**STATE OF NEW JERSEY**
**BOARD OF PUBLIC UTILITIES**

| | |
|---|---|
| **IN THE MATTER OF THE PETITION OF PUBLIC SERVICE ELECTRIC AND GAS COMPANY FOR A DETERMINATION PURSUANT TO THE PROVISIONS OF N.J.S.A. 40:55D-19** | |
| **(SUSQUEHANNA-ROSELAND)** | **: BPU DOCKET NO: EM09010035** |

# INITIAL BRIEF FOR PETITIONER, PUBLIC SERVICE ELECTRIC AND GAS COMPANY


Marc B. Lasky
Morgan, Lewis & Bockius LLP
89 Headquarters Plaza North
Suite 1435
Morristown, New Jersey 07960
(973) 993-3133

Tamara L. Linde
Jodi L. Moskowitz
David K. Richter
Alexander C. Stern
PSEG Services Corporation
80 Park Plaza, T5G
Newark, New Jersey 07102
(973) 430-8912

Attorneys for Petitioner,
Public Service Electric and Gas Company


Dated: December 28, 2009

**TABLE OF CONTENTS**

## TABLE OF AUTHORITIES

### Cases



### Statutes



### Other Authorities

## Regulations



## Constitutional Provisions

## I.

## PRELIMINARY STATEMENT

On January 12, 2009, Public Service Electric and Gas Company ("PSE&G" or "Company") filed the petition ("Petition") in this matter pursuant to N.J.S.A. 40:55D-19 requesting that the New Jersey Board of Public Utilities ("Board" or "BPU") determine that the construction of the proposed 500,000 volt ("500 kV") Susquehanna-Roseland transmission system upgrade ("Project"), which is necessary to address 23 projected reliability criteria violations in the region, is reasonably necessary for the service, convenience or welfare of the public and, in furtherance thereof, 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 Municipal Land Use Act of the State of New Jersey shall not apply to the siting, construction or operation of the Project.

PSE&G's evidence covers, in detail, the four primary elements of this case: (1) Need, (2) Routing, (3) Engineering and Design, and (4) Electric and Magnetic Fields ("EMF"). The evidence for each of those four elements is summarized, in turn, in this "Preliminary Statement" and discussed in more detail later in this brief.[1]

PSE&G has submitted the indisputable evidence[2] of its own witnesses and of witnesses from PJM Interconnection, L.L.C. ("PJM"), the independent Regional

---

[1] Citations to the record have been intentionally omitted from this "Preliminary Statement" in order to avoid burdening this brief with duplicative citations. Detailed citations are included in the more detailed discussions later in this brief.

[2] Even though PSE&G's evidence is essentially undisputed, as discussed in this brief, its burden here is to prove its case only by a preponderance of credible evidence. See, e.g., In re Atlantic City Electric Company, 2005 WL 1130022, at 10 (N.J. Bd. Pub. Util., Order dated. Apr. 21, 2005 (Docket No. EE04111374)); I/M/O of the Amended Petition of Atlantic City Electric Company for a Determination Pursuant to the Provisions of N.J.S.A. 40:55D-19 etc., 2004 WL 1888408 (N.J. Bd. Pub. Util., Order dated. June 15, 2004 (Docket No. EE02080521)).

Transmission Organization ("RTO") approved by the Federal Energy Regulatory Commission ("FERC"), which is responsible for ensuring the reliability of the transmission grid in the PJM footprint through its comprehensive Regional Transmission Expansion Planning ("RTEP") process, demonstrating the need for the Project. The salient points of this evidence are set forth below:

- PJM's RTEP process ensures compliance with the mandatory reliability planning standards established by the North American Electric Reliability Corporation ("NERC") and approved by FERC.

- Failure to comply with these NERC standards threatens the reliability of the transmission grid by risking circuit overloads leading to degradation of electric service, voltage reductions (or brown-outs), rolling blackouts or even more catastrophic system blackouts, and could result in fines of up to $1 million per day upon PJM and its member companies.

- The need for the Project was first identified in the 2007 RTEP and has been confirmed in two subsequent analyses, including a March 2009 analysis that took into account the impact of the 2008 economic crisis and the resulting decline in projected load, which was the largest drop in forecasted load in PJM's history, yet still identified 23 planning criteria violations commencing in 2012.[3]

- The RTEP process considered as part of its baseline analysis, among other things, new generation, including renewable resources, demand response ("DR") and energy efficiency ("EE") initiatives, and considered other alternatives to the Project, such as lower voltage transmission lines and reconductoring.

- The Project was determined by PJM to be the most robust, and therefore optimal, solution to the 23 identified planning criteria violations. Moreover, the Project was in fact modeled as being in service in New Jersey's Energy Master Plan ("EMP").

Only Benjamin K. Sovacool, who submitted testimony on behalf of the Municipal Interveners,[4] even attempted to address PJM's RTEP analyses, but, as will be discussed

[3] If a subsequent RTEP analysis revises the need for or timing of the Project, the Company and PJM will abide by that determination.
[4] The "Municipal Interveners" are Hardwick Township, Fredon Township, Andover Township, Byram Township, Montville Township, Parsippany-Troy Hills Township, and East Hanover Township.

in this brief, that testimony does not in any material way undercut the overwhelming evidence presented by the PJM and PSE&G "need" witnesses. PSE&G has also demonstrated that the proposed route for the Project, which will be constructed entirely on existing right of way ("ROW"), would have the least impact on property owners and the least potential to permanently alter wooded wetlands and forested lands. Further, the evidence in the record establishes that the Project will not have a negative impact on property values and that the Project will not serve as a bar to property owners' receipt of mortgages from the Federal Housing Administration ("FHA"). In addition, PSE&G witness Robert Pollock has submitted undisputed evidence demonstrating the extent to which (i) PSE&G has taken additional steps to reduce environmental impacts associated with the Project and (ii) other permitting agencies, both at the state and federal level, will continue to review the Project from an environmental impact perspective.

The fundamental nature, characteristics and efficacy of the Project have not changed since the filing of the Petition in January 2009. However, throughout the ongoing engineering and design phase, the Company has made refinements that are typical for a project of this size and scope. Such refinements reflect the fact that PSE&G has taken steps to further reduce the impacts of the Project in response to community and regulatory input by, for example, utilizing monopoles to the greatest extent feasible, reducing the number of conductors and optimizing tower and access road locations. PSE&G has also offered to move two switching stations, which would reduce the number of required towers, lessen the impact on ecologically sensitive areas and, with respect to the eastern terminus switching station, move the station out of a residential neighborhood and on to an existing switching station site in an industrial/commercial area.

The Company's evidence also establishes that over 30 years of research has failed to demonstrate any causal link between EMF and adverse health effects on humans. Indeed, the evidence establishes that EMF is present in our daily lives due to the use of numerous electrical appliances, and that the peak EMF levels expected in 2013 associated with the Project are in the range of the EMF emitted from such appliances and are much lower than the transmission line edge-of-right-of-way magnetic field limits established by the States of Florida and New York – the only states having such limits.

For these reasons, and in order to meet PJM's June 1, 2012 in-service date, PSE&G requests that the BPU timely approve the subject Petition. Specifically, PSE&G seeks authority to begin construction of the Project as of the date of BPU approval in all areas of the proposed Project route that do not require receipt of a certificate, license, consent or permit to construct or disturb land from another state or federal agency with jurisdiction over aspects of the Project.

## II.

## REQUESTED RELIEF

The Company requests an Order (i) authorizing it unconditionally to commence construction immediately upon issuance of the Order, while recognizing the ongoing jurisdiction of other agencies, (ii) authorizing the construction of the requisite New Jersey switching stations at the alternate locations proposed by PSE&G in the Borough of Hopatcong and in Roseland, and (iii) permitting PSE&G to revise the Project as may be required or authorized by other agencies having jurisdiction over aspects of the Project.

1. Authorization to Construct

Consistent with prior Board Orders in comparable proceedings (see, e.g., In re Atlantic City Electric Company, 2005 WL 1130022, at 13 (N.J. Bd. Pub. Util., Order dated. Apr. 21, 2005 (Docket No. EE04111374)); I/M/O of the Amended Petition of Atlantic City Electric Company for a Determination Pursuant to the Provisions of N.J.S.A. 40:55D-19 etc., 2004 WL 1888408, at 5 (N.J. Bd. Pub. Util., Order dated June 15, 2004 (Docket No. EE02080521)), PSE&G requests authority to begin construction as of the date of BPU approval in all areas of the proposed Project route that do not require receipt of a certificate, license, consent or permit to construct or disturb land from another state or federal agency with jurisdiction over aspects of the Project and that, in furtherance thereof, the Board issue an Order providing that:

> Neither N.J.S.A. 40:55D-1, *et seq*., nor any governmental ordinances or regulations, permits or license requirements made under the authority thereof shall apply to the siting, installation, construction or operation of the Project, the transmission line corridors, nor to any of their appurtenant or associated facilities and structures to be constructed; and that PSE&G shall be permitted to proceed to commence and complete the construction and installation and shall proceed to energize and operate the Project, and all facilities appurtenant thereto.

PSE&G understands that the Order will not be construed to be a certificate, license, consent or permit to construct or disturb any land within the jurisdiction of other agencies such as the New Jersey Department of Environmental Protection, the New Jersey Highlands Council, the National Park Service or other entities as may be required by law or regulation to the extent that PSE&G needs to obtain approval or authorization from such agencies. However, PSE&G respectfully requests that the Order not be conditioned on receipt of any such approvals.

2. Switching Stations

PSE&G initially proposed locating the two requisite New Jersey switching stations in Jefferson Township and East Hanover Township. While these two locations remain feasible from an engineering perspective, and the Project could proceed with the switching stations at these locations, PSE&G has proposed alternative locations in the Borough of Hopatcong and Roseland, respectively. As discussed later in this brief, based on community and regulatory input obtained during the engineering and design phase of the Project, the Company has determined that the Hopatcong and Roseland sites have many advantages over the initially-proposed sites from environmental and community perspectives, and that location of the switching stations at these alternative sites would better serve the welfare of the public. Therefore, PSE&G requests that the Board authorize construction of the switching stations at the Hopatcong and Roseland sites.

3. Changes Made in Response to Other Agencies

The Project remains subject to the jurisdiction of other agencies and their permitting processes, and PSE&G has acknowledged that the Order will recognize that ongoing jurisdiction. Therefore, PSE&G also requests that the Order explicitly permit

adjustments and modifications to the Project either authorized or required by other regulatory agencies having jurisdiction over aspects of the Project.

## III.

## PROCEDURAL HISTORY

On January 12, 2009, PSE&G filed the Petition with the Board pursuant to N.J.S.A. 40:55D-19 requesting 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 Municipal Land Use Act of the State of New Jersey shall not apply to the siting, construction or operation of the Project. A copy of the Petition was duly served upon each of the affected municipalities as required by law. The Petition was accompanied by pre-filed direct testimony from the following thirteen witnesses concerning the four primary elements of the case identified under the "Preliminary Statement" above:

(1) Need for the Project:

- Esam A.F. Khadr, Director, Electric Delivery Planning, PSE&G (P-1)
- Steven R. Herling, Vice President of Planning for PJM (P-11)
- Paul F. McGlynn, Manager, PJM Transmission Planning Department (P-12)
- John M. Reynolds, Senior Economic Analyst, PJM Capacity Adequacy Planning Department (P-13)

(2) Routing for the Project:

- John P. Ribardo, PSE&G Manager Transmission Projects (Exhibit P-2)
- Robert Pollock, PSE&G Manager of Transmission Permitting (Exhibit P-3)
- Robert L.Gibbs, PSE&G Manager of Corporate Properties[5] (Exhibit P-4)
- Jack Halpern, Louis Berger Group (Exhibit P-8)

(3) Construction/Engineering:

[5] Shortly before the filing of this matter with the Board, Mr. Gibbs resigned his position as PSEG Services Corporation -- Manager of Corporate Properties and assumed a different position within PSEG. As a result, Mr. Gibbs' involvement with this Project ceased. Richard Franklin assumed Mr. Gibbs' job responsibilities and title. On September 2, 2009, PSE&G pre-filed supplemental direct testimony on behalf of Mr. Franklin (Exhibit P-16) in which Mr. Franklin adopted, with minor modifications, the pre-filed testimony of Mr. Gibbs.

- Richard F. Crouch, PSE&G Senior Project Manager, Transmission Outside Plant Construction (Exhibit P-5)
- Richard I. Jacober, Black and Veatch Project Mgr. (Exhibit P-6)
- Robert J. Millies, Commonwealth Associates Inc. High Voltage Transmission Design Project Mgr. (Exhibit P-7)

(4) EMF

- Kyle G. King, K&R Consulting, Inc. (Exhibit P-9)
- William H. Bailey, Ph.D., Principal Scientist and Dir., Exponent, Inc. (Exhibit P-10)

On January 16, 2009, PSE&G re-circulated the petition to the BPU and the affected municipalities due to an administrative oversight in the initial submission.

The Board conducted a prehearing conference on February 26, 2009. Following the prehearing conference, the Board issued a Prehearing Order on March 12, 2009 establishing the nature of the proceeding and issues to be resolved; the time to file intervention motions; a procedural and discovery schedule; and hearing dates ("March 12th Order"). Subsequently, the Board confirmed that jurisdiction in this matter would be reserved by the Board pursuant to N.J.S.A. 52:14F-8(b) and designated Commissioner Joseph L. Fiordaliso as the Presiding Officer.

In addition to the involvement in this proceeding as parties of Board Staff and the New Jersey Department of the Public Advocate, Division of Rate Counsel ("Rate Counsel"), motions for intervention were granted by the Board on April 30, 2009 to Hardwick Township, Fredon Township, Andover Township, Byram Township, Montville Township, Parsippany-Troy Hills Township and East Hanover Township (together, "Municipal Interveners"); Montville Board of Education ("Montville BOE"); Willow Lake Day Camp ("Willow Lake"); Environment New Jersey, The New Jersey Highlands Coalition, Sierra Club-New Jersey Chapter and the New Jersey Environmental Federation

(together, "Environmental Interveners"); Stop the Lines ("STL"); Exelon Corporation ("Exelon"); Gerdau-Ameristeel Corporation ("Gerdau"); Fredon Township School District ("Fredon BOE"); Fredon Parents Against the Lines ("Fredon PALS"); and Deborah E. Kelly, Peggy Norris, David Cinnater, and the Estate of William Cinnater ("Estate of William Cinnater"). The National Park Service ("NPS") filed for and received participant status.

The March 12th Order established a rolling discovery period affording the intervening parties until May 15, 2009 to conduct discovery on PSE&G's application. In response to a joint submission by Fredon BOE, Willow Lake and Parsippany-Troy Hills Township requesting an extension of the discovery period, on May 13, 2009, Commissioner Fiordaliso issued an order amending the procedural schedule to extend the discovery period to June 5, 2009. Extensive discovery was conducted by the intervening parties, with most parties propounding several rounds of discovery. In all, PSE&G provided responses to over 1,500 data requests, many with multiple parts. Additionally, throughout the discovery process, PSE&G provided the Board and the parties with updated Project designs and refinements resulting from efforts by PSE&G to work with affected municipalities, individual property owners and state governmental agencies to optimize Project design and minimize associated impacts.

