool did not fully take into account load reduction as a result of the economic recession because it included no data more recent than the last quarter of 2008. Nonetheless, the 2009 Retool showed a significant change in the number, timing, and severity of the alleged violations.

The Environmental Intervenors find PSE&G's argument that the Project will enable renewable generation resources to benefit customers in PJM to be disingenuous. PSE&G has stated that the Project is not intended to deliver any one specific generating source or to promote the future development of any one source; however, PSE&G then goes on to allude to 44,000 MW of wind generation in the PJM queue to bolster its argument that the Project will enable renewable generation resources to benefit PJM customers. These statements are contradictory and, in any event, incorrect, because 2008 PJM Reserve Requirement Study indicates that for the delivery year 2012/2013, the capacity of wind in the PJM RTO fleet represents .5% of the total, while fossil fuels represent 47.9% of the total.

Furthermore, the Environmental Intervenors argue that the PJM process is broken, and that the Board's comments filed with FERC in the matter of Transmission Planning Processes under Order No. 890 – Notice of Request for Comments, FERC Docket No. AD09-8-000 indicates the Board's concurrence with that argument.

The Environmental Intervenors argue that the CETO analyses are based on arbitrary and overly stringent assumptions. They raise issues regarding the CETO/CETL analysis and state that PJM did not perform CETO/CETL analysis for the years 2012 through 2022 for the Northern PSEG, PSEG, EMAAC, and MAAC LDA with and without the Project in service. Similarly, PJM did not perform this analysis for all new projected transmission export capacity to New York.

The Environmental Intervenors state that PJM uses the Mid-Atlantic region only instead of the entire RTO to determine CETO. The Environmental Intervenors also state that PJM uses a 1-day-in-25 year resource adequacy criterion for the Mid-Atlantic region, while it uses a 1-day-in-10 year resource adequacy criterion for the PJM RTO. The Environmental Intervenors state that this criteria is not mandated by NERC or any other external authority and that employing it makes the CETO extremely conservative, leading to increased CETO values. The Environmental Intervenors state that PJM should be required to perform the CETO/CETL analysis discussed above before the Board can determine whether the Project is reasonably necessary.

The Environmental Intervenors then go on to argue that, assuming the Petition is granted, the Board must condition such approval on receipt of all necessary approvals and prohibit commencement of construction until all approvals are received.

F. Rate Counsel

In its Reply Brief, Rate Counsel requested the Board to deny PSE&G's petition at this time and have the Company submit a current load analysis incorporating an updated peal load forecast, the results of the May 2009 Auction, and peak load reductions resulting from the EMP. Rate Counsel relied on the withdrawal of the MAPP and PATH projects as indication that a new analysis was necessary.

VI. DISCUSSION AND FINDINGS

The applicable standard to be applied in this matter is set forth in N.J.S.A. 40:55D-19, which states that a public utility proposing a multiple-municipality project may petition the Board and that if, after hearing on notice to interested parties, the Board finds that "the present or proposed use by the public utility …of the land described in the petition is necessary for the service, convenience or welfare of the public… and that no alternative site or sites are reasonably available to achieve an equivalent public benefit, the public utility … may proceed in accordance with such decision of the Board of Public Utilities, any ordinance or regulation made under the authority of [Municipal Land Use Law] notwithstanding."

The courts of this State have interpreted the standards set out above. Preliminarily, it should be noted that the Board's obligation in making such a decision is to weigh all the interests and that, in the event the interests are equal, PSE&G should be entitled to preference because the legislative intent is clear that the broad public interest to be served is greater than local considerations. See In Re: Public Service Electric & Gas Company, 35 N.J. 358, 377 (1961); In Re: Monmouth Consolidated Water Co., 47N.J. 251 (1966); In Re Application of Hackensack Water Co., 41 N.J. Super. 408 (App. Div. 1956).

The Board further notes the applicable legal principles established In Re Public Service Electric & Gas Co., 35 N.J. 368 (1961):

1) The phrase "for the service, convenience and welfare of the public" refers to the whole public served by the utility and not the limited group that benefits from the local zoning ordinance;
2) The proposed use must be reasonably, not absolutely or indispensably, necessary for the service, convenience and welfare of the public;
3) The particular site or location must be found to be "reasonably necessary" and so the Board must consider the community zoning plan, the physical characteristics of the site, and the surrounding neighborhood;
4) Alternative sites and their comparative advantages and disadvantages, including cost, must be considered in determining reasonable necessity; and
5) The Board must weigh all interests and factors in light of all of the facts, giving the utility preference if the balance is equal, because the legislative intent is clear that the broad public interest is greater than local considerations.

A. Need for the Project

1. PJM and the NERC Criteria

Following the occurrence of the August 14, 2003 blackout, and subsequent investigations undertaken to determine the cause of the blackout, the United States Congress passed the Energy Policy Act of 2005 ("EPAct 2005").[21] The EPAct 2005 added Section 215 to the Federal Power Act ("FPA"), which required the FERC to certify an Electric Reliability Organization ("ERO") to develop mandatory and enforceable reliability standards.[22] On February 3, 2006, FERC certified NERC as the ERO. The NERC transmission planning reliability standards

[21] 42 U.S.C. §16511-14 (2009).
[22] 16 U.S.C. § 824o(e)(3).

became mandatory in 2007.[23] Failure to comply with the standards can result in penalties of up to $1 million per day per violation.[24]

PJM is the designated RTO that ensures the reliability of the electric transmission system under its functional control and coordinates the movement of wholesale electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. As reflected in Mr. Herling's testimony, the PJM system serves approximately 51 million customers and has dispatch capability of more than 164,000MW of generation capacity over more than 56,000 miles of transmission lines – a system that serves nearly 20 percent of the United States economy.[25]

As the designated RTO, PJM must comply with approved NERC reliability standards.[26] NERC reliability standards apply to the "bulk electric system," which generally includes transmission facilities operated at voltages of 100 kV or higher. There are three categories of NERC reliability standards that are relevant to this proceeding.

NERC Category A requires that, with all facilities in service, equipment thermal ratings and system voltage levels be within applicable limits and that the system be stable.[27] To test for NERC Category A criteria violations, PJM evaluates the system with no contingencies.

NERC Category B requires that the system be evaluated with one facility removed from service, such as a transmission line, a transformer or a generator, the purpose of which is to ensure that the system continues to be reliable even with the instantaneous outage of a transmission or generation component. This is referred to as the "n-1" criteria or single contingency test. For Category B load deliverability tests, PJM assumes emergency peak load conditions for the area being tested and normal peak load conditions for the rest of the system. For Category B generator deliverability test, PJM assumes normal peak load conditions for the entire system.

NERC Category C criteria require the system to be stable and within applicable equipment thermal ratings and system limits under a variety of multiple facility contingency events. One example of a Category C event would be the loss of one system element followed by system adjustments and then the loss of a second system element. Category C criteria also include events such as the loss of two circuits on a single tower line, known as "double circuit tower line contingencies." These are referred to as the "n -1- 1" or the "n-2" criteria. In this proceeding, PJM has identified double circuit tower line contingencies that are the source of the Category C violations that contribute to the need for the line. Under the testing for this type of Category C violation, no system readjustments are permitted because both lines are removed from service at the same time. For Category C violations, PJM uses a normal peak load condition rather

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23 See e.g. *Mandatory Reliability Standards for the Bulk-Power System*, Order No. 693, FERC Stats. & Regs. ¶ 31,242 (2007); Order No. 693-A, reh'g denied, 120 FERC ¶ 61,053 (2007) (Order approving the first 83 NERC reliability standards and directing other related actions).

24 See also, *North American Electric Reliability Corp.*, 118 FERC ¶ 61,030 at P. 88 (2007). 16 U.S.C.A. 825o-1(b)

25 Exhibit P-11 at 6.

26 Petition at 11-12, 24; Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 11; Exhibit P-11 (Direct Testimony of Steven R. Herling) at 19-20; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 8-19 to 9-6.

27 Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 6-6 to 6-8.

than an extreme peak load condition reflecting that such events are less likely to occur than Category B events and that these events are not necessarily tied to weather conditions.[28]

2. RTEP Background

PJM's RTEP is an annual transmission planning process where all assumptions, analyses and decisions are subject to stakeholder review and participation. PJM's TEAC, which is open to interested entities or persons, is the primary forum for stakeholder input into the PJM analyses. In fact, Board Staff participates in the TEAC. PJM's RTEP integrates many factors, including:

a) Forecasted load growth, demand-response efforts and distributed generation additions;
b) Interconnection requests by developers of new generating resources and merchant transmission facilities;
c) Solutions to mitigate persistent congestion and forward-looking economic constraints and to ensure adequate allocation and funding of long-term financial transmission rights;
d) Assessments of the potential risk of aging infrastructure;
e) Long-term firm transmission service requests;
f) Generation retirements and other deactivations;
g) Transmission owner initiated improvements; and
h) Load serving entity capacity plans.[29]

PJM's RTEP process includes both five-year and fifteen-year planning horizons. The five-year planning analysis assesses compliance with reliability criteria and identifies transmission upgrades needed to meet customer demand growth. The fifteen-year analysis identifies developing trends that require longer lead-time solutions and examine the long-term reliability impacts of economic growth and assumptions about generation resources.[30]

PJM utilizes region-specific econometric data from Moody's when evaluating future load growth. PSE&G witness from PJM, Steven Herling, testified at the Supplementary Hearing that the econometric data is benchmarked with other sources, including Global Insight, to ensure accuracy. Nevertheless, while the Board HEREBY FINDS that PJM's use of Moody's econometric data, benchmarked by other sources, was reasonable, in the future, the Board and PJM may benefit from an analysis that incorporates a wider variety of econometric data.

Each RTO develops its own internal tests to evaluate compliance. PJM's RTEP uses two tests, a load deliverability test and a generator deliverability test, to evaluate its transmission system to ensure compliance with NERC standards. The Board does note that it may be worthwhile for PJM and NERC to consider developing a consistent standard test for RTOs to create continuity in the transmission planning process, and the Board will advocate as much going forward.