Pursuant to the March 12th Order, motions for PSE&G to set aside an escrow account for the purpose of paying for intervener legal and expert costs were filed on or about April 1, 2009 by Byram Township, Montville Township, Andover Township, East Hanover Township, Parsippany-Troy Hills Township, Fredon Township, Fredon BOE, Willow Lake, STL, and the Environmental Interveners. PSE&G filed a brief in

opposition, arguing that requiring PSE&G to pay the litigation costs of intervening parties is without legal support and contrary to established Board policy. The Board denied the escrow motions on May 14, 2009 and issued a confirming Order dated May 29, 2009. Notwithstanding its denial, the confirming Order noted that PSE&G and the Municipal Interveners had separately reached agreement to establish a $300,000 escrow account for the Municipal Interveners to use to help fund their participation in the proceeding.

Commissioner Fiordaliso presided over two public hearings, on June 11, 2009 and June 18, 2009, in the Sussex County Community College Theater in Newton, New Jersey, Sussex County. He presided over a third public hearing on June 30, 2009 in the Frelinghuysen Arboretum in Morristown, New Jersey, Essex County.[6] All three public hearings were well-attended, with Commissioner Fiordaliso taking comments from the public for upwards of four hours at each hearing. A significant majority of the comments and concerns expressed about the Project, particularly at the first two public hearings, came from the parents of children attending the Fredon Elementary School.[7]

On June 26, 2009, the New Jersey Highlands Council ("Highlands Council") voted in favor of a Comprehensive Mitigation Plan ("Mitigation Plan") submitted in May 2009 by PSE&G as an amendment to its September 5, 2008 Highlands Applicability Determination. In the Mitigation Plan, which was based upon input from the New Jersey Department of Environmental Protection, the Highlands Council and the public, PSE&G expressed a willingness to take certain actions to reduce environmental impacts in the

---

[6] PSE&G filed with the Board copies of the Affidavits and Proofs of Publication of notice of the public hearings in newspapers of broad circulation. Those documents are a part of the record in this proceeding. *See* Exhibit P-14.

[7] See Transcripts of the public hearings in this docket.

Highlands Region -- a statutorily protected region of the State -- in order to better recognize the sensitive resources within the Highlands Region that would be traversed by the upgraded utility line, while still enabling PSE&G to continue to ensure safe, adequate and proper electric service in accordance with N.J.S.A. 48:2-1 et seq. As part of the Mitigation Plan, PSE&G expressed a willingness to move the Jefferson switching station to the Borough of Hopatcong.

On or about July 10, 2009, certain intervening parties filed the following pre-filed direct testimony:

- The Municipal Interveners filed the testimony of Benjamin K. Sovacool concerning the need for the Project and the testimony of Steven Balzano concerning necessary regulatory approvals in addition to BPU approval.[8]

- Fredon BOE and Willow Lake jointly filed the testimony of Martin Blank, Ph.D. concerning EMF.

- STL filed the testimony of Helene Jaros concerning the ability to obtain Federal Housing Administration ("FHA") mortgages for properties in close proximity to transmission lines.

On July 22, 2009, PSE&G propounded discovery requests related to each of the intervener witnesses. On July 30, 2009, counsel for the Municipal Interveners, Fredon BOE and Willow Lake filed a request with the Board seeking additional time to respond to PSE&G's discovery requests. PSE&G did not object to this request and, on or about July 30, 2009, the Board issued a modified scheduling order extending to August 18, 2009 the time for interveners to provide responses to PSE&G. The due date for PSE&G's Rebuttal Testimony was also extended to September 2, 2009.

On August 13, 2009, Commissioner Fiordaliso conducted an independent on-the-record site visit stopping at the Delaware Water Gap Natural Resource Area, Millbrook

[8] On July 29, 2009, PSE&G filed a motion to strike the testimony of Steven Balzano. The Municipal Interveners subsequently decided to withdraw Mr. Balzano's testimony from this proceeding.

Village site; the Fredon Township School; and East Hanover Township.[9] On September 1, 2009, Commissioner Fiordaliso issued a site visit report that documented his observations.

On August 21, 2009, PSE&G filed a letter with Commissioner Fiordaliso advising the Board and the parties that, in accordance with the Mitigation Plan accepted and approved by the Highlands Council on June 26, 2009, it was willing to relocate a required switching station included as part of the Project from Jefferson Township to the Borough of Hopatcong, which would significantly reduce the impacts from the Project. In furtherance of the Mitigation Plan, PSE&G had moved forward with developing designs and ascertaining the need for the acquisition of additional property to build the switching station in Hopatcong, and updated design drawings were also provided to the parties with the August 21 letter.[10]

On September 2, 2009, PSE&G served the parties with Rebuttal Testimony from the following witnesses:

- Esam A.F. Khadr – Exhibit P-15
- Richard Franklin – Exhibit P-16
- Kyle G. King – Exhibit P-17
- William H. Bailey, Ph.D. – Exhibit P-18
- Steven R. Herling – Exhibit P-19
- Paul F. McGlynn – Exhibit P-20
- John M. Reynolds – Exhibit P-21

Shortly thereafter, on September 16, 2009 and September 21, 2009, respectively, Fredon PALS and Fredon BOE filed notices of withdrawal from the proceeding following the execution of a comprehensive settlement resolving all issues in dispute with PSE&G.

---

[9] On June 23, 2009, Board Staff also conducted an informal site visit to various sites along the proposed Project route.

[10] *See* PSE&G Letter to Commissioner Fiordaliso dated August 21, 2009, which was distributed to all parties.

Fredon BOE also withdrew its sponsorship of the pre-filed testimony of Martin Blank, Ph.D.

On November 6, 2009, ten days prior to the scheduled start of the evidentiary hearings in this matter, the Municipal Interveners, Environmental Interveners and STL jointly filed an untimely motion to dismiss PSE&G's Petition. The Board conducted a telephone pre-hearing conference on November 9, 2009 and indicated that the hearings would not be delayed based on the interveners' motion to dismiss. The Board also established that PSE&G would present its witnesses in panels and in the following order: (1) Routing; (2) Construction/Engineering; (3) Need; and (4) EMF.

The Municipal Interveners made two requests with respect to intervener witnesses. First, the Municipal Interveners stated that, due to scheduling conflicts, Dr. Sovacool would be unavailable for the evidentiary hearings. The Municipal Interveners requested that Christopher Cooper, an associate of Dr. Sovacool, be permitted to adopt Dr. Sovacool's testimony and testify on his behalf. Second, indication was given that Willow Lake would no longer be sponsoring the testimony of Martin Blank, Ph.D. The Municipal Interveners requested the opportunity to sponsor Dr. Blank even though they had not originally sponsored him. Both requests were granted without objection. Pre-filed testimony was stipulated into the record, but it was determined that any discovery responses utilized at hearing would need to be introduced at the hearing and moved into evidence at that time. DAG Kerri Kirschbaum issued a November 9, 2009 letter memorializing the hearing process agreed upon during the telephone pre-hearing conference.

Commissioner Fiordaliso presided over evidentiary hearings on November 16, 18, 19, 20 and 23, 2009. Prior to the presentation of testimony, Commissioner Fiordaliso addressed the interveners' motion to dismiss as follows:

> I would now like to address the motion to strike that the Municipal Intervenors, the Environmental Intervenors and Stop-the-Line filed on November 6, 2009.
>
> After the November 9, 2009 prehearing conference where the issue of the timeliness of the motion was discussed, the Intervenors submitted a clarification suggesting that the motion is not a motion for summary judgment, but that even if it were the Board should be lenient with the time constraints contained in N.J.A.C. 1:1-12.5. It is also suggested that the motion may be treated as a motion for emergent relief similar to a motion for a stay.
>
> At this time I am not making a substantive ruling on the motion. In light of the timing and in the absence of an opportunity for the parties adequately to respond to the motion, I am suspending consideration of the motion pending the hearing. If at the close of the hearings the Intervenors wish to refile a similar motion, we can discuss a procedural schedule for such a motion at that time.
>
> I do not believe that allowing this hearing to proceed today will result in any harm to the parties, especially in light of the opportunity to conduct cross on the issues raised in the motion.
>
> Next I would like to address Ms. Tamasic's (*sic*) letter of November 13, 2009, wherein she requests that the Board reject the petition because it is unfinished and not ready to be heard due to updated discovery responses filed by PSE&G on Thursday, November 12, 2009, and Friday, November 13, 2009. I understand the Intervenors' concerns with respect to last minute updates and changes to the routing and/or construction of the project and updated information on the issues. Nonetheless, I am not going to penalize the Company for continuing to work with the affected municipalities throughout this process to try to minimize the impact of the proposed project.

1T:7-1 to 8-16.[11] So as to afford the interveners additional time to review the most recent Project designs and refinements associated primarily with PSE&G's offer to relocate two switching stations in accordance with the Mitigation Plan approved by the Highlands Council and concerns expressed by East Hanover Township**,** Commissioner Fiordaliso requested that PSE&G bring back on the last day of hearings certain witnesses requested by the interveners for supplemental limited cross-examination on the updated discovery responses containing that information. Commissioner Fiordaliso also requested that PSE&G bring back Mr. Khadr for supplemental limited cross-examination concerning a leakage analysis Mr. Khadr had performed in response to discovery requests from Board Staff.

During the hearings, parties introduced their respective pre-filed testimonies and exhibits, several hundred specific discovery responses were moved into evidence and witnesses were cross-examined. At the conclusion of the evidentiary hearings, Commissioner Fiordaliso, in coordination with the parties, established a briefing schedule with Initial Briefs due December 28, 2009 and Reply Briefs due January 6, 2010. Commissioner Fiordaliso also set a Board decision date of January 15, 2010. 5T:1287-25 to 1288-3.

Although not establishing a formal settlement process, Commissioner Fiordaliso encouraged the parties to explore settlement. 5T:1288-4 to 1288-20. In response, Board Staff facilitated a settlement conference for all interested parties on December 16, 2009.

---

[11] Transcripts of the hearings in this matter are identified as follows:
1T = transcripts from the November 16, 2009 hearing
2T = transcripts from the November 18, 2009 hearing
3T = transcripts from the November 19, 2009 hearing
4T = transcripts from the November 20, 2009 hearing
5T = transcripts from the November 23, 2009 hearing
followed by page-line references.

In addition to Board Staff, PSE&G, Municipal Interveners, Montville BOE, STL and Rate Counsel participated in these discussions. PSE&G has also conducted three settlement meetings with individual parties since the conclusion of the evidentiary hearings. No settlements have yet resulted from these meetings.

## IV.

## STATEMENT OF FACTS

In this proceeding, PSE&G seeks a determination under N.J.S.A. 40:55D-19 that the construction of the proposed 500 kV Susquehanna-Roseland transmission system reliability upgrade is "reasonably necessary for the service, convenience or welfare of the public," and, in accordance with this determination, a Board order that the zoning, site plan review and all other municipal land use ordinances or regulations promulgated under Title 40 of the New Jersey Statutes and the Municipal Land Use Law of the State of New Jersey shall not apply to the siting, construction or operation of the Project.

PSE&G, a corporation duly organized and existing under the laws of the State of New Jersey, is engaged principally in the transmission and distribution of electric energy and gas service to 2.1 million electric customers and 1.7 million gas customers in New Jersey and is an electric and gas public utility as those terms are defined within Title 48 of the New Jersey statutes. As such, it is subject to the jurisdiction of the Board.

PSE&G has turned over the operational control of its electric transmission system to PJM, which is the RTO approved by FERC for a centrally dispatched control area comprising all or parts of several states and the District of Columbia.[12] The Company's transmission and distribution lines span approximately 23,000 circuit miles and cover a service territory of approximately 2,600 square miles running diagonally across New Jersey from Bergen County in the northeastern area of the State to an area below the City of Camden in the southwestern portion of the State. PSE&G is responsible for ensuring

[12] Pursuant to FERC Orders, PJM is responsible for planning and operating the electric transmission system within its footprint in a reliable manner. The PJM footprint includes 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.

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 in New Jersey and is a provider of last resort under the Electric Discount and Energy Competition Act, N.J.S.A. 48:3-49 *et seq.*

PSE&G is a transmission owner in PJM and a signatory to the PJM Consolidated Transmission Owners Agreement ("TOA").[13] PJM is responsible for planning the region's transmission grid to maintain reliability within established reliability standards. Through its RTEP process PJM identifies transmission system upgrades, expansions and enhancements that are necessary to ensure the reliability of the PJM transmission system.[14] The protocol for PJM's RTEP process is set forth in Schedule 6 of the Amended and Restated Operating Agreement of PJM ("PJM Operating Agreement").[15] The RTEP process is described in more detail in Section V. B below.

The need for the Project was identified in PJM's 2007 RTEP and approved at the June 22, 2007 PJM Board of Managers meeting for inclusion in the PJM RTEP because it was determined by PJM to be the best solution to address the identified reliability criteria violations. The need for the Project was then confirmed in the 2008 RTEP and in a third analysis in March 2009, with the March 2009 analysis identifying 23 violations of the FERC-approved NERC reliability standards on critical 230 kV circuits in eastern

---

[13] Consolidated Transmission Owners Agreement, Rate Schedule FERC No. 42 (March 19, 2006), available at http://www.pjm.com/documents/downloads/agreements/toa.pdf.

[14] PJM Interconnection, L.L.C., FERC Electric Tariff, Sixth Revised Vol. 1 at Schedule 12; PJM Operating Agreement at Schedule 6.

[15] PJM Operating Agreement at Schedule 6. On December 7, 2007, PJM proposed amendments to the provisions of the RTEP process contained in the PJM Operating Agreement to comply with the requirements of Order No. 890. *Preventing Undue Discrimination and Preference in Transmission Service*, Order No. 890, 72 Fed. Reg. 12,266 (Mar. 15, 2007), FERC Stats. and Regs. Para. 31,241 (2007). On May 15, 2008, FERC issued an Order accepting PJM's compliance filing. *PJM Interconnection, L.L.C.*, 123 FERC Para. 61,163 (2008), *reh'g denied*, 124 FERC Para. 61,187 (2008).

Pennsylvania and northern New Jersey in the transmission zones of PSE&G, PPL Electric Utilities Corporation ("PPL Electric"), PECO Energy, Metropolitan Edison Company and Jersey Central Power & Light Company, which violations will begin occurring as early as 2012.[16]

The Project is a 145-mile, 500 kV transmission line that will run from PPL Electric's Susquehanna switching station in Salem Township, Pennsylvania, through intervening switching stations in eastern Pennsylvania, proceed southeast towards Bushkill, where it will cross the Delaware River in the vicinity of the Delaware Water Gap, and then join the New Jersey segment, proceeding to the existing Branchburg to Ramapo 500 kV transmission circuit where a new switching station would be constructed. From the new switching station, the line would extend to another switching station in northern New Jersey.[17]

PSE&G conducted an extensive, multi-faceted analysis to determine the preferred route for the New Jersey portion of the Project.[18] The New Jersey segment of the Project spans approximately 45 miles through 16 municipalities[19] and will be constructed almost exclusively on existing ROW, consistent with N.J.A.C. 14:5-7.1. In New Jersey, the Project will cross approximately two miles of federal land operated by NPS, freshwater wetlands, the Picatinny Arsenal, the Kittatinny Mountains and the New Jersey Highlands

---

[16] See Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 5-7 to 7-10; 12-17 to 16-16; Exhibit P-11 (Direct Testimony of Steven R. Herling) at 24-10 to 25-4.
[17] See Exhibit P-1 (Direct Testimony of Esam A.F. Khard) at 16-1 to 16-21; Exhibit P-11 (Direct Testimony of Steven R. Herling) at 32-1 to 32-13; Exhibit P-5 (Direct Testimony of Richard F. Crouch) and Exhibit RFC-3a thereto. See also, 3T:699-14 to 700-1.
[18] See Exhibit P-8 (Direct Testimony of Jack Halpern) at JH-1 attached thereto.
[19] The affected municipalities are: (1) Andover Township; (2) Boonton Township; (3) Byram Township; (4) East Hanover Township; (5) Fredon Township; (6) Hardwick Township; (7) Hopatcong Borough; (8) Jefferson Township; (9) Kinnelon Borough; (10) Montville Township; (11) Newton Township; (12) Parsippany-Troy Hills Township; (13) Rockaway Township; (14) Roseland Borough; (15) Sparta Township; and (16) Stillwater Township.

Region. Additionally, the New Jersey portion of the Project requires the construction of two switching stations – one in the western portion of the line and one in the eastern portion. These stations can be constructed either in Jefferson Township or the Borough of Hopatcong in the west and either in East Hanover Township or at an existing PSE&G switching station in Roseland in the east, where a 500/230 kV transformer will be installed.[20] The cost to construct the New Jersey 45-mile segment of the Project is estimated at $750 million.

[20] See Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 8-1 to 9-5. See also 2T:527-3 to 528-8; 5T:1187-4 to 1188-1.

## V.

## DISCUSSION

### A. APPLICABLE LEGAL PRINCIPLES

The legal standard applicable to a review of an application under N.J.S.A. 40:55D-19 is well-established. Specifically, decisions of both the courts and the Board itself have set forth certain key considerations that should guide the Board's statutory review.

In In re Public Service Elec. & Gas Co., 35 N.J. 358, 376-377 (1961) ("Public Service I"), the New Jersey Supreme Court summarized the applicable principles in interpreting the substantively equivalent predecessor to N.J.S.A. 40:55D-19,[21] as follows ("recapitulat[ing]" In re Hackensack Water Company, 41 N.J. Super. 408 (App. Div. 1956) ("Hackensack Water")):

> 1. The statutory phrase, 'for the service, convenience and welfare of the public' refers to the whole 'public' served by the utility and *not the limited local group benefited by the zoning ordinance* [emphasis added].
>
> 2. The utility must show that the proposed use is reasonably, *not absolutely or indispensably,* necessary for public service, convenience and welfare at some location [emphasis added].
>
> 3. It is the 'situation', i.e., the particular site or location . . . which must be found 'reasonably necessary,' so the Board must consider the community zone plan and zoning ordinance, as well as the physical characteristics of the plot involved and the surrounding neighborhood, and the effect of the proposed use thereon.
>
> 4. Alternative sites or methods and their comparative advantages and disadvantages to all interests involved, *including cost*, must be considered in determining such reasonable necessity [emphasis added].

[21] "[T]he standards for both the old statute and the current statute are virtually identical . . . ." *In re Atlantic City Electric Company*, 1993 WL 241916, at 4 (N.J. Bd. Reg. Com., Order dated. Feb. 3, 1993 (Docket No. EE91111747)).

5. The Board's obligation is to weigh all interests and factors in the light of the entire factual picture and adjudicate the existence or non-existence of reasonable necessity therefrom. *If the balance is equal, the utility is entitled to the preference, because the legislative intent is clear that the broad public interest to be served is greater than local considerations* [emphasis added].

These fundamental principles have been recognized and applied by the Board in more recent decisions granting similar requests by other utilities for rulings under N.J.S.A. 40:55D-19 in connection with proposed new transmission lines. *See*, *e.g.*, In re Atlantic City Electric Company, 2005 WL 1130022, at 3 (N.J. Bd. Pub. Util., Order dated. Apr. 21, 2005 (Docket No. EE04111374)); I/M/O of the Amended Petition of Atlantic City Electric Company for a Determination Pursuant to the Provisions of N.J.S.A. 40:55D-19 etc., 2004 WL 1888408, at 2-3 (N.J. Bd. Pub. Util., Order dated. June 15, 2004 (Docket No. EE02080521)).

As further stated in Hackensack Water (at 423), the "legislative intent is clear that . . . local regulation, however beneficial and important, is of secondary importance to the broader public interest . . . ." See, also, Petition of Monmouth Consolidated Water Company, 47 N.J. 251, 258 (1966) ("Monmouth Water"); Public Service I at 377.

Indeed, the "[d]ecision as to whether facilities should be enlarged or be extended within a municipality, and, if so, where they should be located, rests with utility management in the first instance," (Monmouth Water at 258-259), with "the burden of demonstrating a feasible alternative method . . . to devolve on the objectors" (Hackensack Water at 426-427). As the Hackensack Water court explained:

> We do not think it obligatory on the utility to set up a lot of straw men and then knock them down. As part of its case in establishing basic necessity for the improvement itself . . . it should, however, show that the means or method proposed to meet the public need is reasonable and desirable, perhaps *in relation to customary practices and methods in the industry and the company's existing methods*, as well as any other pertinent factors, including any substantially greater expense of an alternative method . . . .

Id. at 426 (emphasis added).

Of course, the BPU's duty goes beyond a mere "rubber stamp of approval on the utility's choice" and must include an assessment of whether the utility acted wantonly, capriciously or unreasonably (id. at 419). In addition, the BPU must review the utility's determination and, among other things, assess whether other and "equally serviceable" sites are reasonably available that would have less impact on the local zoning scheme (Monmouth Water at 259-260). In this review, the Board is to consider, among other things, whether other locations would be "less likely to cause injury to the neighborhood" or have other "comparative advantages" over the selected locations (Hackensack Water at 426). See also, Application of Jersey Central Power & Light Co., 130 N.J. Super. 394, 399 (App. Div. 1974).

As will be discussed below, application of these principles to the facts of this case requires a decision allowing the Project to proceed.

## B. NEED

### 1. *The indisputable evidence in the record overwhelmingly supports the need for the Susquehanna-Roseland Project*

#### a. Transmission System Overview

In reviewing the need for the Project, it is important to understand the vital role transmission reliability planning plays in ensuring the continued provision of reliable electric service to customers. Transmission lines have a maximum rated thermal capacity, which is the maximum electrical current they can safely carry. When a transmission line overloads, the conductor, the hardware securing the conductor, and the line terminal equipment begin to overheat. Overheating the conductor beyond its design parameters will cause the premature failure of the conductor and may cause the line to

sag beyond its design limits possibly violating National Electrical Safety Code ("NESC") clearance criteria. Under these conditions, the metal in the conductor may become brittle, rendering it useless. In addition, the line may break and fall to the ground causing a potentially dangerous situation for those near the line, as well as the crews required to respond to the event. Overloading transmission lines may cause permanent damage to transmission infrastructure and catastrophic power outages. Petition at 11, ¶23; Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 9-7 to 10-12; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 18.

The nation's interconnected transmission grid serves as the backbone for the safe and reliable delivery of large amounts of electricity from generation stations over substantial distances to customers served from the local distribution system. It is critically important that this interconnected transmission system be planned and designed to be highly reliable so that reliable service can be provided under peak loading conditions and when certain elements of the system are out of service due to planned or forced outages. Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 11; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 6. Short-term operational actions, such as turning specific generating plants on or off, opening or closing specific transmission lines or disconnecting electric service to certain groups of customers, do not solve underlying problems. That is the purpose of planning as distinguished from operations – to design the system and plan for contingencies to prevent transmission line overloads from occurring in the first place. On a long-term basis, construction of additional transmission is necessary. Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 10; Exhibit P-11

(Direct Testimony of Steven R. Herling) at 30-31; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 18-19.

Moreover, as new renewable generation resources are developed, improvements to electric transmission infrastructure will enable new generation resources to reach and benefit customers. There are approximately 86,000 MW of generating resources currently under development in the PJM Interconnection queue. Of these, approximately 44,000 MW are wind generators and over 85 percent of those projects are in western PJM. Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 11; *see also* Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 23 and Exhibit EAK-6 thereto; 3T:670-6 to 671-3.

For these reasons, it is important that the interconnected transmission system continue to be upgraded and reinforced by transmission upgrades such as the Project.

**b. Transmission Planning Process Overview**

In order to ensure reliable service, electric utilities and RTOs, such as PJM, engage in an extensive FERC-approved transmission planning process. This process generally employs a five and fifteen year planning horizon and, among other things, tests the system to determine whether reliable service can be maintained under various possible operating conditions. 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.

Transmission planning incorporates the forecast of the peak load that the transmission system must be able to carry. Peak load forecasts are developed annually based on historic economic activity as measured by various indices and historic peak

demands. Exhibit P-13 (Direct Testimony of John M. Reynolds) at 4 and Exhibit JMR-2 thereto; Exhibit P-21 (Rebuttal Testimony of John M. Reynolds) at 4-5. These econometric indices are then used to develop projected load forecasts over a wide range of possible weather conditions. The annual load forecast then serves as the basis for projecting peak load on the transmission system under different conditions. For example, PJM uses its annual peak load forecast to test its transmission system under statistically normal peak weather conditions (*i.e.*, the 50/50 load forecast) and under emergency weather conditions (*i.e.*, the 90/10 load forecast).[22]

Transmission planners first test the system under normal operating conditions, *i.e.*, all elements of the system are in service at the time of peak load on the system. The planners then "stress" the system by simulating the removal or reduced availability of one or more elements of the system from service to determine if the resulting loadings on the remaining transmission lines or related facilities would exceed their maximum thermal rating capability or operate outside of their design voltage levels. Such circumstances, if they occur, are typically referred to as "violations" of planning criteria. Exhibit P-12 (Direct Testimony of Paul McGlynn) at 7-11 to 9-6; Exhibit P-20 (Rebuttal Testimony of Paul F. McGlynn) at 3-1 to 7-18.

Where violations are shown, the system planners undertake extensive analyses to find solutions that will resolve the violations. After examining available alternatives, the

[22] PJM's 50/50 load forecast is a projection of the system peak load assuming normal, or average, peak summer weather conditions. That is, based on historical data, the forecast has a 50 percent probability of being exceeded based on more severe weather. PJM's 90/10 load forecast is a more severe load forecast and is intended to represent very hot weather with the forecast having only a 10 percent probability of being exceeded by even hotter weather. 3T:607-18 to 607-23; 4T:808-5 to 808-12.

planners select the best solution, considering a variety of factors, including whether and to what degree the proposed solution resolves the violations and for how long.

### c. PJM's Transmission Planning Process Incorporates NERC Reliability Standards

Prior to 2005, reliability standards were established by the North American Reliability Council, a predecessor to NERC, individual power pools and local electric companies. Reliability Council standards were guidelines, as opposed to enforceable standards, but were generally followed by transmission planners. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 19. Following the occurrence of the August 14, 2003 black-out, and subsequent investigations undertaken to determine the cause of the blackout, Congress passed the Energy Policy Act of 2005 ("EPAct 2005"),[23] and in particular, added Section 215 to the Federal Power Act. Id. Section 215 required FERC to certify an Electric Reliability Organization ("ERO") to develop mandatory and enforceable reliability standards, which are subject to FERC review and approval. Once approved, the reliability standards may be enforced by the ERO, subject to FERC oversight.[24]

On February 3, 2006, FERC certified NERC as the ERO.[25] Thereafter, NERC developed reliability standards, which apply to users, owners and operators of the bulk electric system, and are subject to FERC review and approval. The NERC reliability standards define the reliability requirements for planning and operating the North American bulk electric system, which includes all of PJM. In addition, EPAct 2005

[23] 42 U.S.C. §§16511-14 (2009).
[24] 16 U.S.C. § 824o(e)(3).
[25] *North American Electric Reliability Corp.*, 116 FERC ¶ 61,062 (ERO Certification Order), order on reh'g & compliance, 117 FERC ¶ 61,126 (ERO Rehearing Order) (2006), order on compliance, 118 FERC ¶ 61,030 (2007) (January 2007 Compliance Order).

provided NERC, as the ERO, with the legal authority to enforce compliance with its Reliability Standards, subject to FERC oversight. NERC achieves compliance through monitoring, audits and investigations, the imposition of financial penalties, and other enforcement actions for non-compliance. 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 5-7 to 7-2. There are currently over 120 FERC-approved reliability standards that are monitored and enforced by NERC and the regional reliability organizations that function under its auspices.[26] These FERC-approved NERC reliability standards are mandatory and failure to comply can result in penalties of up to $1 million per day per violation, which may be imposed upon Responsible Entities such as PJM and PSE&G. Id.[27]

In addition, NERC works closely with eight regional reliability organizations, known as Regional Entities. The Regional Entities have delegated authorities and responsibilities, as approved by FERC, to enforce NERC and regional reliability standards, and perform other standards-related functions assigned by NERC.[28] The Regional Entity for the Mid-Atlantic region is Reliability*First* Corporation ("RFC"). RFC's primary responsibilities include: developing regional reliability standards; monitoring compliance with those reliability standards for all owners, operators, and users of the bulk electric system; and providing seasonal and long-term assessments of

---

[26] 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).

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

[28] See *North American Electric Reliability Corp.*, 119 FERC ¶ 61,060, order on reh'g, 120 FERC ¶ 61,260 (2007). See also *Mandatory Reliability Standards for Critical Infrastructure Protection*, Order No. 706, 122 FERC ¶ 61,040 (2008).

bulk electric system reliability within its region. RFC member companies, including PJM and PSE&G, operate in thirteen states and the District of Columbia.[29] Through its membership in RFC, PJM is registered as a Responsible Entity for, among other things, the following functions: Reliability Coordinator, Transmission Operator and Transmission Planner. As a Responsible Entity for these functions, PJM must comply with approved NERC and RFC reliability standards. 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.