PJM's load deliverability test examines defined load zones within the PJM region and considers the ability of the transmission system to deliver adequate power to a specific load zone during peak conditions. In the load deliverability test, the specific load zone is tested at 90 / 10 emergency peak load conditions while the surrounding areas are at 50 / 50 load levels.[31] The 90 / 10 conditions simulate hot weather, with the forecast having only a 10 percent probability of

[28] Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 6-13 to 7-2.
[29] Exhibit P-11 (Direct Testimony of Steven R. Herling) at 15-16.
[30] Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 17-18; Exhibit P-11 (Direct Testimony of Steven R.Herling) at 22-24.
[31] 3T:607-14 to 608-3.

being exceeded by even hotter weather.[32] The 50 / 50 load represents moderate weather with the forecast having a 50 percent probability of being exceeded by hotter weather.[33]

The generator deliverability test evaluates the capability of the transmission system to deliver available generation resources to the remainder of the PJM system at peak load. Using a 50 / 50 peak load forecast in all areas, this test determines whether the transmission system is sufficiently robust to export additional generation in one area to other areas that require it.[34]

3. Need for the Project

The need for the Project stems from a series of RTEP analyses, as described above, that were performed by PJM beginning in 2007. Those analyses,indicated that there will be violations of the reliability criteria established by NERC over the course of the 15-year planning horizon. More specifically, the need for the Project was first identified in PJM's 2007 RTEP.[35] The need for the Project was then confirmed in the 2008 RTEP, which identified 23 NERC violations. The 2008 RTEP, which formed the basis for the need for the Project when the Petition was filed, identified two Category A violations and 21 Category B violations.[36] Although not included in the original Petition, the 2008 RTEP also included 27 Category C violations.[37]

As a result of the national economic downturn, PJM conducted a third analysis in March 2009 (referred to as the March 2009 Retool), which also showed 23 reliability violations starting as early as 2012. More specifically, the March 2009 Retool estimated that, over its 15-year planning horizon (ending in 2022), 13 different bulk transmission lines are expected to be overloaded due to NERC Category B violations. With respect to the Category B violations, PJM projected that violations would occur on two bulk power lines by 2012 with an additional three lines exceeding NERC Category B criteria over the following three years (2013-2015). Over the entire forecast period through 2022, of the thirteen category B violations, twelve of such violations would fail the load deliverability test and one violation would fail the generator deliverability test.[38] Additionally, ten different bulk transmission lines are expected to be overloaded due to the outage of two lines that are located on a common structure, or NERC Category C violations. The March 2009 Retool projected that NERC Category C violations would occur on five bulk power lines by 2012 with an additional four lines in violation of over the next three years (2013-2015). All the Category C forecast violations are due to failing the PJM generator deliverability test.[39]

4. Evolving RTEP Studies

The Intervenors have argued the "need" issue for the Project is a moving target, with studies changing over time. In other words, the intervenors have argued that the RTEP used different assumptions, which produced different results, since 2007.

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32 3T:607-18 to 607-23.

33 Exhibit SRTT-1 Load Forecast.

34 Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 7-11 to 9-6, and 3T:603-3 to 610-14.

35 Exhibit S-100 2007 RTEP Report dated February 2008.

36 Exhibit S-101 2008 RTEP Report dated February 2009; Exhibit PFM-1.

37 Exhibit S-89 SRTT-104 Violations.

38 Exhibit PFM-2 Chart of 13 Outages between 2012 and 2022 based on load and generator deliverability.

39 Exhibit PFM-3 Chart of 10 Outages between 2012 and 2022 based on PJM generator Deliverability.

Stop the Lines and the Municipal Intervenors argue that PJM has changed the analytical methodology with every successive data set introduced, using different assumptions, inputs and calculations, which produced different results. Stop the Lines argues that PSE&G has not acknowledged that the number and severity of the projected reliability criteria violations has decreased with each methodological improvement, or that the original violations put forward as justification for the Project have evaporated. The Municipal Intervenors argue that PSE&G introduced no less then four different data sets. Stop the Lines claims that it is impossible for the Intervenors and the Board to discern and apply the information necessary to inform the record and adequately address PSE&G's claim that the Project is needed.

The Environmental Intervenors note that the original petition relied upon exhibit PFM-1, which included 23 potential reliability violations, but that PSE&G included two replacement exhibits, PFM-2 and PFM-3, in their Rebuttal Testimony submitted on September 2, 2009. Environmental Intervenors believe that it is suspicious that PJM decided to add alleged NERC Category C reliability violations one month prior to the evidentiary hearings, after seeing the number of NERC Category A and Category B violations submitted with the petition decrease substantially. They also state that the NERC standards permit a certain level of load to be curtailed but that PSEG and PJM do not consider any loss of load acceptable. More generally, they argue that the justifications for the need of this Project have changed over time, and that the Board cannot approve the Petition unless it has a study that considers all relevant and current data.

In response, PSE&G argues that the intervenors mischaracterize the record by generally stating that the 23 criteria violations identified in the initial RTEP analysis have been reduced to 13 in the March 2009 Retool. PSE&G argues that these assertions willfully ignore the ten Category C violations identified in the March 2009 Retool. PSE&G also argues that the latest study accounts for the effects of the economic recession and still identifies 23 criteria violations, albeit of a different mix then the original analysis. PSE&G maintains that, regardless of the changes in the violations, there continues to be 23 violations and the need remains overwhelming.

PSE&G further argues that the number and severity of violations cannot likely be resolved with other solutions. PSE&G maintains, however, that it will abide by any future determinations made by PJM that the line can be delayed or is no longer needed on the previously proposed timeframe.

As was noted above, the 2008 RTEP, in which the original Petition relied upon, identified two Category A violations and 21 Category B violations.[40] The March 2009 Retool identified 13 Category B violations and 10 Category C violations.[41] During discovery, it was revealed that the 2008 RTEP unintentionally omitted 27 Category C violations.[42]

Despite the changing nature of the violations, the record is clear that PJM will be in violation of NERC reliability criteria in each analysis that was performed if appropriate steps are not taken to resolve the potential violations by 2012. The RTEP considers a number of drivers and inputs, many of which change over time, including load projections, generation availability, and demand response. Given the nature of transmission planning, changes and modifications as time passes is expected. In this case, due to the economic recession, the changes in load projections, along with other inputs, changed and reduced the number and type of violations

[40] Exhibit PFM-1.
[41] Exhibit PFM-2, PFM-3.
[42] Exhibit S-89, Response to Staff Discovery Request SRTT-104 Violations.

that were originally modeled in the RTEP. However, even when PJM included these changing drivers, which accounted for the economic recession, multiple reliability violations were still projected to occur beginning in 2012 and the Project remained the most robust solution to solve those reliability violations.

PSE&G has proven, through its own witnesses and the witnesses from PJM, that through each RTEP there continues to be reliability violations identified as early as 2012. In particular, the most updated analysis, the March 2009 Retool, shows two Category B and five Category C projected violations in 2012 with the Project not in service. Under the well-established legal principles for petitions brought to the Board under N.J.S.A. 40:55D-19, the Board must consider the welfare of the public in determining whether the Project is reasonably necessary. PJM has now performed three transmission planning analyses and each of them identified violations as early as 2012. The results of these violations and the associated potential system overloads could have significant negative impact on the public welfare of the citizens of this State in the form of significant damage to infrastructure, brownouts, or blackouts. Therefore, the Board HEREBY FINDS that, despite the changing nature of the violations, there has been competent evidence that reliability violations are still projected to occur as early as 2012 and that the Project is reasonably necessary for address those violations.

For reasons discussed in greater detail in the following section, it is highly unlikely that the 2009 RTEP or the 2010 RTEP will show a reduction in reliability violations or a significant delayed projected date for the reliability violations because the 2009 Load Forecast Report was almost identical to the 2008 Load Forecast Report. Nonetheless, the Board understands the intervenors concerns. Therefore, the Board HEREBY ORDERS that PSE&G notify the Board of the results of the next RTEP and, should there be a substantial delay or change in projected reliability violations, the Board shall take appropriate action.

5. Economic Recession

The intervenors argue that the need for the Project has been eliminated because of the recent drop in the demand for electricity and that PSE&G and PJM have made no effort to address the demand decrease, and deny it by not taken demand into account. Similarly, the Municipal Intervenors argue that decreased demand over the past two years is significant and cancels out all claims that the project is needed. They point to NERC's 2009 Reliability Assessment, which states that reduced economic activity and increased demand-side management have led to decreased projected peak demand for electricity and higher reserve margins throughout North America for much of the next ten years.[43] They point to the MAPP and PATH projects as examples of other backbone projects that have been delayed or withdrawn. Stop the Lines and the Municipal Intervenors also point to other metrics and reports that indicate the impacts of the economic recession on the electricity market, including decreased energy usage, the decreased cost of energy, the lack of congestion, reduced company earnings, reduced Locational Marginal Prices ("LMPs"), decreased Transmission Loading Relief, and increased reserve margins.[44]

The intervenors also argue that it is important to use a more current load forecast because the general downturn in the United States economy has been severe since the last quarter of 2008, when PJM's 2009 load forecast was developed. The Environmental Intervenors argue that PJM

[43] Stop the Lines Initial Brief at 15.

[44] Stop the Lines Initial Brief at 16-17; Municipal Intervernors Initial Brief at 63.

created its January 2009 Peak Load Forecast sometime during the 4th quarter of 2008, which represented only a fraction of the downturn that was to develop in 2009.[45]

Rate Counsel also argues that the peak load forecast used by PJM in its modeling assumptions was created prior to the current economic recession. They contend that a major change has taken place over the last twelve months regarding the demand for electricity, with an accompanying effect on the peak load projections. Rate Counsel, therefore, also requests that a current peak load forecast must be used in PJM's modeling before the Board can make a decision.

In response, PSE&G argues that PJM's 2009 Load Forecast Report fully reflected the impact of the recession that began in 2008, deepened in 2009, and was the largest ever seen by PJM.[46] PSE&G argues that, by the very nature of the RTEP process, up-to-the-minute data will never be available, and at some point a decision must be made as available data will always relate to a period some number of months in the past.[47] PSE&G believes that the various other metrics raised by the intervenors do not impact reliability assessments, and are not used in the process that determined the need for the Project. PSE&G also argues that the delays and cancellation of other transmission projects demonstrate the bona fides of the RTEP process, especially for the Project, since PJM has consistently confirmed its necessity.[48]

For the following reasons, the Board HEREBY FINDS that PSE&G did take the economic recession into consideration. The March 2009 Retool accounted for the effects of the economic recession that began in 2008. Although the intervenors have consistently argued that PJM has failed to account for the economic recession, the evidence presented during the course of the hearing shows otherwise. Most notably, the March 2009 Retool projected a drop in peak load, on a weather normalized bases, of 1.4 percent. The actual drop in peak load, on a weather normalized basis turned out to be 1.9 percent.[49] While the March 2009 Retool's load projection did understate the actual load reduction, the understatement is certainly not an indication of failing to take the economic recession into account.

Furthermore, in this case, the modeling of the Project with an updated load forecast projection, as argued by some intervenors, would not change the results of the analysis. As already stated, PJM accounted for the effects of the economic recession that began in 2008 in their 2009 Load Forecast Report. During cross examination at the supplementary hearing of February 4, 2010, PSE&G witness Steven Herling stated that the "[2010] peak load forecasts are almost identical to those included in the 2009 load forecast," and that "therefore, there will be no significant difference in the results of the 2010 RTEP by virtue of the change in load."[50] Therefore, using the 2010 load forecast report in an updated RTEP analysis, as argued by the intervenors, will not have any meaningful impact on projected reliability violations.

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45 Environmental Intervenors Initial Brief at 32.

46 PSE&G Initial Brief at 51.

47 PSE&G Reply Brief at 4.

48 PSE&G Initial Brief at 52.

49 See Exhibit 69 BKS-6 and http://www.pjm.com/planning/resource-adequacy planning/~/media/planning/res-adeq/load-forcast/summer-2009-pjm-scps-and-w-n-zonal-peaks.ashx<http://www.pjm.com/planning/resource-adequacy-planning/~/media/planning /res-adeq/load-forcast/summer-2009-pjm-scps-and-w-n-zonal-peaks.ashx>

50 6T 45:14-19.