NERC reliability standards apply to the "bulk electric system," which generally includes transmission facilities operated at voltages of 100 kV or higher.[30] PJM, as a Responsible Entity, ensures compliance with NERC and regional transmission planning reliability standards through its RTEP process, which is described in detail below. Petition at 4-5, ¶7; Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 11-13; Exhibit P-11 (Direct Testimony of Steven R. Herling) at 14-15; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 3-13 to 7-2.

NERC reliability standards require PJM to identify the "critical system conditions" against which the system must be evaluated to ensure that it meets the performance criteria specified in the standards. Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 12; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 5-9. As

---

[29] Id. See also Petition at 5, ¶8.

[30] See *Mandatory Reliability Standards for the Bulk Power System*, Order No. 693, FERC Stats. & Regs. ¶ 31,242, at P 77 (FERC Docket No. RM06-16-000) (dated April 4, 2007). Radial transmission facilities serving only load with one transmission source are typically not included in this definition.

relevant to this proceeding, NERC reliability standards are broken down into three categories, "A," "B," and "C," and can be summarized as follows:[31]

- NERC Category A criteria require that, with all facilities in service, equipment thermal ratings and system voltage levels be within applicable limits and that the system be stable.
- NERC Category B criteria impose similar requirements with one facility removed from service. This is referred to as the "n minus 1" or "n-1" criteria or single contingency test. These criteria ensure that the system continues to remain reliable upon the instantaneous outage of a transmission element.
- NERC Category C criteria require the system to be stable and within applicable equipment thermal ratings and system voltage limits for less probable contingency events, including the loss of two facilities, either simultaneously or sequentially.[32]

Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 11-12; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 6.

**d. PJM's RTEP Process is Open, Transparent and Incorporates Many Factors Into Its Planning Analysis.**

As an RTO, PJM plans and operates the integrated bulk electric system for the entire PJM footprint and administers the power markets in the PJM region. As part of its responsibilities, PJM undertakes a coordinated and open transmission planning process. PJM's role expanded in 2007 under FERC Order No. 890, which amended PJM's existing tariff to require coordinated, open, and transparent transmission planning on both a local and regional level.[33] In addition, FERC required that transmission providers, such

[31] There are other categories of standards, e.g., NERC Category "D," but they are not relevant to this proceeding.

[32] The NERC Reliability Standards identify nine different Category C criteria. These criteria include violations where the loss of one system element is followed by system readjustments, and then the loss of a second system element. These are also referred to as the "n minus 1 minus 1" or "n-1-1" criteria. Other NERC Category C criteria include events such as the simultaneous loss of two circuits on a single tower or for a single faulted system element followed by a circuit breaker failing to operate, which is referred to as a stuck breaker. Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 6.

[33] . *Preventing Undue Discrimination and Preference in Transmission Service*, Order No. 890, 72 Fed. Reg. 12,266 (Mar. 15, 2007), FERC Stats. and Regs. ¶ 31,241 at. p. 435 (2007) (Order No. 890).

as PJM, coordinate with interconnected systems. Id. at 523. FERC stated that regional coordination would ensure the feasibility of simultaneously planned projects and the ability to identify system enhancements that could relieve congestion or integrate new resources. Id. Further, FERC determined that:

> Greater coordination of planning on a regional basis will also increase efficiency through the coordination of transmission upgrades that have region-wide benefits, as opposed to pursuing transmission expansion on a piecemeal basis.

Id. at 524.

PJM's RTEP process is open, transparent and collaborative. 3T:636-7 to 636-15; 3T:716-14 to 716-23. All assumptions, analyses and decisions are subject to stakeholder review and participation. PJM's Transmission Expansion Advisory Committee ("TEAC") is the primary forum for stakeholder input into the PJM analyses. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 36-7 to 36-10. The TEAC is open to participation by: (i) all transmission customers; (ii) any other entity proposing to build transmission facilities to be integrated into the PJM region; (iii) all PJM members; (iv) state commissions and consumer advocates; and (v) any other interested entities or persons. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 11-12 to 13-6.

The RTEP and all stakeholder comments are submitted to the PJM Board for its review in determining whether to approve the proposed RTEP. PJM, pursuant to its FERC-approved Open Access Transmission Tariff and based upon the analysis completed through the FERC-approved RTEP process, determines what transmission upgrades are needed to meet NERC reliability standards. Following approval of the RTEP by the PJM Board, PJM directs the appropriate transmission owners to complete the necessary transmission system upgrades. Id. at 11-13, 21; 3T:699-1 to 700-1. The

cost of the projects is allocated to all PJM transmission customers pursuant to a formula developed by PJM and approved by the FERC. Id. at 21.

PJM's RTEP is an annual process that undertakes a comprehensive analysis to ensure compliance with all NERC reliability standards.[34] This process includes planning reliability criteria developed by PJM and its transmission owners to supplement the FERC-approved NERC reliability standards. These planning criteria are used by PJM to analyze the transmission system and to determine the specific transmission projects that are needed to ensure reliable electric service, which projects are then identified during the RTEP process. Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 11-13; Exhibit P-11 (Direct Testimony of Steven R. Herling) at 14-15; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 5-9.

The RTEP integrates numerous factors, including:

- Forecasted load growth, demand-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 and to ensure adequate allocation and funding of long-term financial transmission rights;[35]
- Assessments of the potential risk of aging infrastructure;

[34] PJM's RTEP process is currently set forth in Schedule 6 of the PJM Operating Agreement ("Schedule 6"). Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 13. Schedule 6 governs the process by which PJM's members rely on PJM to prepare an annual regional plan for the enhancement and expansion of the transmission facilities to ensure long term electric service reliability consistent with established reliability criteria. Id. In addition, Section 6 addresses the procedures used to develop the RTEP, the review and approval process for the RTEP, the obligation of transmission owners to build transmission upgrades included in the RTEP, and the process by which interregional transmission upgrades will be developed. Id. See also Exhibit P-11 (Direct Testimony of Steven R. Herling) at 14-14 to 16-22.

[35] Even though the RTEP process considers congestion, it is important to note that the Project is intended only to address reliability issues and is not being proposed for economic reasons. 3T:699-14 to 700-1; 3T:765-5 to 765-13; 3T:766-2 to 766-9.

- Long-term firm transmission service requests;
- Generation retirements and other deactivations;
- Transmission owner initiated improvements; and
- Load serving entity capacity plans.

Exhibit P-11 (Direct Testimony of Steven R. Herling) at 15-16.

PJM's RTEP process includes both five-year and fifteen-year planning horizons. The five-year planning process enables PJM to assess and recommend transmission upgrades to meet forecasted load growth and the interconnection of new generation and merchant transmission projects. PJM performs a detailed five-year baseline analysis to assess compliance with reliability criteria and identifies transmission upgrades needed to meet customer demand growth. PJM also evaluates the needs of the system out to fifteen years. The purpose of this longer-term analysis is to identify developing trends that will require longer lead-time solutions and examine the long-term reliability impacts of economic growth and assumptions about generation resources. 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. In this way, "backbone" transmission facilities can be considered in a timeframe that will help ensure that such projects can be identified and completed before reliability violations occur. In addition, mandatory reliability standards established by NERC require that PJM conduct transmission system performance evaluations annually for both near-term (Years 1 through 5) and longer-term (Years 6 through 10) planning horizons.[36]

[36] Exhibit P-11 (Direct Testimony of Steven R. Herling) at 19-3 to 19-12; 26-19 to 26-21. See also NERC Standard TPL-001-0, R1.1 and R1.2.

The PJM RTEP process is initiated each year by developing a power flow case for the current year plus five years out. Included in this model are PJM's expectations for future system conditions that are based upon a number of assumptions, including load forecast, generation additions and retirements, including renewable resources, cleared DR and EE, changes to planned baseline upgrades, firm power transactions and merchant transmission. Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 4, 7; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 4-5; 3T:613-17 to 613-25; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 3-13 to 4-12.[37] In this context**,** PJM includes generation once the generator executes an Interconnection Service Agreement ("ISA") in order to have reasonable certainty that new generation will be available during the planning period. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 38-39; 3T:738-8 to 739-1; 3T:748-1 to 748-9. Similarly, PJM includes DR and EE when it is bid into and cleared through the Reliability Pricing Model ("RPM") capacity auction as available capacity so that it is a viable committed source to reduce demand under emergency peak load conditions. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 32-42; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 9-10; 3T:601-8 to 19; 3T:668-23 to 669-5; 3T:712-24 to 713-8; 3T:727-2 to 727-16.

**e. The RTEP Analysis Incorporates A Load Deliverability Test and A Generation Deliverability Test to Verify Reliability and Assess the System's Compliance With NERC Planning Criteria.**

[37] The potential for reduced electricity usage as a result of such things as DR and EE, which may reduce locational marginal prices ("LMPs") and revenue streams to generators, resulting in additional generation retirements or completion of less new generation, must also be factored into the analysis. Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 4; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 8-10; 3T:723-11 to 723-17.

After developing the base power flow case, PJM conducts a series of studies to test the system for compliance with NERC and other applicable reliability standards. PJM applies two primary tests that define the required critical system conditions: a load deliverability test and a generation deliverability test. The load deliverability test analyzes whether there is sufficient transmission to deliver generation to a load area that is generation deficient, while the generation deliverability test analyzes whether there exists bottled generation that cannot be delivered across PJM due to transmission constraints. Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 7-11 to 9-6. *See generally* 3T:603-3 to 610-14.

As discussed in detail by Mr. McGlynn, to maintain reliability, capacity resources must contribute to the deliverability of energy within PJM in two ways. First, within an area experiencing a localized capacity emergency or deficiency, energy must be deliverable from the aggregate of the available capacity resources in the rest of PJM to the generation deficient area. In addition, capacity resources within a given electrical area must, in aggregate, be able to be exported to other areas of the PJM region. The load deliverability test and generator deliverability test are used to verify compliance with these requirements. Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 7-11 to 9-6; Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 12.

The load deliverability test examines defined load zones within the PJM region and considers the ability of the transmission system to deliver adequate power to the load zone during a generation capacity emergency. The area under analysis is tested at emergency peak load conditions (*i.e.*, 90/10 peak load forecast) with all other areas in PJM set at 50/50 load levels (*i.e.*, normal peak day conditions). PJM then tests the

system under various contingency conditions to determine the ability of the system to meet peak load conditions in the area being studied.[38] Id.; 3T:607-14 to 608-3.

The generator deliverability test evaluates the capability of the transmission system to assure that capacity resources can be delivered to the remainder of the PJM system at peak load. Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 7-11 to 9-6. For the generation deliverability test, PJM uses a 50/50 peak load forecast in all areas. 3T:664-13 to 664-17. PJM then reduces available generation across the system and tests the ability of a particular area to export all of its generation to ensure there is no bottled generation in the PJM system. Specifically, the generator deliverability test examines whether the transmission system is robust enough to export additional generation to the areas requiring it. Id.; 3T:664-13 to 664-17.

The deliverability tests establish a link between generation resource adequacy for the region and the transmission adequacy necessary to deliver the generation resources to loads. Both types of studies are conducted by simulating the transmission system as it is expected to exist during future time periods. The simulations include expected load growth (for the load deliverability test this includes the anticipated benefits of demand side management and conservation activities), the addition of new generating plants and the retirement of existing generation plants, and planned transmission construction projects. Id. The simulations also assume that imports of energy into the region are optimized. 3T:704-11 to 704-24.

[38] Even though the area under analysis is tested at a 90/10 peak load forecast, which is already characterized as an "emergency" condition, it must be understood that the system must be designed to deal with "much higher than 90-10 loads," as occurred in 2006. 3T:608-25 to 609-4.

PJM applies the load deliverability and generator deliverability testing procedures to determine compliance with the NERC reliability standards. As explained above, the NERC criteria at issue in this proceeding fall into three Categories: A, B, and C. NERC Category A criteria require that, with all facilities in service, equipment thermal ratings and system voltage limits are respected and that the system is stable. Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 6-6 to 6-8. To test for NERC Category A criteria violations, PJM evaluates the system with no contingencies. That is, all facilities on the system are fully operational. For NERC Category A load deliverability tests, PJM assumes a 90/10 projected peak load for the zone or broader area being tested and a 50/50 projected peak load for the remainder of the system. 3T:607-14 to 608-3. For the generator deliverability test**,** PJM uses the 50/50 projected peak for the entire system. 3T:664-13 to 664-17.

NERC Category B requires that the system be evaluated with one facility removed from service, *i.e.*, a transmission line, transformer or generator. This is referred to as the "n minus 1" or "n-1" criteria. This requires PJM to complete thousands of power flow studies to determine the impact of the removal from service of each of the individual facilities on its system. The NERC Category B criteria ensure that the system continues to remain reliable upon the instantaneous outage of a generator or transmission system element. Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 6. For NERC Category B load deliverability tests, PJM assumes a 90/10 projected peak load for the area being tested and a 50/50 projected peak load for the remainder of the system. 3T:607-14 to 608-3. For the generator deliverability test, PJM uses the 50/50 projected peak for the entire system. 3T:664-13 to 664-17.

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, *i.e.*, with two elements of the system out of service. For example, such events include the loss of one system element followed by system readjustments, and then the loss of a second system element. This is referred to as the "n minus 1 minus 1" or "n-1-1" criteria. Category C also includes events such as the loss of two circuits on a single tower line, also known as "double circuit tower line contingencies." In this case, PJM assumes damage to an electric structure that takes two lines out of service simultaneously. Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 6-13 to 7-2. Under the testing for these double circuit tower line contingencies, no system readjustments are permitted because both lines are removed from service at the same time. *Id*. at 6-7.[39] For Category C violations, PJM uses only a 50/50 peak demand forecast and not a 90/10 peak demand forecast, reflecting the fact that Category C events are less likely to occur than Category B events. 3T:664-13 to 664-17.

When a potential NERC violation is identified by the planning process outlined above, PJM must develop specific solutions to resolve these violations. To develop solutions, PJM presents the results of its analyses to TEAC to solicit comments and recommendations from all PJM members and any other interested stakeholders. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 11-13. This process elicits potential solutions to the identified violations, including generation-based and demand side management-based proposals, as well as transmission line proposals. *Id*. at 9-23 to 10-11; 36-21 to 39-12. Where the solution requires the construction of new or upgraded

[39] Only the Category C double circuit tower line contingencies are relevant for this proceeding, as all of the identified Category C violations at issue here were double circuit tower line contingencies. Exhibit P-20 (Rebuttal Testimony of Paul F. McGlynn) at 4-6; Exhibit MI-13.

transmission facilities, PJM will direct the relevant transmission owner to undertake the required project. Id. at 21-9 to 21-12; Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 18-10 to 19-15); 3T:699-1 to 700-1.

PJM annually updates the assumptions used in the previous RTEP assessments to account for changes in load forecast, expected generation availability and DR/EE. In addition, PJM may verify the continued need for or modification of past identified RTEP upgrades through "retool" studies. Through these retools, PJM reassesses the current system conditions and makes any necessary adjustments to its prior analyses. Through this process, PJM verifies the continued need for, or determines if there is a need to modify, past recommended upgrades. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 27-2 to 27-20; Exhibit S-103 (PJM Manual 14B) at 13-14.