The larger unknown regarding the load forecast is PJM's projection that the recovery from the recession will be fairly vigorous, and that demand will resume its historical trend as evidenced by a close examination of their 2009 Load Forecast Report. While this projection may be considered optimistic as to load growth, and thus conservative with respect to the factors affecting the need for the line, it is not beyond the zone of reasonableness. Furthermore, no evidence or alternate forecast has been introduced in this proceeding, and even more importantly, no party has shown that such a forecast would materially affect the need for the Project.

The following example illustrates the significance of some of the violations. When considering one of the forecast Category C double contingency violations, an outage of the Portland-Greystone 230 kV line and the Kittatinny-Pohatcong 230 kV line would result in the Kittatinny-Newton 230 kV line exceeding its emergency rating and overloading by 2012. The load on the line would exceed its emergency rating by 8%. It is difficult to conjure up what combination of reduced load or increased supply could reasonably be estimated to avoid an overload of that size. The fact that there have been three major blackouts related to transmission outages in the past 45 years in the Northeast necessarily puts the Board in a position of having to treat potential violations of reliability standards as far more than mere theoretical exercises.

6. Results of the May 2009 Auction

The intervenors argue that the results of the May 2009 Auction can delay or eliminate the need for the line. For example, the Environmental Intervenors and Rate Counsel argue that the level of demand response and energy efficiency that will be available based on the May 2009 RPM Auction has substantially increased in the area where PSE&G claims the Project is needed.[51] They cite to increases of over 1,000 MW in the eastern MAAC region from the amount that PJM used in its initial modeling of the Project.[52] They also point out that PJM did not analyze where and how much demand response would be needed to clear the RPM auction to alleviate the violations, but that PJM does have the ability to perform such a calculation. They contend that an examination of all transmission and non-transmission alternatives is impossible without a retool study that incorporates the demand response and energy efficiency that cleared the May 2009 Auction, in addition to an updated load forecast.[53]

In response, PSE&G argues that the resources from May 2009 Auction cannot resolve Category C violations and are not sufficient to address the substantial number of identified violations in the locations where the violations occur and in the time frame required.[54]

The Board concludes that incorporating the results of the May 2009 Auction into the next RTEP analysis will not have a significant impact on the projected reliability violations. Although there have been increases in demand response and energy efficiency that will be modeled in the next RTEP analysis, those increases will not impact the projected Category C violations. Such violations can occur during normal peak hours and demand response capacity is not required to be on call during normal peak periods. Demand response is only available for dispatch by PJM during emergency peak periods. Furthermore, even if demand response capacity were available during normal peak periods, it takes one or two hours to respond to PJM's dispatch, which would not be sufficient time to offset the Category C violations. Therefore, the increased

[51] Environmental Intervenors Initial Brief at 34, Rate Counsel Initial Brief at 7.
[52] Environmental Intervenors Initial Brief at 35, Rate Counsel Initial Brief at 7..
[53] Environmental Intervenors Initial Brief at 38.
[54] PSE&G Reply Brief at 12.

demand response that will be modeled in the next RTEP will not reduce the number, or push back the timing, of the ten Category C violations projected to occur.

Additionally, during the evidentiary hearing of February 4, 2010, witness Herling pointed out that while there was a significant increase in demand response capacity that cleared in the relevant zones, there was also a marked decrease in generation availability due to retirements in the relevant load zones.[55] Thus, the net increase in available capacity was relatively small. Mr. Herling also testified that it is unknown whether the net increase in available capacity would be enough to delay the projected Category B violations.[56] At most, any delay of the Category B violations projected to occur in 2012 would only be one or two years. However, the Category C violations are also projected to occur in 2012 and as explained above, these violations cannot be resolved with demand response. Nevertheless, as discussed above, because the Board understands intervenors concerns, it is ordering PSE&G to notify it of the next RTEP results to ensure that the Project remains needed, and on a similar timeframe.

For these reasons, the Board HEREBY FINDS that incorporating the results of the May 2009 Auction into the next RTEP will not have a significant impact on the projected reliability violations and that the Project will still be needed to address violations.

7. Alternatives

The intervenors argue that PSE&G failed to consider alternatives to the Project, or that the Company only meaningfully considered transmission alternatives. Similarly, the Municipal Intervenors argued that energy efficiency, load shifting, smart grid initiatives, and conservation policies were not considered.[57] The Environmental Intervenors note that PJM can only direct transmission construction and not the construction of generation and demand response, but that PJM made no effort to study the location and quantity of generation and demand response that would be required to alleviate the violations even though they have the ability to do so.[58] They also argue that PSE&G relied to its detriment on PJM because PSE&G, not PJM, has the responsibility to consider alternatives to transmission.[59]

PSE&G, on the other hand, contends that other transmission based alternatives were considered, including the Bossards-Roseland 500 kV line and the Stanton-Roseland 230 kV line, but that the Project was the preferred alternative to address the scope and magnitude of the violations.[60] PSE&G argues that PJM does not have the authority to require new generation or demand response in specific locations, as those solutions are market based.[61] PSE&G also argues that new generation and demand response that clears the RPM auction or executes an ISA is modeled in the RTEP.[62]

Alternative methods and their comparative advantages and disadvantages, including cost, must be considered in determining reasonable necessity. With respect to examining other transmission alternatives, the record is clear that PSE&G did consider other transmission

55 6T 39:20-22.
56 6T 112:21-25.
57 Municipal Intervenors Initial Brief at 60.
58 Environmental Intervenors Initial Brief at 54.
59 Environmental Intervenors Initial Brief at 55.
60 PSE&G Initial Brief at 42-43.
61 PSE&G Initial Brief at 46, 49.
62 PSE&G Initial Brief at 46.

solutions but they did not provide an adequate long-term solution to the violations.[63] Two other transmission solutions were considered; the Bossards-Roseland 500 kV line and the Stanton-Roseland 230 kV line. As indicated by PSE&G's witnesses, the Brossard to Roseland 500 kV line ultimately would provide less relief on the identified overloaded facilities over PJM's 15 year planning horizon. Furthermore, construction of that line would require outages of several 230 kV lines along the proposed route that would significantly affect reliability and congestion during the construction period.

Additionally, a Stanton to Roseland 230 kV line was considered, but that would have required construction of an entirely new line and would not have provided a sufficiently robust solution to the criteria violations, as many of the violations would only have been resolved for a few years.

Therefore, the Board HEREBY FINDS that PSE&G considered transmission alternatives to alleviate the NERC violations, but that none would provide a robust enough solution. The record in this matter is clear that the Susquehanna-Roseland 500kV project was chosen because it provided a robust enough solution that could resolve all of the projected reliability criteria violations. Thus, the Board HEREBY FINDS that the Company met its burden of evaluating transmission-based alternatives to the Project.

With respect to non-transmission alternatives, the record is clear that PJM does not have the authority to require new generation or demand response, and particularly cannot order it in specific locations. Generation and demand response are market based, and such resources are permitted, but not required, to enter into such markets.

Furthermore, the RTEP did account for generation and demand response that have responded to the PJM markets. In this sense, alternatives to transmission were considered because if enough generation and/or demand response responded to the PJM markets in the right places and at the right time, PJM would have modeled them into the RTEP and the projected reliability criteria violations would not have occurred. However, even assuming that demand response that was not modeled by PJM did show up prior to 2012, the Project will still be needed because, as discussed previously, demand response cannot alleviate the Category C reliability criteria violations identified here. Finally, it is highly unlikely that any significant generation could be constructed in the right place to alleviate the violations prior to 2012.

The Board agrees with the intervenors arguments that PSE&G, not PJM, has the burden to consider alternative methods. There is evidence in the record that PSE&G determined that solar photovoltaic projects would not be a viable substitute for the Project.[64] Mr. Khadr also testified that smart grid would not reduce electricity demand or consumption.[65] With respect to generation, the PSE&G witnesses testified as to the small amount of new generation being developed eastern PJM, and more specifically in New Jersey, and that a high percentage of generation that is in the PJM queue will drop out of the queue before being developed.[66] Also, PSE&G has explained that it is very difficult to site and build local generation in densely populated areas.[67] There currently is not sufficient generation in the queue that could potentially be available by 2012. In addition, as noted by Mr. Herling at the February 4, 2010 supplemental hearing, the generation available has actually decreased because of

63 3T 580:16-25 to 583:1-4.
64 Exhibit P-15, Rebuttal Testimony of Esam A.F. Khadr at page 7-8.
65 3T 593:10-25.
66 3T 596:11-25 to 597:1-7.
67 Exhibit P-1 25-26.

retirements.[68] Lastly, PSE&G has shown that they considered and rejected demand response as an alternative for all of the reasons noted above.[69] Therefore, the Board is satisfied that both PJM and PSE&G considered alternative methods. Thus, the Board HEREBY FINDS that this method is reasonable under the circumstances.

With that said, many of the criticisms made by the intervenors echo the suggestions made by the Board or its Staff over the past several years with respect to PJM's analyses. The Board has advocated that PJM give greater recognition to demand response and energy efficiency measures in its system planning and it appears that PJM has begun to do so. PJM has argued that, for purposes of planning, it can only recognize those measures that have effectively cleared the PJM auction. While this position may be conservative, the Board believes that taking a conservative position in reliability transmission planning is reasonable in this instance. Therefore, the Board HEREBY FINDS that PSE&G considered non-transmission alternatives, but that none provided a robust enough solution to the reliability violations.

8. March 2009 Retool

The intervenors argue that a more current retool study is needed before the Board can make a decision on the Project. They contend that significant changes, including the impact of the current economic recession, the results of the May 2009 Auction, New Jersey and Pennsylvania state peak load reduction initiatives, and other factors can address the potential reliability violations.[70] They believe the next RTEP study will include a more accurate and current 2010 Load forecast report. They go on to note that the May 2009 Auction includes substantial increases in demand response and energy efficiency for 2012 that should be modeled into the RTEP and that, until PJM incorporates the latest version of the Load Forecast Report, the May 2009 Auction, and the state initiatives, the Board cannot make a decision on the Project because PSE&G failed to carry its burden of proof to demonstrate that the Project is necessary. Additionally, Stop the Lines argues that a sensitivity analysis must be performed based on the changes in demand, congestion, line loading, and expected changes in forecasts, and delays, cancellation, and withdrawal of other projects before the Board can make a decision.[71]

An additional retool is not necessary for the Board to approve the Project. As stated above, the 2010 Load Forecast report is almost identical to the 2009 Load Forecast Report. Additionally, the demand response that cleared the May 2009 Auction is offset by generation retirements and cannot resolve the Category C violations, in any event. Finally, it is not unreasonable for PJM to omit the goals of the EMP and the objectives of PA Act 129 in the RTEP modeling until PJM has evidence that these goals and objectives are being met. Therefore, the Board FINDS that, at this time, another retool is not needed and would not change the need for the Project.

With that said, as noted above, in the unlikely event that the next RTEP or retool shows that the Project is not necessary or can be delayed significantly, the Board will retain the authority to reopen this proceeding.

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68 6T 39:20-22.