**f. PJM's RTEP Process Determined the Need For the Project**

Applying the process described above, PJM's 2007 RTEP (Exhibit S-100) identified numerous transmission reliability criteria violations on critical 230 kV circuits in eastern Pennsylvania and northern New Jersey, beginning as early as 2012. Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 21-12 to 21-22 and Exhibit PFM-1 thereto. This analysis was validated and the need for the Project was confirmed through the 2008 RTEP (Exhibit S-101). Id. at 12-17 to 15-8; 22-1 to 23-16. Each of the identified reliability violations results from "overloaded" transmission facilities. In other words, the loading on the transmission facilities was projected to exceed the applicable rating, which could cause permanent damage to transmission infrastructure and widespread power outages. Id. at 18-7 to 19-21.

Thereafter, PJM conducted a further mid-year update of the 2008 RTEP, which analysis has been referred to as the "March 2009 Retool." The TEAC reviewed the March 2009 Retool at its March 13, 2009 meeting. Exhibit P-20 (Rebuttal Testimony of Paul F. McGlynn) at 3-18 to 4-5 and Exhibits PFM-2 and PFM-3 thereto. The March 2009 Retool demonstrated the continued existence of multiple reliability criteria violations. Specifically, the results of the March 2009 Retool included 13 NERC Category B violations and 10 NERC Category C double circuit tower line contingency violations. Multiple violations continued beginning as early as 2012, despite a significant decline in load as a result of the extraordinary economic circumstances of 2008. Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 4-19 to 4-22; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 4-10 to 5-22; Exhibit P-20 (Rebuttal Testimony of Paul F. McGlynn) at 3-1 to 5-15; 4T:813-20 to 814-1. The NERC Category B violations due to single contingency events are set forth in Exhibit PFM-2 to Exhibit P-20 and the NERC Category C violations due to double circuit tower line contingencies are set forth in Exhibit PFM-3 to Exhibit P-20. As discussed further in the Section V.B.2 below, DR resources cannot be relied upon as a planning solution to NERC Category C violations. Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 6; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 6-7; 3T:661-21 to 663-14; 3T:664-6 to 664-9; 3T:709-19 to 710-3; 3T:740-7 to 741-2.

After identifying these violations in 2007, PJM, again in consultation with its members, including PSE&G, identified a number of alternatives to resolve the projected violations. Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 21-17 to 21-18. As a PJM Transmission Owner, PSE&G actively participated in the PJM RTEP process that

led to the selection of the Project and provided PJM with the results of its independent studies of its local reliability plans for consideration and inclusion in the RTEP. Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 16; Exhibit P-11 (Direct Testimony of Steven R. Herling) at 17. PSE&G also provided PJM with several options to resolve the violations, including the Project. 3T:729-21 to 731-21. However, while PSE&G's independent analysis provided further support for the need for the Project, and while PSE&G worked with PJM to develop options to resolve the violations, it was PJM, not PSE&G, that identified the need for the Project and PJM that ultimately selected the Project. Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 16, 21; Exhibit P-11 (Direct Testimony of Steven R. Herling) at 17; Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 3; 3T:699-1 to 700-1; 3T:717-9 to 717-17.

After extensive analysis, PJM and its stakeholders, including PSE&G, narrowed the potential transmission solutions to resolve the reliability problems to the Project and two other alternatives -- the Bossards-Jefferson 500 kV line and the Stanton-Roseland 230 kV line.[40] Exhibit P-11 (Direct Testimony of Steven R. Herling) at 32; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 24; Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 9-10; 3T:700-8 to 700-13. The PJM RTEP process determined that the Bossards–Roseland 500 kV line would provide less relief on the overloaded facilities over the 15-year planning horizon than that provided by the Project. Id. PJM's analysis

[40] The reasons why non-transmission alternatives, such as DR, EE and new generation, cannot be relied on to resolve the reliability problems are addressed in more detail in Section V.B.2 below.

of the Stanton-Roseland alternative determined that it was not a robust enough solution as violations on many of the lines were only resolved for two to three years. Id.[41]

Consideration was also given to installing new conductors so that the overloaded facilities were capable of transporting more power. However, this alternative was dismissed given the number of facilities that would need to be upgraded. Additionally, it was determined that this alternative would not provide a long-term solution to the reliability issues that had been identified. Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 24-1 to 24-23. The evidence in the record also demonstrates that upgrading of lower voltage lines or other existing facilities would not be sufficient to address the widespread violations that need to be addressed here. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 32; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 24; Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 9-10; Exhibit S-51 (response to S-PP-17); Exhibit S-75 (response to SRTT-26); 3T:579-15 to 583-4. Therefore, the scope and magnitude of the violations identified required the robust solution provided by the Project. Id.

Based on the above analyses, PJM concluded that the Project was the preferred alternative to address the identified reliability criteria violations. Moreover, the undisputed testimony in the record reflects that the need for the Project, and the Project's selection as the appropriate mechanism to address that need, was determined through the RTEP process in an open, transparent forum that afforded every opportunity to consider alternative solutions for the Project. The record also clearly establishes that (1) the

[41] The need for a robust transmission system is of particular importance to New Jersey, which is a "net importer" of energy. Exhibit P-1 (Direct Testimony of Esam A.F. Khadr) at 23; 3T:630-10 to 630-11; 4T:903-18 to 904-6.

Project will resolve all of the relevant reliability criteria violations in the region and, in conjunction with other RTEP projects, help maintain reliable service to electricity consumers in PJM as well as in the PSE&G transmission zone; and (2) if the Project is not in-service by 2012, customers will be at greater risk for loss of service. 3T:667-19 to 668-4. Accordingly, ample evidence in the record supports a Board Order approving the Project under N.J.S.A. 40:55D-19 and authorizing PSE&G to proceed with the construction, installation, energizing and operation of the Project, and all facilities appurtenant thereto.

**2. *No evidence exists in the record that refutes or in any way challenges the independent PJM RTEP analyses which identified the need for the Susquehanna-Roseland Project***

In the face of these comprehensive analyses leading to the development of the Project as the appropriate solution to the identified reliability criteria violations, virtually no evidence was presented in the record in this proceeding contesting PJM's assessment of the 23 planning criteria violations identified by the RTEP process, and the resulting need for the Project. In fact, the only testimony that attempts in any way to undermine PJM's assessment comes from the testimony of Dr. Sovacool, as adopted by Mr. Cooper, in which the principal suggestion is that the violations could be addressed through additional DR and EE initiatives and renewable resources in the form of distributed generation. Testimony of Benjamin K. Sovacool ("Sovacool Testimony") at 9-10, 13-16, 19-22. Even before addressing the substance of this testimony, however, it is important to note that neither Dr. Sovacool nor Mr. Cooper has ever worked for or consulted with an electric utility or transmission owner (4T:879-1 to 19), nor has either been involved in the operation or management of an electric transmission or distribution system or had

primary responsibility for planning or designing a high voltage transmission line or been responsible for the reliable operation of a bulk transmission system or worked for an organization, such as NERC, responsible for the reliability of a bulk transmission system (4T:882-14 to 883-7). Indeed, neither has performed any transmission planning studies nor used any transmission planning programs or tools (4T:934-4 to 935-16; Exhibits Exelon-2, 3 (responses to PSEG-Sovacool-1, 2)). Instead, they approach these issues from a largely theoretical perspective, as researchers, authors, academics or strategic information analysts (4T:878-8 to 10, 19-20), apparently influenced by a perception that traditional utility infrastructure can, to a very significant degree, be scrapped or curtailed and replaced by DR, EE and renewable resources. See, e.g., Exhibit BKS-49; 4T:888-21 to 890:4; 4T:904-13 to 904-23.[42]

In advancing their view of an electricity grid largely free of traditional resources and supported by a reduced level of infrastructure, Dr. Sovacool and Mr. Cooper imply that DR, EE and distributed generation can address the reliability criteria violations identified in the RTEP process and obviate the need for the Project. However, they provide no analysis supporting that proposition. To the contrary, they simply posit a world in which a sufficient amount of these resources will somehow become available at the right time and in the right locations, and on a sustainable basis, so as to address the identified reliability criteria violations. About the only specific example they can conjure is a vague description of the supposed use or investigation by a California utility in the

[42] Due to the fact that Dr. Sovacool's unavailability resulted in Mr. Cooper appearing at the hearing and adopting Dr. Sovacool's testimony, at times it was unclear to what extent Mr. Cooper was responding for himself and to what extent he was responding for both of them (4T:870-5 to 871-21; 879-20 to 881-17). However, based on the tenor of the colloquy and in light of Dr. Sovacool's background (Sovacool Testimony at 1-2), it seems fair to assume that the data responses referred to in the text of this brief and during cross-examination applied to both Dr. Sovacool and Mr. Cooper.

early 1990s – i.e. almost 19 years ago - of distributed generation and/or solar facilities as a substitute for additional investments in transmission infrastructure. Sovacool Testimony at 21. However, as explained by Mr. Khadr, the example did not involve a backbone 500 kV line and is presented without context or detail. In any event, it is clear that solar has not forestalled the development of numerous and significant transmission projects in California. Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 7-18 to 8-13; Exhibit EAK-10 (California ISO Transmission Plan). Even if there were otherwise any relevance to this example, it is essentially meaningless in the context of the Project because, among other things, PJM does not have the authority to require the installation of new generation in general and certainly not at specific locations. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 34-36; 3T:672-1 to 3; 4T:794-17 to 22.[43]

What Dr. Sovacool and Mr. Cooper ignore is that the RTEP process fully takes into account DR, EE and distributed generation to the extent appropriate in developing the baseline analysis of system conditions used for the RTEP. The 23 planning criteria violations that have been identified in the most recent analysis (i.e. the March 2009 Retool) remain ***after*** the impact of DR, EE and distributed generation has been factored into the analysis. However, 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 only the DR, EE and other resources that have been firmly committed through the RPM process, or through the execution of an ISA with respect to generation resources, to ensure that such resources are actually in place at the time

[43] For its part, PSE&G, has been a leader in the State of New Jersey with respect to helping to promote renewable energy generation development through both Board-approved solar loan programs (Docket Nos. EO07040278 and EO09030249) and the installation of 80 MW of new solar generation in its New Jersey service territory (Docket No. EO09020125; Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 8). See also Petition at 3-4, ¶6.

needed. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 32-42; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 9-10; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 7-8; 3T:601-8 to 19; 3T:668-23 to 669-5; 3T:712-24 to 713-8; 3T:727-2 to 727-16.

With respect to generation in particular, only projects that have signed an ISA can be taken into account in the RTEP process. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 38-41. It would be imprudent to assume that proposed generation will in fact be built and available to address the criteria violations prior to that step, primarily because so few generation projects have been developed in New Jersey and the overwhelming majority (85%-88%) of projects that enter the interconnection queue are ultimately abandoned and never placed into service. Id.; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 7; 3T:596-4 to 597-1. Moreover, strict environmental restrictions and increasingly contentious local opposition will continue to complicate the development of new generation sources. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 32-33.

Indeed, while New Jersey's own EMP, which was attached to Dr. Sovacool's testimony as Exhibit BKS-46, has been formulated based on the achievement of significant goals for DR and EE -- goals that the EMP itself recognizes are "aggressive" and "experimental and largely untested on a substantial scale" (EMP (Exhibit BKS-46) at 6, 67) – the EMP also clearly acknowledges that these tools cannot replace traditional generation resources and utility infrastructure, including, in particular, new transmission lines.[44] Id. at 7, 27, 51, 75. In fact, the EMP modeling assumes that RTEP transmission

[44] The EMP had no choice but to assume that such traditional resources will continue to be developed because, among other things, the EMP's energy usage and peak demand goals reflect reductions not from

projects generally and this Project, in particular, will be built, even while also modeling achievement of its own aggressive, experimental and untested DR/EE goals. Moreover, Dr. Sovacool and Mr. Cooper ignore the fact that the EMP goals are for 2020, while the Project has to be in service by June 1, 2012. Exhibit EAK-8 (EMP Modeling) at 15 and Appendix A thereto at 40 and 65.

PJM does not have the luxury of assuming that well-intentioned but admittedly "aggressive," "experimental" and "untested" goals for DR, EE and distributed generation, such as those contained in the EMP, will simply materialize in the absence of firm commitments, because the consequences of being wrong -- brownouts, load shedding or even more catastrophic blackouts -- could be devastating to the affected population and to the economy.[45] 4T:851-20 to 852-16. DR, EE and distributed generation simply cannot be relied upon to resolve so many criteria violations, particularly in the relatively short time frames at issue here.[46]

Dr. Sovacool and Mr. Cooper have also criticized PSE&G and PJM for not analyzing how much DR or EE would be needed to resolve the 23 criteria violations and obviate the need for the Project.[47] 4T:932-3 to 934-3. Board Staff, too, has made

---

current usage, but instead from projected usage under a "business as usual" scenario, with the result that even if these goals are achieved, the demands on the electricity grid will nonetheless continue to increase. EMP (Exhibit BKS-46) at 6-7, 10-13.

[45] Even Mr. Cooper acknowledges the importance of maintaining a reliable transmission system (4T:896-12 to 16) and the potentially "catastrophic" consequences of blackouts (4T:896-25 to 897-2).

[46] This fundamental point is reinforced by one of the papers to which Dr. Sovacool contributed, *Alternatives to the Indian Point Energy Center for Meeting New York Electric Power Needs* (Exhibit BKS-31). Under "Summary and Findings," even Dr. Sovacool's own paper recognizes, among other things, the significance of the "stability of the transmission-distribution system", that replacement of the Indian Point generating station would most likely consist of a portfolio of approaches including investments in transmission, and that there is less confidence "that the necessary political, regulatory, financial, and institutional mechanisms are in place to facilitate the timely implementation," over "many obstacles," of DR, EE and the other resources that would be needed in addition to new transmission to replace Indian Point.

[47] Interestingly, Dr. Sovacool and Mr. Cooper also did not undertake any such analysis. 4T:930-12 to 934-3; Exhibit Exelon-1 (response to PSEG-Sovacool-41).

inquiries in this regard. See, e.g., Exhibit S-53 (response to S-PP-25)**;** 4T:803-6 to 10. As noted, the RTEP process fully takes into account all DR, EE and generation that has been sufficiently "committed," which is the only stage at which these resources can be relied upon to address the reliability concerns. Speculative, theoretical analyses of the quantity of DR and EE that might be required do not help to ensure reliability, as 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. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 34-36; 3T:672-1 to 672-3; 4T:794-17 to 794-22. Moreover, such an analysis would be of no practical value in any event without detailed information about the precise location of each such resource. 3T:628-5 to 628-8.