69 Exhibit P-15, Rebuttal Testimony of Esam A.F. Khadr at 5-7

70 Environmental Intervenors Initial Brief at 31.

71 Stop the Lines Reply Brief at 10.

9. Category C Violations

The Environmental Intervenors have argued that it is suspicious that PJM decided to add alleged NERC Category C reliability violations in support for the need for the Project after the number of NERC Category A and Category B violations, which were originally offered in support of the Project, substantially decreased in volume.[72] They contend that load shedding and/or generation rejection is permitted under Category C events because of a recognition that these double circuit tower contingencies are improbable events and allow for a certain level of load to be curtailed.[73] Thus, it is unclear why these events are even considered potential reliability violations. The Environmental Intervenors believe that, by considering any load loss to be unacceptable, PSE&G and PJM are using a more stringent standard than required by NERC in an effort to demonstrate the continued need for the Project.[74]

More particularly, the NERC planning criteria do not consider load loss through involuntary curtailment acceptable as implied by the Environmental Intervenors. The NERC planning criteria simply recognize that Category C events are less likely to occur and therefore permit PJM to take the undesirable operational action of involuntary load curtailment in order to reduce the likelihood of a widespread blackout. If the PJM operators can react quickly enough, PJM will not be penalized for violating the NERC standards. However, such quick operator action still involves a more localized blackout or brownout, which would likely be located in New Jersey. Planning based on emergency operator actions that require involuntary blackouts in New Jersey in order to retain the bulk power system in the rest of PJM is not the proper way to plan, nor does it serve the service, convenience or welfare of the whole public as required by In Re Public Service Electric and Gas Co., 35 N.J. 368 (1961). Furthermore, the Board's responsibility to assure safe, reliable, and adequate service for New Jersey does not permit such planning. Thus, the Board FINDS that planning for involuntary load curtailment during Category C events is not a reasonable alternative to the violations.

10. Generation Modeling

The Municipal Intervenors and Environmental Intervenors argue PJM's modeling of proposed generation to the transmission system produces inaccurate projections of reliability criteria violations and violates NERC Standard TPL-002. They contend that the certainty or uncertainty of any generator should be modeled the same in each case, causing system burdens and providing system benefits.[75] They argue that PJM's modeling of generation has real consequences for the number and timing of the reliability violations found by the reliability tests.[76]

PJM models generators that have signed a Facilities Study Agreement ("FSA") in its base case in order to allow the generator to contribute to generator deliverability problems.[77] However, PJM does not model the capacity that such generators provide until the generator signs an ISA. Of generation that is proposed in the PJM queue, 72% drop out before the execution of an FSA. Additionally, 5 percent of proposed generators drop out after executing a FSA. Another 4% of generators drop out after executing an ISA.

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72 Environmental Intervenors Initial Brief at 20.
73 Environmental Intervenors Initial Brief at 21.
74 Environmental Intervenors Initial Brief at 21.
75 Id.
76 Environmental Intervenors Reply Brief at 10.
77 PSE&G Reply Brief at 13.

PSE&G argues that prudent transmission planning requires that a generator's contribution to increased loading on transmission facilities must be considered when it executes an FSA, even though the same generator cannot be viewed as part of a planning solution until it executes an ISA or clears an RPM auction.[78]

PJM's modeling of generation in the RTEP does not violate NERC standards as alleged by the intervenors. The NERC Standard TPL-002 requires only that valid assessments of transmission systems consider both existing and planned facilities. It does not address the staging of that consideration any more specifically. PJM considers planned generation as contributing to the generator deliverability problem after it executes a FSA, and considers planned generation for capacity purposes after it executes an ISA. Thus, it certainly meets the NERC Standard TPL-002 because it is considering existing and planned facilities. Intervenors may disagree with PJM's methodology for considering planned generation, but that disagreement alone does mean that it violates the NERC standards. The Board HEREBY FINDS PJM's approach to the modeling of the planned generation does not violate the NERC Standard TPL-002 and is reasonable under the circumstances.

11. Merchant Transmission

Stop the Lines argues that the Project is designed to serve points eastward, and not for reliability. STL points to 1,670MW of firm transmission withdrawal rights from PJM to New York that have been, or will be, established through Neptune Regional Transmission System ("Neptune"), East Coast Power ("ECP") and the Hudson Transmission Partners ("HTP") Project.[79]

Similarly, Rate Counsel refers to the 2007 RTEP, which states that more than 2,800MW of planned merchant transmission exports from eastern PJM to New York City and Long Island compounds the stress on the transmission system. Rate Counsel argues the proposed HTP project could cause almost two dozen transmission overloads in PJM. It points out that PSE&G will be able to make a future decision about whether or not to withdraw the Bergen 2 generating unit from PJM and that the Board should carefully examine whether the Project is really necessary or if it is serving the economic demands of PSE&G's unregulated affiliate.[80]

The FERC permits, and the PJM tariff and operating agreement enables, transmission projects between RTOs to be developed on a merchant basis. These projects are market based. Merchant transmission projects are required to pay interconnection costs to maintain the reliability of the transmission system before they become operational. They are also required to pay future RTEP costs once they are in service.

12. General Policy Concerns

78 PSE&G Reply Brief at 13.
79 Stop the Lines Initial Brief at 9.
80 Rate Counsel Initial Brief at 10.

a. Project Mountaineer

The intervenors have argued the Project is related to Project Mountaineer and that it is designed to bring coal to the east.[81] Testimony presented in this proceeding indicated that Project Mountaineer was an effort by PJM to identify new transmission facilities needed to move power from west to east across PJM, take into account costs and benefits, take into account regulatory, environmental, and siting issues, and provide feedback to a PJM stakeholder group known as the "Regional Planning Process Working Group."[82]

The intervenors contend that the Project is contrary to federal and state energy initiatives and policies, as well as the public interest.[83] Taking it one step further, they believe the the Project is actually the northeast segment of Project Mountaineer, which refers to a PJM plan to expand the market for low-cost coal resources.[84] The Municipal Intervenors point out that PJM's total installed capacity constitutes 40.7% coal, and that the Delaware River has been identified as one of three physical constraints limiting the amount of coal that can flow from west to east.[85]

The Environmental Intervenors believe the Project will provide economic benefits as demonstrated by PJM's extensive market efficiency analysis.[86] The Environmental Intervenors argue the vagueness in the RTEP process result in incorrect price signals that drive increased generation in the western part of PJM and generation retirements in the eastern part of PJM.[87]

PJM, on the other hand, testified that Project Mountaineer was an unrelated FERC initiative that was never advanced beyond one working group meeting resulting from a FERC technical conference held over four years ago.[88] PSE&G argues that there is no relationship between Project Mountaineer and the Project.[89]

For the reasons that follow, the Board HEREBY FINDS that the Project is not designed for coal or as part of Project Mountaineer. First, the Board agrees with PSE&G that Project Mountaineer is not part of an agenda by either the FERC or PJM and was never advanced beyond a concept that was announced during a 2005 FERC technical conference. No intervenor has submitted any evidence to the contrary. Second, the Project has been demonstrated to be needed for reliability purposes, and not to import coal fired electricity. Maintaining reliability on the bulk transmission system is necessary for the Board to ensure that PSE&G can maintain safe, reliable, and adequate service in New Jersey; thus, the Board also HEREBY FINDS that the Project is not contrary to federal and state energy initiatives and policies or the public interest.

b. Energy Master Plan and Leakage

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81 See Generally, Stop the Lines Initial Brief at 31-38; Stop the Lines Reply Brief at 3-5.

82 See CRA International, "Congestion Analysis of the Eastern Interconnection: Simulation Results," prepared for United States Department of Energy, July 20, 2006, http://nietc.anl.gov/documents/docs/DOE_Congestion_Study_2006_Eastern_Interconnection_Analysis.pdf, pp. 79-81. Witnesses on behalf of PSE&G testified that the PJM Project Mountaineer initiative was never advanced beyond one working group meeting in 2005.

83 See Generally, Municipal Intervenors Initial Brief at 64-70.

84 Stop the Lines Initial Brief at 32; Environmental Intervenors Initial Brief at 76-78.

85 Municipal Intervenors Initial Brief at 64-65.

86 Environmental Intervenors Initial Brief at 78-79.

87 Environmental Intervenors Initial Brief at 81.

88 4T:838-25 to 839-6.

89 PSE&G Reply Brief at 20.

The Intervenors contend that the Project is contrary to the EMP. They cite many of the goals and excerpts from the EMP to support their argument that the Project will import electricity from coal producing regions, that it undermines the State's effort to cut greenhouse gas emissions, and sets New Jersey on a path diametrically opposed to the EMP.[90] They also argue that PSE&G admits that the Project will increase leakage.[91]

Rate Counsel also argues that the Project does not include any of the future energy efficiency and demand response resources that will result from implementation of the EMP.[92] More broadly, the Environmental Intervenors argue that New Jersey and Pennsylvania state initiatives should have been considered.[93] They also stress that the EMP plans for reduced peak load in 2012 in the range of tens to hundreds of MW, while PA Act 129 will result in 1,193MW of peak load reductions in 2012.[94] Some intervenors argue that PJM and PSE&G have completely ignored these goals in their analyses.[95]

PSE&G argues that, to the contrary, the EMP clearly acknowledges that demand response and energy efficiency cannot replace traditional generation resources and utility infrastructure, including, in particular, new transmission lines.[96] PSE&G argues the EMP goals are for 2020 and that this Project is needed by 2012, and also that PJM cannot assume that well-intentioned but aggressive goals such as those set forth in the EMP will materialize in the absence of firm commitments.[97] The Company also stresses that neither PJM nor PSE&G have the authority to require generation, demand response, and energy efficiency resources be made available at particular times and/or locations.[98] It also argues that uncommitted demand response cannot be relied upon because transmission planning cannot rely upon the voluntary actions of individual customers.[99]

To begin with, it is important to note that it is not inconsistent to support the goals of the EMP, while at the same time supporting the construction of transmission to address NERC reliability standards. The goals of the EMP are aggressive and designed to produce various benefits, including economic, environmental, and reliability benefits. Transmission planning in this case, however, is focused solely on assuring reliable service to customers. Regardless, while the Board continues to actively pursue ways to meet the EMP's goals, those goals are for 2020 and this Project is needed by 2012. Furthermore, it is unknown whether the goals of the EMP will be met, especially without firm commitments in place to meet those goals. Thus, the Board HEREBY FINDS that under such circumstances, it is not unreasonable for PJM to omit the goals of the EMP or of PA Act 129 in its RTEP, and that the Project is not contrary to the goals of the EMP.

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90 Municipal Intervenors Initial Brief at 66; Stop the Lines Initial Brief at 34.

91 Leakage refers to "an increase in greenhouse gas emissions related to electric generation sources located outside of the State that are not subject to a state, interstate, or regional greenhouse gas emissions cap or standard that applies to generation sources located within the State." N.J.S.A. 48:3-87(i).

92 Rate Counsel Initial Brief at 7.

93 Environmental Intervenors Initial Brief at 38-44.

94 Environmental Intervenors Initial Brief at 40-41.

95 Environmental Intervenors Initial Brief at 42.

96 PSE&G Initial Brief at 47.

97 PSE&G Initial Brief at 47.

98 PSE&G Reply Brief at 11.

99 PSE&G Reply Brief at 11.

While the Board is satisfied here that PJM's analysis was reasonable and sufficiently showed the necessity of the Project, the Board and its Staff should continue to advocate for PJM to place greater emphasis on measurable state and federal energy efficiency and demand response policies and programs that may not have cleared the RPM Auction.

With respect to leakage, N.J.S.A. 48:3-87(c)(2) directs the Board to adopt regulations establishing a regulatory mechanism to mitigate "leakage."

A regional greenhouse gas emissions cap applies to fossil-fueled electric power generators with a nameplate capacity of at least 25 megawatts, located within a ten-state region that includes New Jersey. Specifically, the Regional Greenhouse Gas Initiative ("RGGI") caps carbon dioxide (CO_2) emissions from these generation sources in a ten-state region includes the entire territory served by the NYISO, the entire territory served by ISO New England Inc. ("ISO-NE"), and three states served by PJM – New Jersey, Delaware, and Maryland.

Although the Board has not yet adopted those regulations, it has issued an Order stating the actions that it is taking to mitigate leakage. In the Matter of a Greenhouse Gas Emissions Portfolio Standard and Other Regulatory Mechanisms to Mitigate Leakage, Docket No. EO08030150, May 4, 2009 (the "Leakage Order"). Among other things, the Board directed that in any proceeding under N.J.S.A. 40:55D-19 in which the development proposed by a public utility is an electric transmission facility, Board Staff must seek information from the parties to enable the Board to evaluate the effect of the development upon greenhouse gas emissions inside New Jersey as well as emissions associated with imported electricity. The Board specified that its direction would take effect immediately.

This direction reflects a concern, expressed by members of the public and by parties in this proceeding, that expansions of transmission infrastructure increasing New Jersey's ability to import electricity could promote increased development and utilization of coal-based electricity west of the Delaware River. STL and Environmental Intervenors cited "Project Mountaineer" in connection with this concern.

In carrying out the Board's direction concerning leakage, Board Staff sought information in discovery about the potential effect of the Project on greenhouse gas emissions associated with leakage. In response to discovery questions from Board Staff, on November 13, 2009, PSE&G provided an analysis to assess the potential impact of the Project on the dispatch, and resulting change in CO_2 emissions, from (i) electric generating units in New Jersey, Delaware, and Maryland, and (ii) units in the rest of the territory served by PJM. The analysis used production cost modeling software known as "PROMOD," with a detailed security-constrained unit commitment and dispatch module. PROMOD simulations were performed using three peak load projections: PJM's 2013 projection of peak load; a five percent reduction from that projection; and a five percent increase from that projection. The three scenarios were modeled with and without the Project in service. An additional scenario assumed that RGGI would be replaced by a national CO_2 cap in 2013.

The worst case of these scenarios projected an increase of less than 0.04% in overall CO_2 emissions from electric generation within PJM. No information submitted by any of the other parties contradicted this conclusion. Nor was there any significant cross-examination on this issue in evidentiary hearings. Therefore, the Board HEREBY FINDS that the results of the leakage analysis show that this project will not significantly increase overall CO_2 emissions from electric generation in PJM.

13. Severity of Violations

The intervenors contend PSE&G has not shown that the Project is needed and that the violations projected are overstated. For example, as a result of changing conditions, Stop the Lines argues that, of the 23 original potential reliability violations that PSE&G asserted as the basis for the need for the Project, ten of them have been pushed out beyond the 15-year planning horizon in the March 2009 RTEP.[100] It further argues that many of these violations are nominal in nature, at less than a 5% overload condition.[101] Stop the Lines argues, therefore, that it may be more cost effective and less environmentally intrusive to consider individual solutions to the projected violations and that, in any event, the various RTEPs show a pattern of fewer and less severe criteria violations as time passes and the need for the line that may have now evaporated.[102]

Similarly, the Environmental Intervenors have alleged the March 2009 Retool demonstrates that PSE&G has overstated the severity of the violations, because the initial peak load forecasts and estimates of future demand growth relied on by PSE&G were quickly outdated by the economic recession beginning in the final quarter of 2008.[103] They contend the January 2009 peak load forecast shows much lower peak demand than the January 2008 peak load forecast resulting in significant changes; most notably that only 13 of the 23 original reliability violations remain. Additionally, many of the violations that remain have been pushed out several years.[104] In sum, the Environmental Intervenors believe that many factors continue to change, and that an up to date retool might further reduce the number of projected reliability violations.[105] If so, it believes that a targeted look at the near term reliability violations might be solved through other transmission solutions, but that PJM and PSE&G never examined this because of their conclusion that too many facilities would need to be upgraded.[106]

PSE&G states that the updated RTEP studies and the resulting evolution of the identified violations serves to demonstrate the robustness of the RTEP process and the severity of the reliability concerns driving the need for the Project.[107] The fact that the subsequent RTEP studies shows changed and/or reduced violations does not change the finding that there are still violations projected to occur beginning in 2012.

It is difficult to see how a reduction in violations from one RTEP to the next leads to the conclusion that the existing violations still projected to occur are overstated. The violations that remain are NERC transmission planning criteria violations and must be resolved. PSE&G and PJM have shown that the Project is a reasonable solution to resolve all of the projected NERC transmission planning criteria violations and submitted testimony that smaller “band-aid” solutions will not provide a robust enough solution. The Board also notes that some of the violations that remain still represent relatively large overloads, such as the 8 percent overload of the Kittatinny-Newton 230 kV line in 2012 discussed above in Section VI(A)(5) above. The also Board reiterates that, while it believes the Company has proven that the Project is necessary under N.J.S.A. 40:55D-19, the Project must only be found to be reasonably, not indispensably

100 Stop the Lines Initial Brief at 12.
101 Stop the Lines Initial Brief at 12.
102 Stop the Lines Initial Brief at 13.
103 Environmental Intervenors Initial Brief at 24.
104 Environmental Intervenors Initial Brief at 26.
105 Environmental Intervenors Initial Brief at 28.
106 Environmental Intervenors Initial Brief at 28-31.
107 PSE&G Reply Brief at 16.

necessary, for the service, convenience or welfare of the public.[108] Certainly PSE&G has met its burden.

Therefore, Board FINDS that PSE&G has met its burden of proof and has shown that the Project is reasonably necessary for the service, convenience and welfare of the public. While the assumptions and forecasts underlying the analyses supporting the need for the line are conservative, the Board FINDS that the results are not unreasonable and meet the criteria for showing the need for the line.

B. Engineering and Construction

1. Project Modifications

Stop the Lines argues that the Board cannot approve the Project because information is missing and was presented at the last minute without sufficient notice. Stop the Lines contends that full drawings of the proposed project were not provided until the first day of the hearings, with no time for discovery or review.

Similarly, the Municipal Intervenors argue that the Project has changed significantly since January 2009, but that PSE&G never amended its Petition as required by the Board's regulations at N.J.A.C. 14:1-4.7, and that if the Board approves the Project it will violate the due process rights of all the parties involved. They also argue that the Project is not ripe for review and that it was still in the preliminary stages of development during the evidentiary hearings. As a result, the affected municipalities do not know how, or even precisely where, the Project will be constructed. Municipal Intervenors believe that PSE&G's project documents would not pass muster under a site plan review process.

PSE&G argues the changes made do not change the fundamental nature of the Project and they are aimed at addressing public concerns and are in the public interest. PSE&G argues that requiring a utility to amend its application every time it seeks to make a refinement to a project in response to public concerns would have a chilling effect on the utility's willingness to address public concerns.

Despite the continuing changes to the Project, the fundamental nature of the Project has not been altered since the Petition was filed. It is unreasonable and impractical to expect PSE&G to have every detail of a $1.2 billion transmission line and associated switching stations finalized prior to filing their Petition with the Board. It is clear that PSE&G has made changes to the Project, where appropriate, to address public concerns and the concerns of interested parties. Therefore, the Board HEREBY DETERMINES that the modifications made throughout this process were reasonable and in the public interest. They are also consistent with the Board's past practice.[109]

Furthermore, the parties' due process rights were not violated. PSE&G stated in its Petition that the location of the transmission line would be within the existing ROW. This has not changed. All of the municipalities were on notice, and many of them were parties to this proceeding. Furthermore, as discussed below, the changes in the switching station locations were made by

[108] See In re Public Service Electric & Gas Co., 35 N.J. 368 (1961).
[109] In Re Public Service Electric & Gas Co., 100 N.J. Super. 1 (1968).

PSE&G in response to concerns of interested parties and the public. The municipalities affected by the switching station modifications received notice and did not object.[110]

The Board also notes that, with respect to any modifications that were identified shortly before the evidentiary hearings, Commissioner Fiordaliso specifically reserved hearing on for the following week to allow the parties sufficient time to review.[111] Additionally, where appropriate, Commissioner Fiordaliso made, and allowed, transcript requests for additional documentation which was provided by PSE&G.

2. Conductor Modification

Stop the Lines argues that the conductor configuration change from four conductors to three conductors for the 500kV circuit was disclosed on the second day of hearings, which causes electrical changes, cost impacts, and EMF modeling impacts. It also contends that the tri-conductor configuration will increase noise levels and that the record has no information about what these new noise levels will be.

In response, PSE&G argues that the conductor change was driven by the manufacturing capabilities for monopoles, which, based on public input, were the preferred tower structure. PSE&G stated that it will still meet all New Jersey regulations with a tri-conductor configuration for the 500kV circuit and that the conductor change will not impact the electrical parameters of the Project.

The Board is persuaded that the conductor configuration change was made based on an effort to address the concerns of the public and municipalities. This much was noted at the hearing.[112] The conductor change has no negative impact on the Project, except that it may increase audible noise. However, contrary to Stop the Lines statement that the record has no information regarding the noise levels of the new conductors, PSE&G has testified that the audible noise requirements of New Jersey will still be met.[113] Additionally, the conductor change will actually reduce the electric fields associated with the Project.[114] Therefore, the Board HEREBY FINDS that the conductor modification requested by PSE&G is reasonable and should be implemented. The Board also HEREBY FINDS, however, that PSE&G must maintain noise levels within the audible noise requirements of N.J.A.C. 7:29-1 et seq.

3. Switching Station Locations

Stop the Lines argues that the relocation of the Jefferson switching station to Hopatcong is a major alteration in the Project and that the Board should insist on a full disclosure and review of the terms of the agreement between PSE&G and the Highlands Council, electrical impacts, and changes in cost. It claims that the relocation of the East Hanover switching station to Roseland is a last minute major altercation and that the record is not developed fully enough for the Board to make a decision on this switching station change. The Municipal Intervenors share the same

[110] In fact, the Board received written notification from the Borough of Hopatcong indicating its support for the new switching station on January 20, 2010 and from Borough of Roseland indicating it had notice of the relocation on February 9, 2010.
[111] 1T:8:1-25.
[112] 2T:309:5-14, 318:15-23, 322:9-18.
[113] 1T 318:15-23, 320:14-17.
[114] 5T1002:16-22.

concern, and also raise concerns with respect to the revisions to access road and tower locations.