Reliance on possible future DR, in particular, would be a very tenuous foundation on which to base a decision to forego the system reinforcement embodied in the Project and expose the transmission grid (and the customers which it serves) to the potential drastic consequences of the criteria violations identified through the RTEP process. DR is not mandatory and relies on the voluntary actions of individual customers, which can never be assured, particularly on a sustained basis. Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 7-8. Moreover, additional DR (or EE) cannot be viewed in a vacuum as such initiatives if undertaken in sufficient quantity could well reduce LMPs and revenue streams to generators, resulting in additional generation retirements or the completion of less new generation. Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 4; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 8-10; 3T:723-11 to 723-17.

Even putting aside these fundamental reasons for taking into account only more certain, committed DR, it must be recognized that DR will not in any event address the ten (10) Category C double circuit tower line contingency violations identified in Exhibit PFM-3 to Exhibit P-20 (Rebuttal Testimony of Paul F. McGlynn), because (i) these Category C violations are modeled under non-emergency conditions when PJM has no authority to call for DR resources, and (ii) these contingencies occur without warning and require immediate operator reaction to avoid load shedding or more widespread blackouts, leaving no time for the implementation of DR, which requires a longer lead-time, even if such resources were available.[48] Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 6; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 6-7; 3T:661-21 to 663-14; 3T:664-6 to 664-9; 3T:709-19 to 710-3; 3T:740-7 to 741-2. Perhaps just as important is the fact that it is not just the absolute amount of these resources that is significant, but also their precise location. As Mr. Herling made clear, DR installed in, for example, Baltimore, even if one were to assume an extensive deployment beyond anything that has been committed to date and ignore the inability of DR to address Category C violations, will still not address the criteria violations that must be resolved by the Project. 3T:740-20 to 740-23; 3T:742-20 to 742-25.

[48] For essentially the same reasons, there is no merit to the complaints that the results of the May 2009 RPM auction have not yet been formally factored into any RTEP analysis. Mr. Herling has made clear that these results cannot under any circumstances eliminate the identified Category C violations for the reasons discussed in the text and because they are simply not sufficient in any event to address the substantial number of identified violations. 3T:740-11 to 740-20; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 6. Moreover, even if there were some possibility that a subsequent analysis that takes the May 2009 RPM results formally into account would justify a change to the Project or its required in-service date, PJM and PSE&G would abide by that determination. Petition at 14, ¶29; Exhibit P-11 (Direct Testimony of Steven R. Herling) at 27; Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 7; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 4.

The PJM load forecast is a significant element of the RTEP analysis that identified the 23 planning criteria violations underlying the need for the Project.[49] As might be expected, Dr. Sovacool and Mr. Cooper criticize PJM's load forecasting, suggesting, among other things, that it overestimates load growth and therefore overstates the need for the Project. Sovacool Testimony at 3-9. In particular, in disregard of the evidence in the case, they repeatedly argue that PJM has overlooked, or at least failed sufficiently to take into account, the effects of the economic crisis that began in the fall of 2008.[50] Id. at 5-7. However, in advancing these arguments, Dr. Sovacool and Mr. Cooper ignore the fact that PJM's March 2009 Retool occurred well after the onset of the economic crisis. Indeed, Mr. Reynolds made clear at the hearing that:

> [S]tarting with the load forecast report which was released in January 2009 [and used in the March 2009 Retool] [the forecast] did fully reflect the impact of a recession that began in 2008, deepened in 2009 . . . and reflected the largest load drop that anyone at PJM has ever seen and that analysis . . . was used to confirm the need for the Susquehanna-Roseland line . . . .

4T:813-20 to 814-1. The fundamental point is that the March 2009 Retool, which reflected the effects of the economic crisis and factored in the "largest load drop that anyone at PJM has ever seen," still identified 23 planning criteria violations and confirmed the need for the Project. Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 4; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 5; Exhibit P-20 (Rebuttal Testimony of Paul F. McGlynn) at 3-4.

---

[49] Of course, many other elements also go into the analysis, such as generation additions and retirements, cleared DR/EE, changes to planned baseline upgrades, firm power transactions and merchant transmission. Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 4, 7; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 4-5.

[50] Even Dr. Sovacool and Mr. Cooper, however, can go no further than to speculate that the acknowledged recent drop in electricity demand "may" be indicative of a permanent shift in consumption (Sovacool Testimony at 7). By itself, this unsubstantiated and indefinite opinion can hardly be considered a basis for a decision to leave the identified violations unaddressed.

Much has also been made of the fact that the resulting decline in the load forecast has resulted in the delay or, in one case, cancellation of a portion, of other RTEP projects. Sovacool Testimony at 6, 12. Of course, as Messrs. Khadr and Herling testified (Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 5; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 3-4), this only demonstrates the *bona fides* of the RTEP process, as those actions demonstrate the validity of PJM's assurances that when subsequent analyses demonstrate that a project can safely be delayed, or is no longer needed, that conclusion is recognized. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 27; Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 7; Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 4. Moreover, the very same reduced load forecast that caused delay and/or cancellation of other RTEP projects continues to demonstrate a need for the Project, as evidenced by the 23 criteria violations identified in the March 2009 Retool.

Other attempts to cast aspersions on the RTEP process are either conclusory assertions that are advanced without any analytical support whatsoever or have been fully addressed by the testimony of the PJM and PSE&G witnesses in the case. For example, the attempts to muddy the waters about the general accuracy of PJM's load forecasting (Sovacool Testimony at 3, 8-9) have been fully refuted in the rebuttal testimony of Messrs. Herling and Reynolds, who explain that this criticism ignores the fundamental distinction between normalized (*i.e.*, weather adjusted) and unrestricted (*i.e.*, highly temperature dependent) load. Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 2; Exhibit P-21 (Rebuttal Testimony of John M. Reynolds) at 2-3. When apples are compared to apples, the forecasts are within a "very acceptable margin of error" (Exhibit

P-21 (Rebuttal Testimony of John M. Reynolds) at 2:9-10), as The Brattle Group acknowledged (*id*. at 2). Similarly, attempts to characterize the violations at issue as "small" or limited (3T:623-4 to 626-12) fail to recognize that NERC requires ***all*** violations to be resolved regardless of their magnitude (4T:851-2 to 851-9).

Dr. Sovacool and Mr. Cooper also allege that "PJM's planning process [is skewed] toward the overbuilding of transmission capacity" (Sovacool Testimony at 33-7), but fail to explain what exactly is meant by that allegation or to otherwise support it (beyond their complaint about how new generation is modeled). As to the modeling of new generation, Mr. Herling explained that, because of the overarching need to ensure the ongoing reliability of the transmission grid, PJM must take a conservative approach to modeling new generation. Thus, a generator's contribution to increased loading on transmission facilities must be considered when it is proposed, even though it cannot be viewed as part of a planning solution until it clears an RPM auction or signs an ISA. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 38-41. Moreover, Dr. Sovacool's and Mr. Cooper's assertion ignores the fact that the RTEP process identifying the need for the Project fully considered, to the extent appropriate, DR, EE, smart grid concepts and new generation as well as alternatives to the Project such as reconductoring and lower voltage transmission lines, all of which were found inadequate under the circumstances presented. Exhibit P-11 (Direct Testimony of Steven R. Herling) at 32-35; Exhibit P-12 (Direct Testimony of Paul F. McGlynn) at 24; Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 9-10; Exhibit S-51 (response to S-PP-17); Exhibit S-75 (response to SRTT-26); 3T:579-15 to 583-4; 3T:592-13 to 592-22. The fact that the analysis ultimately determined that the Project was the optimum solution for addressing

all of the projected violations does not mean that the process was "skewed" in that direction. It was simply the fully-supported result of an unbiased and thorough analytical process.

As in other areas, Dr. Sovacool's and Mr. Cooper's discussions of reactive power and the like (Sovacool Testimony at 23-29) also fail to take into account the testimony of PJM and/or PSE&G witnesses who address these matters, in this case primarily PSE&G witness Esam Khadr. Mr. Khadr concurs that reactive power issues are of great significance, but makes clear that, contrary to the unsubstantiated opinions of Dr. Sovacool and Mr. Cooper (who are not engineers and have never operated or planned a transmission system), the Project will, in fact, reduce the need for reactive power. At the same time, the Project will add charging to the system, as would a capacitor, thereby increasing reactive power and contributing to voltage stability, with the result that the transmission network will be strengthened and reliability enhanced. Item Exhibit P-15 (Rebuttal Testimony of Esam A.F. Khadr) at 8-9; 3T:622-16 to 622-20; 3T:672-20 to 673-14. Moreover, it is significant to note that, contrary to Dr. Sovacool's argument that 500 kV projects cause reactive problems, in fact, they solve them. Exhibit S-101 (2008 RTEP -- Reliability Analysis Updated, dated October 15, 2008 (TEAC meeting) at 2) notes the severe reactive problems identified for MAAC and EMAAC load deliverability in 2013, and that all 3 alternatives identified to address those issues were 500 kV backbone projects. In any event, none of the planning violations at issue here relate to reactive power or involve voltage stability issues. 3T:678-23 to 678-25; 3T:687-6 to 687-8.

In a similar vein, Dr. Sovacool's and Mr. Cooper's unfounded allegations that the RTEP process' deliverability tests somehow violate NERC rules by failing sufficiently to take into account DR and EE (Sovacool Testimony at 29-32) is based on the circular reasoning that this must be the case if the process results in a finding that DR and EE cannot resolve the projected criteria violations and that a new transmission line is required. As explained above, though, the RTEP process fully considers DR and EE to the extent deemed prudent in light of the overriding reliability concerns at stake. The fact that this process ultimately supports construction of the Project cannot mean, simply by virtue of that result, that it violates NERC rules.

In another attempt to weaken the overwhelming weight of the evidence in the record demonstrating analytical support for the Project, Dr. Sovacool and Mr. Cooper construct a classic strawman as they expend several pages of testimony extolling the virtues of DR and EE.[51] Sovacool Testimony at 14-20. However, no one disputes the virtues of DR and EE. To the contrary, PJM and PSE&G are supportive of these initiatives. Exhibit P-19 (Rebuttal Testimony of Steven R. Herling) at 10-11; Petition at 3-4, ¶6; 3T:723-23 to 724-7. The point is not that there is opposition to these approaches in the abstract, which there is not. Rather, the point is that, as discussed above, the transmission system would be in jeopardy for catastrophic failures if the Project were not to go forward in reliance on wishful thinking about substantial, indeed unprecedented,

[51] While extolling the virtues of DR and EE, Dr. Sovacool also takes the opportunity to proffer baseless assertions about PSE&G's supposed "underinvestment" in EE (Sovacool Testimony at 17), or failure to "seriously consider[]" DR (Id. at 19), refusing to recognize PSE&G's leading role in New Jersey with respect to these initiatives. See approved PSE&G programs in Docket Nos. EO08060426 (carbon abatement), EO08080544 (demand response) and EO09010061 (energy efficiency). While similar criticisms were voiced about PSE&G's supposed failure to consider solar development (Id. at 22), at the hearing Mr. Cooper did not seem to be arguing that solar could, in fact, displace the Project, but, instead, seemed merely to feel that PSE&G should have stated explicitly that it was considering solar as an "alternative" to the Project, however unrealistic that may be, which was their "only use of solar" (4T:951-3 to 951-13). See also the discussion of PSE&G's solar programs in footnote 43 above.

further development of these resources with no assurance that they will come to pass on a timely, sustained basis and in the required locations to resolve the identified criteria violations. It is not inconsistent to take a strong stand in favor of further development of DR, EE and renewable generation while at the same time approaching critical transmission planning somewhat more conservatively.

In summary, the record is devoid of any credible evidence that in any way could be found to support a conclusion that the Project is not needed to maintain reliable electric service. Accordingly, consistent with the incontrovertible evidence supporting the need for the Project, the Board should grant the relief requested by PSE&G.

## C. ROUTE SELECTION, ENGINEERING AND CONSTRUCTION

### *1. The uncontested engineering expert testimony in the record supports a conclusion that PSE&G determined the most appropriate route for the Project that, to the greatest extent possible, minimizes impacts to the public*.

As discussed above, ample evidence in the record supports a conclusion pursuant to N.J.S.A. 40:55D-19 that this Project is reasonably necessary for the service, convenience or welfare of the public. Having satisfied this threshold, the only remaining regulatory analysis concerns the actual route selection, engineering and construction. Pursuant to N.J.S.A. 40:55D-19, the BPU has the power and the duty to consider the suitability of the route of the Project. Monmouth Water, supra, 47 N.J. at 259. The Appellate Division reaffirmed this position in 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, 22 (App. Div. 1968) ("Public Service II"), stating that the BPU retains general supervisory control of all aspects of a project on a broad basis.

After reviewing the evidentiary record in this matter, it is clear that the uncontested expert testimony supports the conclusion that PSE&G has chosen the most appropriate route and has taken reasonable steps to minimize the impacts to the public. Therefore, pursuant to N.J.S.A. 40:55D-19, the BPU should find that this Project is reasonably necessary for the service, convenience, or welfare of the public.

**a. PSE&G Has Chosen the Most Appropriate Route**

Pursuant to N.J.A.C. 14:5-7.1(a)(1), "whenever an [electric delivery company] constructs an overhead transmission line, it shall make use of available railroad or other rights-of-way whenever practicable, feasible and with safety, subject to agreement with the owners." These were exactly the facts in In the Matter of Application of Jersey Central Power & Light Company for a Determination Pursuant to N.J.S.A. 40:55D-19, 92 N.J.A.R.2d 43 (1991) ("Jersey Central"). In that case, JCP&L filed a request under N.J.S.A. 40:55D-19 to construct a 34.5kV line through several municipalities in Morris County. Id. at 1. At a hearing at the Office of Administrative Law, JCP&L testified that the route would use an existing JCP&L and New Jersey Transit right-of-way for the entire route. Id. at 4. Based on the testimony set forth by the expert witnesses, the Board determined that the location of the line was compatible with the public interest. Id. at 9.

Similarly, in Public Service II, the Appellate Division ruled that the BPU had acted reasonably in granting PSE&G the right to condemn property for a new 500kV transmission line after the BPU reviewed the route selection process and determined that PSE&G was selecting the most appropriate route for the new transmission line. Id. at 16. Although the decision in that case involved the authority to condemn the right-of-way, the Appellate Division stated that the standards for determining whether the BPU acted

appropriately in granting condemnation authority are identical to those applicable to decisions under the predecessor to N.J.S.A. 40:55D-19. Id. at 15.

In Public Service II, the Appellate Division summarized PSE&G's efforts associated with route selection as follows:

> Public Service initiated its planning of the Holland-Branchburg leg of the right-of-way in 1962. The record establishes that it laid out the route of the transmission line after examination of area photographs, geodetic maps and land surveys. It considered the use of an existing right-of-way of the New Jersey Power & Light Company and the acquisition of additional width to form the 200-foot strip deemed necessary for the facilities. However, negotiations were unsuccessful in this direction because New Jersey Power & Light Company intends to make use of its right-of-way in the near future. Ultimately Public Service determined to parallel an existing right-of-way of that company in order to use a common corridor and cause a minimum severance of properties. Deviations were necessary in some instances in order not to interfere unduly with buildings and other improvements.
>
> There was evidence that it considered and examined at least six routes through Hunterdon County before reaching the final decision as to the location of this route which is about 22.8 miles in length.