On August 21, 2009, PSE&G proposed moving the Jefferson switching station to Hopatcong after receiving input from the Highlands Council, the NJDEP, and the public.[115] PSE&G also proposed moving the East Hanover switching station to the Borough of Roseland after receiving input from East Hanover and the public.[116] PSE&G maintains that the Hopatcong and Roseland proposals are only alternatives and that PSE&G is still ready, willing and able to construct the stations in Jefferson Township and East Hanover.

The Board is persuaded by the Company's efforts to minimize the impacts associated with its switching station. The Hopatcong switching station will have less of an environmental impact than the original location and will require less towers to be constructed. It will also have a smaller footprint than originally proposed and is the more appropriate location for this Project.[117] Additionally, Hopatcong has indicated that it is not opposed to this move. PSE&G has proven that locating the switching station in Hopatcong is in the public interest. The Board, therefore, HEREBY FINDS that the switching station originally proposed in Jefferson should be located in Hopatcong and DIRECTS the Company to construct the switching station in Hopatcong.

The Roseland switching station would be constructed near an existing substation in Roseland and would be further from existing residences.[118] It will also not disputed by any of the intervenors that it will impact less wetlands and critical natural resources.[119] Additionally, the Township of East Hanover strongly supports the change in location and actively opposed the location of the switching station within its borders. For these reasons, this switching station location is more appropriate for the Project. The Board, therefore, HEREBY FINDS that the switching station originally proposed in East Hanover should be constructed in Roseland and HEREBY DIRECTS PSE&G to construct the switching station in Roseland.

4. Fiber Optics

Stop the Lines argues that revenue from fiber optic has not been disclosed. During cross examination, however, PSE&G witness Richard Franklin testified that fiber optic was being used for transmission line control and operation and in no instance for telecommunications.[120] Therefore, the Board is not persuaded by Stop the Lines assertions, and does not believe that there are any serious issues raised with respect to fiber optics. The Board HEREBY FINDS that the intervenors arguments with respect to fiber optics are without merit.

5. Reactive Power

Environmental Intervenors and Stop the Lines argue that the Project will have a negative impact on reactive power because large transmission lines create greater line losses and reactive power issues that can result in increased blackouts and brownouts.

[115] MI-4 and August 21, 2009 letter to the Board from PSE&G.
[116] 5T1187:14-20.
[117] Exhibit MI-2.
[118] Exhibit S-23, Response to S-ENR-54 and Alternative S-ENR-54.
[119] 5T1241:17-25.
[120] 1T 60:8-25, 61:1-3.

PSE&G, on the other hand, argues that the Project will reduce the need for reactive power and will add 250 MVARs of charging to the transmission system that will increase reactive power and contribute to voltage stability. PSE&G argues that, like other 500 kV projects, this Project is viewed as a solution to reactive power issues that may exist.

The intervenors arguments with respect to reactive power are without merit. The Project will reduce the flow of electricity on other circuits, thereby reducing line losses. The reduced line losses and additional charging provided by the Project will increase voltage on the entire system and provide the system with higher reactive power output from existing static sources. Thus, the Board HEREBY FINDS that the Project will not cause or add to any reactive power problems in the region.

C. Routing

1. Route Selection

PSE&G engaged the Louis Berger Group to perform a routing and siting analysis of the Project. In its ARI, three alternative routes were carried forward for evaluation.[121] It analyzed potential impacts on each of the routes by studying the geology and soils, surface water resources and aquatic species/habitat, wetlands, vegetation, wildlife and sensitive species, land use, recreation lands and designated natural scenic resources, cultural resources, and aesthetics. After thorough review, the ARI determined the preferred route to be Route B, the route along the existing PSE&G ROW, as proposed in the Petition. This selection was based on the following factors:

- Route B would be constructed entirely within an existing transmission line ROW for its entire length in New Jersey, which would minimize impacts to the natural and human environment. No construction on virgin ROW would be required, which represents a substantial advantage over Route A, where over 24 miles of new ROW would be needed.

- No substantive additional clearing would be required, which represents a substantial advantage over Route C, where vegetation clearing would be needed along 19 miles of ROW if the new line would be constructed parallel to an existing line.

- Route B has the least amount of wooded wetland crossed (0.1 mile), compared to Route A (2.4 miles) and Alternative C (1.3 miles). Thus, Route B would have the least potential to permanently alter this type of wetland habitat.

- The aesthetic impacts associated with Route B are substantially less than the virgin ROW portion of Route A. Incremental aesthetic impacts associated with Route B are slightly less compared to Route C because of the need to clear vegetation along the 19 mile portion that would parallel the existing 230-kV transmission line. Removal of forest in this area would reduce screening, and the wider cleared ROW would be more visually intrusive.

- Route B crosses the least amount of forested land (0.3 miles), compared to Route A (18.5 miles) and Route C (11.4 miles). This would result in substantially less potential for

[121] Exhibit P-8 (Direct Testimony of Jack Halpern).

soil erosion and permanent alteration of forest habitat, and no incremental increase in forest fragmentation.

- Route B impacts the least amount of Highlands Preservation Area (9 miles)

- Route B is likely to have the least incremental impact on historical and archaeological resources compared to the other two routes because the existing ROW would not need to be expanded in most instances.

The intervenors argue that Route B was preordained and that the alternatives reviewed in the ARI had substantial engineering and construction challenges and were, therefore, never seriously conferred viable alternatives. They also argue that PSE&G should have explored additional alternatives and that, given the size of the Project, a safe and proper ROW should be 200 feet. They also note that PSE&G has not received the required approvals from the National Park Service yet. The Montville BOE argues more specifically that the three towers located near the Lazar Middle School should be relocated because of health concerns. Rate Counsel and Stop the Lines also argue that certain towers should be relocated, though no specific towers are identified.

PSE&G explored, through the Louis Berger Group, three potential routes for the Project. None of the intervenors submitted testimony with regard to the routing of this Project. It is uncontroverted that the Louis Berger Group used existing aerial photography, field inspections, public meetings, and computer data sources to identify these three routes. Then, each route was analyzed to identify potential impacts to geology and soils, aesthetics, wildlife and sensitive species, wetlands, recreation lands and natural scenic resources, and cultural resources. Thus, the Board FINDS that the ARI produced provides competent and relevant evidence of PSE&G's review of three alternate routes. Of these three, the evidence is clear that Route B is the most appropriate, primarily because PSE&G has shown that its existence along the current PSE&G ROW minimizes potential impacts to the environment and the community. The Board FINDS that there is no reasonable practicable alternative which would have less adverse impact upon the environment or upon the land use and zoning ordinances of the respective counties and municipalities. The testimony presented indicated that Route B would not require construction of the Project in a virgin ROW or substantial clearing, as opposed to Route A or C. It has the least amount of wooded wetland and forested land, and impacts the least amount of Highlands Preservation Area, among other things.

Though the intervenors argue that the route was preordained, the fact that the route along the ROW would reduce new impacts to both the environment and community is indisputable. Additionally, during the hearing, the Municipal Intervenor's questioned the PSE&G witness from the Louis Berger Group, Jack Halpern, as to whether PSE&G had indicated at any time during the development of the ARI that they were predisposed to a particular route, such that they may have "leaned more favorably toward Route B as the recommended route."[122] He responded that, while the Company had indicated a strong interest in Route B, he absolutely did not lean more favorably on that route as the recommended route.[123] With the principle that the Board is to consider the community zoning plans of affected communities, as well as the public interest, it is clear that locating the transmission lines almost entirely within the ROW is the most reasonable route. The effects to the community of constructing the Project in a virgin ROW would be far more significant.

[122] 1T187:12-23.
[123] Ibid.

Furthermore, PSE&G clearly considered alternative routes, as evidenced by the ARI and the testimony presented by PSE&G witnesses. The burden of demonstrating a reasonable alternative beyond this ought to be on the intervenors, yet they submitted no reasonable alternative.[124] Thus, the Board HEREBY FINDS that PSE&G has met its burden of proving that its proposed routing is reasonable, and that no alternative route would be less intrusive to the environment or community. To be clear, the Municipal Intervenors did introduce, during the evidentiary hearing, a marked map indicating an alternative route around the Township of East Hanover.[125] As was testified to at the hearing, however, that proposed route around East Hanover is impractical, because of environmental and historic preservation constraints. There was also testimony that this alternative would require that transmission lines be placed along interstate highway property, which is not permitted by the NJDOT, except in cases of extreme need where there are no alternatives.[126] Therefore, the Board HEREBY FINDS that this minor route change is not practical.

Additionally, Stop the Lines and Rate Counsel requested that the Board require PSE&G to relocate towers based on EMF concerns and/or tower fall zone concerns. However, neither intervenor identified any particular towers or even any particular location along the route where they suggest that towers be relocated. Given the lack of detail in alternative locations presented, there is no possible way the Board could require PSE&G to relocate towers based on these concerns. Nonetheless, the Board HEREBY DETERMINES that it is in the public interest to allow the parties to negotiate specific tower relocations. To this end, the Board HEREBY DIRECTS PSE&G to work in good faith with the other parties to determine additional relocations or realignments of towers, and type of tower structure, that are practicable and in the public interest. PSE&G shall report to the Board all proposed relocations and realignments within 90 days of the date of this Board Order. If the parties are unable to reach a reasonable agreement, PSE&G may proceed with the tower locations as proposed and modified in this Board Order.

Finally, the Montville BOE argues that the location of three specifically identified transmission towers (78/3, 78/4, and 78/5) are too close to the Lazar Middle School, and has identified a location in which these three specific towers can be relocated or realigned. The Board FINDS with the Montville BOE that moving these three specific towers is prudent and reasonable. Therefore, the Board HEREBY ORDERS PSE&G to provide a report to the Board within 90 days of the date of this Board Order identifying a relocation or realignment of these three towers. The towers can be relocated to the suggested Montville BOE alternative, or to another feasible alternative location. If the Company believes that such relocation or realignment is highly impractical or not possible, it shall report to the Board, in detail, the reasons for that conclusion and the Board will take appropriate action.

2. Property Related Issues

The intervenors claim that the Project will result in decreased property values, and that the PSE&G witness who testified about property values was not a licensed or certified appraiser. They also claim that PSE&G did not provide a study or appraisal to evaluate the Project's impact on property values. In response, PSE&G has consistently argued that property values will not be affected by the Project because the existing transmission lines predate virtually all of the homes along the Project route.

[124] See In Re Application of Hackensack Water Co., 41 N.J. Super. 408, 426-427 (App. Div. 1956).
[125] Exhibit MI-4.
[126] 1T289-290.

The intervenors failed to identify with any specificity the properties allegedly affected, and they also failed to submit any evidence about potential property value decreases. Aside from this general assertion about lost property values, the record lacks any evidence to contradict PSE&G's testimony that the Project will not adversely impact property values. PSE&G's argument is based primarily on the fact that the selected route for the Project follows an existing ROW, where the transmission lines predate the construction of almost every home along the Project route.

Although the intervenors have suggested otherwise, PSE&G does not have an obligation under N.J.S.A. 40:55D-19 to conduct a survey or appraisal for the Project. To be clear, however, the Board HEREBY FINDS that PSE&G does have an on-going responsibility of compensating property owners for any: 1) physical property damage, and 2) necessary acquisition of property, or other interest therein, that it requires as a result of this Project pursuant to N.J.S.A. 48:3-17.6. To these ends, PSE&G has indicated that it is in the process of acquiring additional property rights along certain portions of the Project route, and submitted testimony on the valuation of those acquisitions. If PSE&G knows, or should know, that the Project will have a substantial adverse effect on certain property values, the Company must take appropriate action to address those valuation concerns.

The intervenors also raise the issue of whether unidentified property owners can obtain an FHA mortgage if their home may now fall within the engineered "fall distance" of a tower, as defined in HUD 4150. There is conflicting evidence in the record with respect to this issue. HUD 4150 states, in pertinent part, that no dwelling or property improvement may be located within the engineered fall distance of any pole, tower, or support structure of a high-voltage transmission line, and that the appraiser may use tower height as the measurement of the fall distance. Thus, say the intervenors, there are many property owners that will be incapable of obtaining FHA mortgages, especially since the tower height in most instances will be nearly doubled as a result of the Project.

According to certain HUD regulations cited by PSE&G, however, restrictions on obtaining an FHA mortgage apply only if a dwelling or related property improvement is located within the utility easement.[127] Those regulations state that, if a dwelling or related property improvement is located within the transmission line easement, the underwriter must obtain a letter from the owner or operator of the tower indicating that the dwelling and its related property improvements are not located within the tower's (engineered) fall distance. Otherwise, the FHA financing cannot occur. PSE&G claims that, in any event, lattice towers do not topple; therefore, the fall distance is minimal. Specifically, in a sample letter drafted to property owners, PSE&G stated that transmission towers, which could fail as a result of excessive loading, would not totally collapse. Instead, according to PSE&G, tower members would deform and/or buckle, but the structure would essentially remain at its position and not topple as a rigid body.[128]

Even assuming PSE&G's contention that lattice towers do not topple is correct, it does not fully dispose of the fall zone issue because PSE&G has indicated its intention to use monopole towers in some locations. Specifically, PSE&G has indicated its intent to use monopole structures in more populated areas because of public input.

[127] Exhibit P-25.
[128] Exhibit P-24.

Regardless of the conflicting testimony and the overall lack of clarity in the record regarding the ability for certain property owners to get an FHA mortgage, as noted above, it is the Company's on-going responsibility to explore these issues as the Project moves forward. If PSE&G knows, or should know, that the Project will have a substantial adverse effect on certain property values, the Company must take appropriate action to address those valuation concerns in accordance with N.J.S.A. 48:3-17.7 and N.J.A.C. 14:1-5.8.[129]

3. Environmental Concerns

The Environmental Intervenors assert that PSE&G has not completed required environmental studies identifying natural resources and environmental impacts, nor has the Company submitted mitigation plans. According to the Environmental Intervenors, without a determination of these environmental impacts, it is impossible for the Board to ascertain whether the Project is reasonably necessary for the convenience, safety, and welfare of the public. Intervenors stress that the Project is routed through many environmentally sensitive areas that are irreplaceable, including Delaware Water Gap, the Appalachian Trail and the Highlands Preservation Area. Furthermore, the exact location of access roads was not included in the ARI making it impossible to know how many priority sites, natural areas, open space lands, well-head protection areas, core forested areas, critical wildlife habitat, groundwater recharge areas, or other sensitive areas, are being impacted. Lastly, in the event that the Board decides to approve the Project, the Environmental Intervenors recommend imposing the condition on PSE&G not to begin construction until it receives all necessary federal and state environmental approvals.

PSE&G claims to have taken prudent steps in order to minimize the environmental impacts of the Project and will perform mitigation plans in accordance with all applicable laws and regulations, including an avian protection plan currently under development. In particular, PSE&G argues that the proposed route was chosen to minimize environmental impacts as the replacement of towers is proposed to take place within the existing ROW. Furthermore, the Company contends that participation of numerous federal and state agencies involved with the Project, underscores the fact that the environment will be fully and substantially protected during the construction of the Project. On the issue of routing changes as result of a possible denial of environmental permits, PSE&G asserts that the analysis under N.J.S.A. 40:55D-19 does not require the Board to approve the location of every tower or access road. Instead, the Board must simply determine that the Project as a whole is reasonably necessary.

The Board is persuaded that PSE&G has taken steps throughout this process to minimize environmental impacts. Constructing the Project within the existing ROW clearly minimizes a substantial amount of environmental impacts because the Company will not have to interrupt virgin ROW. PSE&G has indicated it is developing an avian protection plan, and the Board HEREBY DETERMINES that this plan is warranted and necessary for a project of this size. Thus, the Board HEREBY ORDERS PSE&G to develop and implement an avian protection plan.

Additionally, the Board HEREBY ORDERS the Company to continue, on an on-going basis, to minimize environmental and community impacts associated with the Project. The Company should to accept public input where possible and optimize the Project where practical. The

[129] In I/M/O Jersey Central Power & Light Company (Oyster Creek Nuclear Generating Station), 166 N.J. Super. 540, 545 (App. Div. 1979), the Court noted that N..J.S.A. 48:3-17.7 "empowers the [Board] to prevent condemnation, not compel it." The Court further ruled that a property owner's action to compel condemnation was not cognizable before the Board.

Board understands that other state and federal agencies have the primary concern of completing a full review of environmental impacts and potential mitigation. This is especially the case with finalizing the locations of access roads. The Board is cognizant that, with a Project of this scope with an estimated two year construction period, and potential reliability violations occurring in 2012, that it would not be prudent for the Board to wait to make a decision until every detail of Project routing and construction were finalized by the Company and the other regulatory agencies. While the Board HEREBY DETERMINES that the Company should be afforded the opportunity on an on-going basis to optimize the tower and access road location, it also HEREBY ORDERS that PSE&G should not be afforded the opportunity to modify the route as proposed and modified by the Board in this Order. Therefore, the Board HEREBY ORDERS PSE&G to seek further approval of this Board for any modifications to the Project route as proposed and modified in this Order.

D. EMF

Several intervenors argue that PSE&G has not provided sufficient evidence to establish that the Project's EMF levels are safe and, therefore, the Board should deny the Petition. PSE&G replies that there is clear and convincing evidence in the record supporting that EMF does not pose a risk to public health. Furthermore, PSE&G asserts that it is uncontested that EMF levels associated with the Project are in the range of levels expected around every-day appliances such as hair dryers, air conditioners, vacuum cleaners, etc. Therefore, according to PSE&G, EMF should not prevent the Board from approving the Project.

Dr. Bailey testified that over the past 30 years many scientific studies have been conducted to determine whether electric or magnetic fields affect biological systems and health. The results of those studies have failed to either confirm or deny the existence of a causal link between EMF and adverse impacts on human health. Additionally, the record in this proceeding has clearly established that nearly all of New Jersey's population is exposed to EMF originating from existing power lines, household wiring and appliances. According to Dr. Bailey, though EMF can be harmful at extremely high levels, they are not harmful at the levels humans are exposed to under transmission lines.

There are no federal standards for electric fields. New Jersey has adopted a standard of 3kV/m for electric fields at the edge of a ROW. The maximum level of electric fields at the edge of the ROW for the Project is projected to be 1.6 kV/m. There are no standards in New Jersey, however, for electric fields within the ROW. Thus, the Board reviewed the standards of several other states presented in the record that set maximum levels of permitted electric fields within the ROW. The lowest standard for maximum permitted electric fields is Montana at 7 kV/m. The projected maximum level of electric fields associated with the Project within the ROW is 4.5 kV/m.

Thus, the Board HEREBY DETERMINES that the Project will comply with the New Jersey's standard for electric fields at the edge of the ROW, and is well within the guidelines set by other states for electric fields within the ROW.

There are no federal standards for magnetic fields at power frequencies. Additionally, New Jersey has not adopted standards for magnetic fields. Therefore, the Board reviewed standards adopted by other states and the international community for guidance on commonly accepted levels of magnetic fields for transmission lines. At the state level, only New York and Florida have guidelines for magnetic fields. Those guidelines establish that magnetic fields for new 500 kV transmission lines at the edge of the ROW should not exceed 200 mG. The projected

maximum levels of magnetic fields associated with the Project are 115 mG at the edge of the ROW. Thus, the levels are lower than the standards set in other states. As reflected in the record, Dr. Blank's recommendation to use 3 to 4 mG as standard for magnetic fields has not been endorsed by any state or International Committee. Therefore, the Board HEREBY FINDS that the estimated magnetic field levels are within the guidelines set by other states and the international community.

The intervenors also argue that the amperage levels used by PSE&G in its EMF estimations are misleadingly low and, as a result, the EMF levels from the Project could be three or more times higher than the estimates. They also urge the Board to require PSE&G to confirm that its estimates were correct once the line is fully operational, and to continually monitor EMF levels on a going forward basis.

The methodology used by Mr. King in his calculations is reasonable and was based upon his professional experience as a consultant with respect to EMF issues.[130] However, the Board shares the intervenors concerns that the estimates calculated by Mr. King should be shown to be accurate once the Project is fully operational. While scientific studies have not been able to provide conclusive evidence linking EMF to adverse impacts on human health at the levels expected from this Project, the Board is continuously monitoring ongoing efforts in this area and should material evidence be established that EMF could subject the population of New Jersey to adverse health effects, this Board will take appropriate action. In this spirit, the Board HEREBY DIRECTS PSE&G to conduct a survey of field readings in 2013 similar to that included in the record with the purpose of ensuring that: 1) PSE&G's estimated EMF and noise levels are correct, and 2) that the EMF and noise levels are within the NJ Guidelines, as well as within all other guidelines and standards considered in this Order. The Board HEREBY ORDERS PSE&G to submit with the Board a report describing the results of the survey as soon as practicable after completion of the survey and in no event more than 12 months after the line becomes operational.

Several intervenors argued that in light of the uncertainties surrounding potential deleterious affects of EMF, the principle of "prudent avoidance" requires that this type of project minimize EMF levels by limiting exposures that can be avoided with reasonable investments of money and effort. The Board agrees. The Board HEREBY DETERMINES, however, that the design and routing of the Project, however, incorporates reasonable efforts to manage EMF exposure.

E. Cost allocation

In determining whether the Project is "reasonably necessary for the service, convenience or welfare of the public," the Board must consider the cost that New Jersey electricity customers will bear in connection with the Project. Construing this standard under the predecessor to N.J.S.A. 40:55D-19, the New Jersey Supreme Court stated:

> Alternative sites or methods and their comparative advantages and disadvantages to all interests involved, including cost, must be considered in determining such reasonable necessity.
>
> [In re Public Service Electric & Gas Co., 35 N.J. 358, 377 (1961).]

[130] Peak current of 3000A for the 500 kV line and peak current of 2000A for the 230 kV line. Exhibit KGK-2 at 14.