Id. at 14. In upholding the BPU's approval, the Appellate Division stated, "our review of the record in this case satisfies us that the Board, in arriving at its determination, did take into consideration all of the pertinent factors, including the impact of the proposed project on the community." Id.

In the present case, the incontrovertible testimony of PSE&G's routing expert, Jack Halpern, Project Director for the Louis Berger Group, establishes that PSE&G selected the most appropriate route for this Project. Exhibit P-8 (Direct Testimony of Jack Halpern) at 11-18 to 11-21. In fact, the evidence shows that PSE&G conducted a thorough routing analysis. PSE&G retained the services of the Louis Berger Group to develop and evaluate routing alternatives for the New Jersey segment of the Project. Id.

at 3-20 to 3-21. After more than six months of analysis, Berger issued an Alternative Route Investigation Report dated August 5, 2008 ("ARI"), which was attached to Mr. Halpern's Direct Testimony (Exhibit P-8) as Exhibit JH-1. As part of the investigation and analysis of the ARI, Berger applied a rigorous and systematic approach to the assessment of available alternatives and, using a number of factors (including public feedback), identified the best route for the New Jersey Segment. Id. at 8-15 to 8-18.

Potential Routes, as defined in the ARI, were first identified and studied by the routing team. *Id.* at 8-19. Where the routes intersected, *Links* were formed as the segment of the route between intersections. *Links* changed as the study progressed and new *Links* were added or deleted. Eventually, the better L*inks* were assembled into the best routes for quantitative analysis. A series of alternative routes were developed from the potential route network by the routing team. Section 2.9 (Identification of Alternative Routes) of the ARI presents details of the alternatives identified as well as a map of the possible alternatives. Id. at 8-19 to 9-3.

After selecting alternative routes, Berger analyzed potential impacts of the alternative routes including the study of Geology and Soils, Surface Water Resources and Aquatic Species/Habitats, Wetlands, Vegetation, Wildlife and Sensitive Species, Land Use, Recreation Lands and Designated Natural Scenic Resources, Cultural Resources, and Aesthetics. The ARI thoroughly explains the process as follows:

> The benefits and disadvantages of the re-aligned Potential Routes were assessed by the Routing Team based on the routing criteria developed, an inventory of land use and environmental factors along each of the routes, and the knowledge and experience of the Routing Team members. Less favorable Potential Routes were dismissed and potential viable Alternative Routes were retained for further consideration. The Alternative Route identification process was conducted in consultation with PPL to ensure that alignments that cross from Pennsylvania to New Jersey cross the

> Delaware River at compatible locations. The routing teams from PSE&G and PPL then assessed the remaining Potential Routes from an environmental and engineering perspective and selected three Alternative Routes for detailed consideration as the Preferred Route (Alternatives A, B, and C). Additional field reviews were conducted to verify conditions at known sensitive locations, meetings with resource agencies, municipalities, and the public were held to gather input on each of the three Alternative Routes, and refined environmental inventory data was reviewed. In discussions during various public meetings, it was evident that people were concerned about the effects of construction on resources of importance to the local community, as well as property values, public health, and aesthetics. The Preferred Route selection process took these concerns into consideration by attempting to maximize the distance of the centerline from residences and other sensitive resources such as schools and churches when not following existing rights-of-way. This process has led to the selection of the Preferred Route.

Exhibit JH-1 at 1.

On August 5, 2009, after a thorough analysis involving public input, PSE&G announced that the Preferred Route would be Route B of the ARI. Exhibit P-8 (Direct Testimony of Jack Halpern) at 8-1. Route B follows PSE&G's existing Roseland-Bushkill transmission line right-of-way which has been impacted by existing utility structures since at least 1930. Id. at 10-19 and Exhibit P-5 (Direct testimony of Richard Crouch), at 4-19 to 5-6. When analyzing Route B against all other potential routes, Berger determined that Route B was the most appropriate route because Route B:

- Impacts the least forested land on the right-of-way (0.3 miles).
- Impacts the least amount of forested wetland on the right-of-way (0.1 miles), thus minimizing the potential change in wetland functions.
- Impacts the least number of C-1 streams crossed (10) which are not already crossed by an existing 230-kV transmission line on the same alignment.
- Results in essentially no change in the existing land use because the line could be constructed in the existing right-of-way.
- Crosses the Appalachian Trail on an existing 230-kV transmission line right-of-way.

- Impacts the least distance of Highlands Planning Area crossed (9.0 miles).
- Crosses 17.1 miles of Highlands Preservation Area but nearly all on an existing cleared right-of-way.
- Is likely to have the least incremental impact on historic and archaeological resources compared to the other two Alternative Routes because the existing right-of-way would not need to be expanded, and existing structures would be replaced with new, albeit taller, structures, minimizing new ground disturbance.

Exhibit P-8 (Direct Testimony of Jack Halpern) at 9-9 to 10-2.

PSE&G's use of an existing right-of-way comports with the BPU's requirement to use existing right-of-ways where feasible. N.J.A.C. 14:5-7.1. In fact, when asked during cross examination what was the most compelling factor that made Berger recommend Route B, Mr. Halpern testified that it was "the fact that it was an existing right-of-way that had already existed." 1T:221-14 to 221-16. Mr. Halpern further testified that the use of an existing right-of-way minimizes impacts to the natural and human environment. Exhibit P-8 (Direct Testimony of Jack Halpern) at 10-21.

PSE&G's use of the existing right-of-way is also consistent with the BPU's decision in Jersey Central, where the BPU approved the use of an existing right-of-way for a 34.5kV Project. Jersey Central at 9. Furthermore, the use of the existing right-of-way here is even more advantageous than the fact pattern presented in Public Service II, where the BPU approved the right to condemn a right-of-way for a 500kV transmission line that would consist of a **new** right-of-way immediately adjacent to an existing right-of-way for 22.8 miles. Public Service II at 15.

In the present case, no evidence was presented during the evidentiary hearings indicating that any other routes would be more suitable for this Project. The only suggested alternative came in the form of a marked up map from East Hanover

Township, which proposed alteration of only a small portion of the route around East Hanover Township. Exhibit MI-4. However, as explained by Robert Pollock, PSE&G's environmental expert, the alternative set forth in Exhibit MI-4 is not feasible. Mr. Pollock stated:

> The line drawn on that map [Exhibit MI-4] traversed would be new virgin right-of-way which traverses [what] I believe [is] known as the Piece Meadow section of Troy Meadows and met a very large amount of forested wetlands which would have to be removed to accommodate the new right-of-way. In addition, we do know of, in speaking with the state historic preservation office, we do know of several sites of tribal and other Indian remains. In order to submit wetlands application to the DEP, we need to show that we used the best alternative to reduce impacts to forested wetlands than the existing route which currently does not have any forested wetlands on it.

1T:289-7 to 289-21. To which, Mr. Halpern added the following:

> Besides that route, we looked at two or three other routes, possibilities, more on the south side of 280 and found them impractical for several different reasons, including one or two hazardous waste sites that may involve putting towers or foundation at those hazardous waste sites and also an airport that used for emergency access… And also it would have impact on other people, not the same people, but another group of people.

1T:289-22 to 290-7. Finally, when asked specifically whether Exhibit MI-4 presented a viable route, Mr. Halpern stated, "No. I concur for the same reasons that Mr. Pollock said. It's a forested wetland, very fragile." 1T:290-10 to 290-12.

Furthermore, the East Hanover Township proposal depended upon the ability to construct the transmission line along interstate highway property. Yet, the undisputed testimony of Mr. Halpern establishes that use of existing interstate limited access highways is not permitted by the New Jersey Department of Transportation ("NJDOT") for overhead transmission lines. Exhibit P-22 (N.J.A.C. 16:25-1.7). Pursuant to N.J.A.C.

16:25-1.7(b), PSE&G cannot longitudinally occupy the right-of-way of either Interstate 280 or Interstate 80 with this Project. The regulation states, in pertinent part:

> The [NJDOT] has excluded utilities from use and longitudinal occupancy of limited access highway right-of-way. Public utilities will be considered by the Department for permission to longitudinally occupy limited access highway right-of-way when it can be demonstrated to the satisfaction of the Department that extreme cases of need exist, that it can be shown to be in the best public interest and that the safety criteria enumerated in (b)2 below can be met.
>
> 1. The Department will take the following under consideration when evaluating claims of extreme cases of need:
>
> > i. A public utility can demonstrate that alternate locations are not available or cannot be implemented at reasonable cost, as determined by the Department, in consultation with the Federal Highway Administration (FHWA), from the standpoint of providing efficient public utility services in a manner conducive to safety, durability, and economy of maintenance and operations; and
> >
> > * * *
>
> 2. The Department will apply the following safety criteria:
>
> > i. The public utility facility shall be placed underground;
> >
> > * * *
> >
> > and
> >
> > v. After the public utility facility is installed, it will be virtually maintenance free.

Given the above, the incontrovertible testimony clearly evidences that PSE&G's use of the existing right-of-way is the most suitable route for this Project. In fact, the only evidence in the record specifically concerning routing comes from PSE&G's routing expert, Jack Halpern, who testified that PSE&G performed an extensive route selection that took into consideration environmental impacts, public input and other natural resources. Mr. Halpern testified that the use of the existing right-of-way would have the least impact to the natural and human environment and is therefore the most suitable

route. This analysis is similar to analyses previously approved by the BPU. Accordingly, the BPU should approve the route selection performed by PSE&G.

**b. The Project Will Not Impact Property Values**

The selected route for this Project follows an existing 150-foot wide transmission line right-of-way. Exhibit P-5 (Direct Testimony of Richard F. Crouch) at 4-19 to 5-6. The existing 230kV structures that occupy the right-of-way were built between 1926 and 1931. Id. The existing structures range in height from 72.5 feet tall to 187 feet tall and are constructed in the lattice tower design. Id. at 6-3 to 6-5. Other than re-conductoring completed over the years, no changes have been made to the transmission towers. Id. at 5-8 to 5-11.

The indisputable evidence in the record establishes that the construction of the Project on the existing right-of-way will not have any effect on property values. The only testimony provided during the evidentiary hearings on the issue of property values is that of Richard Franklin, PSE&G's Manager of Corporate Properties, who was asked whether he believed the transmission line will have an impact to property values:

> Q. In your opinion will this transmission line have any adverse effect on real estate values or properties within a line-of-sight of the structures?
> A. No, I do not feel it will.
> Q. What is the basis for that opinion?
> A. The right-of-way is an existing right-of-way, it's been there, all of the properties have existed, the line pre-exists most of the homes that were built so I feel it will not have an adverse impact on the properties.

1T:43-19 to 44-4. Furthermore, Exhibit S-6 (response to S-ENR-32) specifically addresses whether this Project would affect property values, stating:

> Construction of the proposed Project will have no impact to real estate values of the properties adjacent to the right-of-way (the "ROW") as construction will be completed solely within the existing ROW which has been designated for public utility use since 1927. A review of historical

> aerial maps (see www.historicaerials.com ) evidences the fact that the ROW and PSE&G's facilities located thereon predated virtually all of the currently existing residences neighboring the ROW. Furthermore, in or around 1927, PSE&G acquired the necessary property rights to construct the Project from a majority of the properties on which the ROW traverses and compensated those owners for the use of the ROW at that time. PSE&G will be compensating property owners on those properties on which PSE&G needs additional rights to construct the Project.

Exhibit S-6 (S-ENR-32).

The record is devoid of any evidence which in any way contradicts the evidence presented by PSE&G, which establishes that this Project will not adversely impact property values.

**c. The Project Will Not Impact the Ability of Homeowners to Obtain an FHA Mortgage**

STL sponsored the testimony of Helene Jaros, a real estate professional involved in mortgage financing as well as a resident living along the right-of-way associated with this Project. Testimony of Helene Jaros at 2-2 to 2-10. Ms. Jaros testified on the limited issue of whether a property owner can obtain an FHA mortgage if the property owner has a transmission tower near their home. *Id.* at 2-12 to 2-16. However, Ms. Jaros fails to support the position that this Project will affect the ability of property owners to obtain FHA mortgages. Ms. Jaros failed to include the regulations of the U.S. Department of Housing and Urban Development ("HUD") in her testimony, which regulations clearly limit the restrictions on FHA mortgages to locations where the actual residential structures are within the transmission line easement. Furthermore, Ms. Jaros has never applied for an FHA mortgage nor did she ask PSE&G whether her property falls within the engineering fall distance (which term is defined below) of the nearest transmission tower.

Ms. Jaros alleges that FHA mortgages have restrictions and prohibitions regarding the financing of mortgages where the property includes a transmission line easement. Id. at 2-19 to 2-21. Ms. Jaros further claims that "this issue has affected me. I am not able to get an FHA mortgage . . . This is an issue for my own property and I would have to find a different way to finance other than FHA." Id. at 3-3 to 3-5. Ms. Jaros then quotes the HUD Publication 4150.2, CHG-1, p. 11-12, which states "no dwelling or related property improvement may be located within the engineering (designed) fall distance of any pole or tower." Id. at 4-32.

However, on cross examination, Ms. Jaros admitted that she does not know the engineering fall distance to the proposed transmission structure and has never requested this information from the Company. 5T:996-11 to 996-13. Furthermore, Ms. Jaros stated that she has never seen a letter from PSE&G outlining the engineering fall distance of a transmission structure, including the language from PSE&G's transmission engineer explaining the "engineering fall distance" as:

> a transmission tower, which would fail as a result of excessive loading, would not totally collapse. Members would deform and/or buckle but the structure would essentially remain at its position and not topple as a rigid body.

Exhibit P-24 (Engineering Fall-Distance Letter from PSE&G) and 5T:996-21 to 5T:997-21. In fact, when confronted with this letter, Ms. Jaros admitted:

> I am not an engineer. I wouldn't be able to tell you whether or not that would meet the criteria for FHA mortgages. That would be something that would have to go to the FHA.

5T:997-22 to 997-25.

Finally, Ms. Jaros' interpretation of the FHA policies directly contradicts the HUD's regulations set forth on HUD's website. On cross examination, Ms. Jaros

acknowledged that she has seen the HUD regulations which state that unless a dwelling or related improvement is located within the transmission easement, the FHA appraisal can go forward. 5T:998-9 to 5T-998-12 and Exhibit P-25 (HUD Regulations). The HUD regulations included in Exhibit P-25 provide, in pertinent part:

> The appraiser must indicate whether the dwelling or related property improvements is located within the easement serving a high-voltage transmission line, radio/TV transmission tower, cell phone tower, microwave relay dish or tower, or satellite dish (radio, TV cable, etc).
>
> > **1)** If the dwelling or related property improvement is located within such an easement, the DE 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 in order to waive this requirement.
> >
> > **2)** If the dwelling and related property improvements are located outside the easement, the property is considered eligible and no further action is necessary. The appraiser, however, is instructed to note and comment on the effect on marketability resulting from the proximity to such site hazards and nuisances.