The estimated cost of the New Jersey portion of the Project is approximately $750 million and the estimated cost of the entire Project is $900 million to $1.2 billion. Schedule 12 of PJM's FERC-approved Open Access Transmission Tariff ("Schedule 12") establishes the portion of the cost that New Jersey electricity customers would bear. Schedule 12 currently uses a "postage stamp" cost allocation methodology for all new transmission that operates at or above 500kV including this Project. Under a postage stamp methodology, costs are allocated on a pro rata basis across all transmission zones within PJM. Under the current tariff, New Jersey customers would bear about 14 percent of the cost. Based upon the estimated cost of the Project, an average residential electric customer's bill could see an increase of approximately $3.60 per year. If costs are not allocated pursuant to Section 12, and in the most extreme case that New Jersey customers were to bear close to 100% of the cost of the Project, the average residential electric customer could see an increase of approximately $25.15 per year. The Board notes that these increases only represent the increase for the transmission component of a customer's bill. The Project will also provide an increased competitive supply of energy and capacity in New Jersey, which likely would reduce energy and capacity prices in New Jersey. Thus, while the pure cost allocation of this Project will increase costs for New Jersey ratepayers, there would also likely be a corresponding decrease in energy and capacity costs to offset the increase.

A recent court decision has called into question whether the approach to cost allocation set forth in Schedule 12 will determine how much of the cost of the Project will be borne by New Jersey electricity customers. In Illinois Commerce Commission v. Fed. Energy Regulatory Comm'n, 576 F.3d 470 (7th Cir. 2009), rehearing and rehearing en banc denied, (October 20, 2009), the Court of Appeals criticized PJM's FERC-approved method of allocating the cost of new transmission projects of 500 kV or more, and remanded the matter back to the FERC. On January 21, 2010, the FERC established a paper hearing on the remand. The paper hearing on remand does not establish a date for action by the FERC.

Thus, the Board recognizes that uncertainty is unavoidable and will remain unavoidable for the foreseeable future. With PJM's assertion that reliability violations are set to begin in New Jersey in 2012, and PSE&G's lengthy construction schedule, the Board must make a decision in this matter without an absolutely certainty with respect to cost allocation to New Jersey ratepayers. Regardless, under the Section 12 cost allocation or the extreme case where New Jersey ratepayers bear almost all of the cost, the line remains necessary to relieve reliability violations.

The Board is cognizant that whether the Project is "reasonably necessary for the service, convenience or welfare of the public" must include consideration of the cost of the Project to New Jersey electricity customers. At the same time, the Board is faced with a decision that is time-sensitive, considering the construction schedule and Petitioner's and PJM's assertion that the Project must be in service by 2012 to forestall reliability violations. Thus, the Board HEREBY FINDS that it should not wait until there is complete certainty about the cost of the Project to New Jersey electricity customers and that, even if the costs are allocated almost entirely to New Jersey, the line remains reasonably necessary for the service, convenience or welfare of the public. The Board, however, HEREBY DIRECTS Board Staff to actively participate in the proceeding at FERC on the cost allocation.

ADDITIONAL FINDINGS/ RECOMMENDATIONS

As a procedural matter, the Board HEREBY ADOPTS, in their entirety, all preliminary Orders previously issued by Commissioner Fiordaliso during the pendency of this matter. Additionally, the Board has reviewed the January 28, 2010 Motion to Dismiss and Stay the Proceeding filed

by the Municipal Intervenors. For the reasons noted above in Section VI(E) regarding cost allocation, the Board HEREBY DENIES intervenor's Motion to Dismiss and Stay the Proceeding.

Further, and after a thorough review of the record in this proceeding, the Board HEREBY FINDS:

1) That the Project is necessary to provide safe, adequate, and reliable electric service in the New Jersey and in the PJM region;

2) That the Project is reasonably necessary for the service, convenience and welfare of the public;

3) That PSE&G considered alternative routes for the Project;

4) That PSE&G considered alternative methods to alleviate the projected reliability criteria violations;

5) That Route B, along PSE&G's existing ROW, is a reasonable route considering the alternatives;

6) That PSE&G has proven that the modification of the Project to include a switching station in the Borough of Hopatcong and in the Borough of Roseland to reflect public input, among other reasons, is reasonable;

7) That PSE&G has indicated that the Boroughs of Hopatcong and Roseland were notified of the potential location of a switching station in the municipalities;

8) That the Board has received no opposition to siting the switching stations in those municipalities;

9) That PSE&G's modification of the circuit configuration from a quad-bundled configuration to a tri-bundled configuration as a result of monopole manufacturer limitations is reasonable;

10) That the Project, including the switching stations, as proposed is to be designed and constructed in accordance with all applicable industry standards in a way that will minimize adverse impacts upon the environment, to the extent practicable;

11) That, based upon the record in this proceeding, the Project should not be adverse to the public health and welfare;

12) That the Project can be constructed, installed, and operated without substantial detriment to the public good and without causing undue economic injury to the neighboring property owners, especially in light of the fact that the overwhelming majority of neighboring homes were built after the construction of the existing transmission lines;

13) That PSE&G has the responsibility to explore the issues raised by the Intervenors with respect to the ability to obtain FHA mortgages and other property evaluation related questions on an on-going basis;

14) That, in light of the reliability issues identified in this proceeding, there is no reasonable, practical, and permanent alternative to the construction and operation of the Project that would have any less adverse impact upon the environment, surrounding community, or local land use ordinances;

15) That PSE&G conducted a good faith, reasonable, and extensive analysis of alternative methods for the Project, but that when faced with the number of violations identified by PJM, a robust solution was required;

16) That, as a result of PSE&G's analyses, there are no alternative routes that are reasonably available to achieve an equivalent public benefit and that would have any less adverse impact upon the environment, surrounding community;

17) That PSE&G has, and will continue to take, necessary steps to ensure that the Company and local fire/safety officials are adequately prepared in the unlikely event of an emergency;

18) That there is no basis to determine that the Project would materially affect leakage;

19) That it would be imprudent for the Board to wait until there is complete certainty about the cost of the Project to New Jersey electricity customers to make its decision;

20) That the Board should proceed presuming the current PJM cost allocation; and

21) That the findings contained within this Order that are a result of the thorough and complete review of the record in this proceeding are limited to the facts and circumstances of this particular Project along this particular route, as proposed and modified by the Board in this proceeding, and shall not be construed as a determination by this Board with regard to any other Project that may now be pending or may be brought in the future, and that such determination will be made by this Board on a case by case basis giving due regard to the evidence presented within each such application.

Therefore, the Board HEREBY DETERMINES, in accordance with N.J.S.A. 40:55D-19, that the proposed Project is reasonably necessary for the service, convenience, and welfare of the public in order to enable PSE&G to continue to provide safe, adequate, and reliable service to its customers; that PSE&G should be able to construct and begin operation of the Project, as proposed and modified by the Board in this Order; and that the Local Land Use and Zoning Ordinances, and any other Ordinance, rule or regulation promulgated under the auspices of the Municipal Land Use Act of the State of New Jersey shall not apply to the construction, installation, and operation of the Project.

Accordingly, the Board HEREBY ORDERS that neither N.J.S.A. 40:55D-1 et seq., nor any other governmental ordinances or regulations, permits or license requirements made under the authority of N.J.S.A. 40:55D-1 et seq. shall apply to the siting, installation, construction, or operation of the Project, as proposed and modified in this Order. The Board, however, is cognizant that the Property is located within areas governed by the National Park Service, the Highlands Preservation Act, the Watershed Property Review Board, and the NJDEP. This Order shall not be construed as a certificate, license, consent, or permit to construct or disturb any land within the jurisdiction of these areas should PSE&G need to obtain any approval or

authorization to proceed from these entities, or any other entity as may be required by law or regulation.

Along these lines, the Board notes that this Order is applicable only to the route as proposed by PSE&G and modified by the Board in this Order. Should PSE&G determine that additional modifications to the Project route are required, as a result of the actions of another agency or for any other reason, it must request further approval from this Board.

The Board further ORDERS that:

1) PSE&G construct the switching station that was originally proposed in the Township of Jefferson in the Borough of Hopatcong;

2) PSE&G construct the switching station that was originally proposed in the Township of East Hanover in the Borough of Roseland;

3) PSE&G construct the Project with a tri-bundled conductor on the 500 kV line and single conductor on the 230 KV line;

4) PSE&G continue to optimize access road and tower locations, as well as the type of tower structure in consultation with the appropriate officials and agencies, to minimize the environmental and community impacts to the greatest extent practicable;

5) PSE&G work on a continuing basis with the appropriate fire and safety officials in the Boroughs of Hopatcong and Roseland and their surrounding communities to ensure that both they and PSE&G have adequate equipment and training in the event of an emergency as a result of the construction or operation of the Project;

6) PSE&G develop and implement an avian protection plan in conjunction with guidance from the United States Fish & Wildlife Service;

7) PSE&G provide a report to this Board within ninety (90) days of the date of this Board Order identifying a relocation or realignment of the proposed new towers that are located on or around the Lazar Middle School in Montville Township to maximize the distances of the towers and transmission lines from the school property. PSE&G should explore the option raised by the Montville BOE, as well as any additional options. If PSE&G believes that relocation or realignment is not possible, they shall report to the Board, in detail, the reasons for that conclusion;

8) PSE&G work in good faith with the other parties to this case to determine additional relocation or realignments, as well as the type of tower structure to be utilized, that are practicable and in the public interest. PSE&G shall report to the Board all proposed relocations and realignments within ninety (90) days of the date of this Board Order. Should the parties not reach a reasonable agreement, PSE&G may proceed with the tower locations and access roads as proposed;

9) PSE&G minimize the visual impact of all structures, to the extent practicable;

10) PSE&G conduct a survey of EMF field readings during peak demand once the Project is fully operational, to ensure that the estimated readings were accurate. PSE&G shall report the findings to the Board as soon as practicable after the Project is operational,

and in no event more than 12 months after the line becomes operational. If the actual readings are substantially greater than the estimated readings testified to in this proceeding, the Board will take appropriate action;

11) PSE&G shall evaluate smart grid technology that would support real-time communications along the entire length of the Project and inform Board Staff of the results of the evaluation;

12) That PSE&G comply the New Jersey audible noise requirements;

13) PSE&G evaluate and explore issues raised in this proceeding with respect to the ability of property owners along the Project route to get an FHA mortgage, as well as other property valuation issues. If necessary, after such review, PSE&G should take appropriate action to resolve such valuation issues, and in the event necessary, the Company shall petition the Board pursuant to its authority pursuant to N.J.S.A. 48:3-17.6 and 48:3-17.7;

14) PSE&G compensate property owners for any and all physical property damage that may result from construction of the Project; and

15) PSE&G report to the Board the findings of PJM's next completed RTEP. If that RTEP deems that this Project may no longer appear to be necessary, or can be delayed significantly, the Board's authority to reopen this matter remains.

DATED: 4/21/10

BOARD OF PUBLIC UTILITIES
BY:

JEANNE M. FOX
COMMISSIONER

JOSEPH L. FIORDALISO
COMMISSIONER

NICHOLAS ASSELTA
COMMISSIONER

ELIZABETH RANDALL
COMMISSIONER

ATTEST:

KRISTI IZZO
SECRETARY

I HEREBY CERTIFY that the within document is a true copy of the original in the files of the 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

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