Therefore, it is clear that the testimony on the record indicates that, unless the dwelling or related improvement is located within PSE&G's transmission line easement, a property owner can obtain an FHA mortgage. Even if the "engineering fall distance" standard is the relevant standard, as suggested by Ms. Jaros, PSE&G's engineers have indicated that transmission towers do not topple over, and thus the engineering fall distance is only in the general vicinity of the tower foundation and would not extend to the surrounding properties. Accordingly, there is no merit to the allegations expressed by Ms. Jaros, and the BPU should not be concerned that approval of this Project will prevent property owners along the route of the Project from obtaining FHA mortgages.

**d. EMF**

During the evidentiary proceeding, the BPU heard from three (3) witnesses that addressed the topic of EMF. PSE&G presented the testimony of William H. Bailey, Ph.D. to summarize the state of scientific research to date as to whether there is a connection between health effects and exposure to EMF, and Kyle King to present the values of EMF associated with this Project and how they relate to exposures encountered everyday, such as from appliances. Finally, the Municipal Interveners presented the testimony of Martin Blank, Ph.D., who testified that the BPU should ignore thirty (30) years of research and determine that EMF is a health hazard. Therefore, the credible evidence on the record establishes that EMF should not serve as a justification for failing to approve this Project.

1. PSE&G Witness William H. Bailey, Ph.D. Has Established That There Is No Casual Link Between EMF And Health Effects To Humans Based On The Weight-Of-The Evidence In The Scientific Community

There is no reasonable basis to conclude that EMF associated with the Project will represent a hazard or other interference to members of the public along the right-of-way. The weight of the credible evidence submitted on the record shows that the effects of EMF have been thoroughly studied for over 30 years and the research has not found "consistent or strong evidence of harm to humans". Exhibit P-18 (Rebuttal Testimony of William H. Bailey, Ph.D.) at 4-15 to 4-17. Furthermore, it is clear that there is no reliable scientific basis to conclude that exposure to EMF from the Project will cause or contribute to any adverse health effects in adults and children living adjacent to the right-of-way. Id. at 20-4 to 20-23.

PSE&G presented the testimony of William H. Bailey, Ph.D. addressing the scientific research associated with EMF. Among other agencies, Dr. Bailey is a member

of the International Committee on Electromagnetic Safety and the Bioelectromagnetics Society. Exhibit P-10 (Direct Testimony of William H. Bailey, Ph.D.) at 3-1 to 3-10 He testified that his experience includes:

> Reviewing research for the National Institutes of Health, the National Science Foundation, and other government agencies. Regarding transmission lines specifically, I served on a Scientific Advisory Panel convened by the Minnesota Environmental Quality Board to review health aspects of a high-voltage transmission line. In addition, I served as a consultant on transmission line health and safety issues to the Vermont Department of Public Service, the New York State Department of Environmental Conservation, the staffs of the Maryland Public Service Commission and the Maryland Department of Natural Resources. I also have worked with the National Institute of Occupational Safety and Health, the Oak Ridge National Laboratories, the U.S. Department of Energy, and the Federal Railroad Administration to review and evaluate health issues related to electric and magnetic fields from other sources. I also assisted the U.S. EMF Research and Policy Information Dissemination ("RAPID") Program to evaluate biological and exposure research as part of its overall risk assessment process.
>
> Most recently, I worked with scientists from 10 countries to evaluate possible hazards from exposures to static and extremely low frequency ("ELF") EMF for the International Agency for Research in Cancer ("IARC"), a division of the World Health Organization located in Lyon, France. I also was an invited participant in the workshop convened in March 2006 by the International Committee on Non-Ionizing Radiation Protection ("ICNIRP") to update guidelines for human exposures to alternating current ("AC") EMF.

*Id.* at 3-11 to 4-14. Furthermore, Dr. Bailey has studied and conducted research on EMF for 25 years. Id. at 4-17.

Dr. Bailey believes that, when reviewing literature and other research associated with the effects of EMF, using a "weight-of-the evidence" review is particularly important. He states:

> Every study varies considerably in the quality of its design and the methods that were used to assess exposure and evaluate impacts. Often, the first group of studies in a field of research uses cheaper and quicker

> methods to get initial results and, if further research is suggested, more expensive studies with better methods are carried out. It also may happen that, after a study is completed, the investigators find an error that makes the results carry little weight. Scientists cannot draw valid conclusions from studies presenting data that are incomplete or flawed in their methodology, execution, or interpretation. Therefore, it is critically important to evaluate each study individually and give data from studies with a better quality design more weight in a weight-of-evidence review.

Exhibit P-18 (Rebuttal Testimony of William H. Bailey, Ph.D.) at 19-1 to 19-10. Dr. Bailey also explained that the World Health Organization has performed the most recent "weight of the evidence" analysis of all the various studies completed on EMF. Exhibit P-10 (Direct Testimony of William H. Bailey, Ph.D.) at 15-1 to 15-4. He testified that the World Health Organization has concluded that "there are no substantive health issues related to ELF [extra low frequency] electric fields at levels generally encountered by members of the public." Id. at 15-8 to 15-10. Moreover, "new human, animal, and in vitro studies published since the 2002 IARC Monograph, 2002 do not change the overall classification of ELF as a possible human carcinogen." *Id.* at 15-11 to 15-14. He concluded that based on the weight of the evidence, "scientific evidence does not support the conclusion that power-frequency EMF causes any long-term adverse health effects." Exhibit P-18 (Rebuttal Testimony of William H. Bailey, Ph.D.) at 20-29 to 21-1.

During cross examination, Dr. Bailey was asked directly whether it was his opinion that EMFs do not cause health disturbances. Dr. Bailey stated:

> Electric and magnetic fields like everything else in life at some levels of intensity can have some health effects, at levels higher than even employees of electric utilities might encounter we can observe a direct electrical stimulation on tissues that can be painful or disturbing to neurobiological functions because of induced voltages within the body that are sufficiently high so that they interfere with the electrical functions of tissues in the body. And those levels we do not encounter in our everyday environment, so at lower levels we have looked for potential

> adverse effects and have not found a confirmed body of evidence that supports the idea that at the levels below that there are adverse effects.

5T:1077-17 to 1078-9. Dr. Bailey added that it would take EMF at levels of 430,000 mG to produce painful stimulation. 5T:1079-5 to 1079-8. Finally, when cross-examined about an alleged "cancer cluster" in the Township of East Hanover, Dr, Bailey stated that "based on the scientific evidence that I have reviewed there is not a basis to predict that such cancer clusters would be causally related to transmission lines." 5T:1082-18 to 1082-21.

Dr. Bailey also testified that several international health agencies have issued guidelines for exposure to EMF. P-10 (Direct Testimony of William H. Bailey, Ph.D) at 18-21. The International Committee on Non-Ionizing Radiation Protection ("ICNIRP") recommends a screening level of 833mG for the public. *Id.* at 18-21 to 18-22. The 27 member countries of the European Union apply the ICNIRP recommendation "to relevant areas where members of the public spend significant time" *Id.* at 8-22 to 9-2. The International Committee on Electromagnetic Safety ("ICES") also recommends limiting magnetic and electric field exposures at high levels because of the risk of acute effects, although their guidelines are higher than ICNIRP's guidelines at 60 Hz. The ICES recommends a residential exposure limit of 9,040 mG. *Id.* at 9-3 to 9-8.

2. <u>PSE&G Witness Kyle G. King Has Established That The Modeled Peak EMF Levels Expected For The Project Are In The Range Of EMF Emitted From Regularly-Used Electrical Appliances.</u>

PSE&G retained Kyle G. King, a consulting electrical engineer, to model the levels of electric and magnetic fields that will be expected to be produced by the Project. In his direct testimony, Mr. King stated:

> The magnetic field from the median current along the Right-of-Way from Bushkill to Montville ranges from 23 mG to 32 mG for the existing 230

> kV line in 2013. After the Project is completed, the expected magnetic field from the median current along the Right-of-Way from Bushkill to Montville will range from 29 mG to 57 mG on the 500 kV circuit side, and 12 mG to 20 mG on the 230 kV circuit side in 2013. The magnetic field from the median current along the Right-of-Way from Montville to Roseland will be approximately 7 mG for the existing 230 kV line in 2013. After the Project is completed, the expected magnetic field from the median current along the Right-of-Way from Montville to Roseland will be approximately 38 mG to 42 mG on the 500 kV circuit side, and 19 mG to 21 mG on the 230 kV circuit side in 2013.

Exhibit P-9 (Direct Testimony of Kyle King) at 9-6 to 9-17.

The levels of EMF associated with this Project are not unusual. They are in the range of EMF levels found in everyday life. Mr. King testified:

> Some typical median values (measured one foot from the appliance) taken from the National Institute of Environmental Health Sciences "EMF Questions and Answers" June 2002 publication include:
>
> Fluorescent Lights – 6 mG
> Electric Pencil Sharpener – 70 mG
> Hair Dryer – 1 mG
> Electric Drill – 30 mG
> Power Saw – 40 mG
> Air Conditioner – 3 mG
> Electric Range – 8 mG
> Vacuum Cleaner – 60 mG
> Portable Heater – 20 mG
>
> Typical levels of magnetic field in New York City Metro-North Commuter Railroad cars range from 40 to 60 mG, and increase to 90 to 145 mG during acceleration. The earth has a static magnetic field of approximately 570 mG over its entire surface. The earth's field at any position is constant in both magnitude and direction as opposed to the constantly changing power frequency magnetic fields discussed in this testimony.

Id. at 5-1 to 5-17.

Moreover, PSE&G has taken reasonable and prudent steps to minimize the levels of magnetic fields. Id. at 6-2 to 6-17. By constructing the Project on an existing right-of-way, PSE&G is limiting the exposure to the public. Id. Dr. Bailey stated on cross

examination "the construction of a transmission line on an existing right-of-way as opposed to a new right-of-way has the effect of limiting geographic spread of sources in an area." 5T:1030-17 to 1030-21. Furthermore, by reverse-phasing the conductors, PSE&G is able to cancel some level of magnetic fields and thereby reduce the levels produced by the Project. Exhibit P-9 (Direct Testimony of Kyle King) at 6-2 to 6-17. These steps are consistent with the guidance of the National Institute of Environmental Health Sciences, the World Health Organization, and other health agencies (Exhibit P-10 (Direct Testimony of William H. Bailey, Ph.D.) at 21-1 to 21-10 Exhibit P-18 (Rebuttal Testimony of William H. Bailey, Ph.D) at 16-26 to 17-2.

Mr. King has testified that there are currently no standards for magnetic fields in the State of New Jersey. Id. at 11-2 to 11-3. Moreover, only two states, Florida and New York have established transmission line edge of right-of-way magnetic field limits. *Id.* at 11-6 to 11-12. The Florida Department of Environmental Regulation established transmission line edge of right-of-way magnetic field limits of 150 mG for 230 kV transmission lines and 200 mG for 500 kV transmission lines. The New York State Public Service Commission established transmission line edge of right of way magnetic field limits of 200 milligauss for all transmission voltages. Id. The levels modeled by Mr. King associated with this Project would all be below these levels. See generally, Exhibit KGK-2 to Exhibit P-9.

Mr. King did testify that the State of New Jersey does have electric field guidelines associated with the edge of the right-of-way. Exhibit P-9 (Direct Testimony of Kyle G. King) at 10-14 to 10-15. Mr. King has testified that PSE&G will meet the State

of New Jersey's electric field requirements at the edge of the right of way. *Id.* at 10-19 to 10-20. He explains:

> The Project will produce approximately 1.6 kV/m on the 500 kV circuit side and 0.5 kV/m on the 230 kV circuit side of the right of way. For comparison, the existing 230 kV circuit's electric field level is approximately 0.8 kV/m.

*Id.* at 10-20 to 10-23. In addition, Mr. King testified that PSE&G will meet New Jersey's audible noise requirements at the edge of the right-of-way. *Id.* at 12-8 to 12-10.

3. Intervener Witness Martin Blank, Ph.D's Testimony Is Unreliable As His Research Has Not Been Replicated And His Opinions Have Been Criticized By Many International Agencies

Although the Municipal Interveners succeeded other interveners in sponsoring the testimony of Martin Blank, Ph.D in an attempt to support a contention that EMF is a health hazard, a close reading of Dr. Blank's testimony indicates that Dr. Blank's opinions are inconsistent with the myriad of research completed over 30 years on EMF. Additionally, Dr. Blank's own research is unreliable because many researchers have been unable to replicate his research. Finally, the on-line report which forms the basis for most of his testimony has been criticized by international agencies.

Dr. Blank argues that in vitro research that he has completed with HL-60 cells, as well as the opinions of the Bioinitiative working group, which published the online Bioinitative Report alleging health concerns associated with EMF, should be followed rather than the various international agencies that have performed weight-of-evidence analysis. Testimony of Martin Blank, Ph.D ("Blank Testimony") at p. 5, Q. 7. Dr. Blank claims that the Bioinitiative working group was inspired by the Bioelectric Magnetic Society, which "is a society which really contains the scientific backbone of those who are working on electromagnetic aspects of biology." 5T:1150-9 to 1150-14. He added

that the difference between the Bioinitative Report and the ICNIRP review is that the Bioinitiative Report was written by scientists who are currently active in particular areas of research. Exhibit P-40 (specifically, response to PSEG-Blank-12).

However, on cross examination, Dr. Blank admitted that over one-third of the Bioinitative Report was written by Ms. Cindy Sage, who is not a trained health scientist and not active in any particular field of science. 5T:1151-13 to 1151-15; 5T:1153-2 to 1153-7. He also admitted that portions of the Bioinitative Report actually conclude that there has been no clear connection between EMF and health hazards. Specifically, Section 5 of the Bioinitiative Report states that "to explain and/or support epidemiological observations, many laboratory studies have been conducted, but the results were controversial and no clear conclusion could be drawn to assess EMF health risk." Exhibit P-29 (excerpt of Section 5 of Bioinitative Report) at 3.

Additionally, Dr. Blank admitted that many international health agencies have criticized the Bioinitiative Report. 5T:1156-20 to 1156-23. The European Commission stated that:

> There is a lack of balance in the report; no mention is made of the fact of reports that do not concur with the authors' statements and conclusions. The results and conclusions are very different from those of recent national and international reviews on this topic.

Exhibit P-31 (European Commission comments on the Bioinitative Report); 5T:1157-5 to 1157-10. Likewise, the Health Council of the Netherlands also stated that the report "does not provide any ground for revising the current views as to the risks of exposure to electromagnetic fields." Exhibit P-32 (Health Council of the Netherlands comments on the Health Council of the Netherlands); 5T:1158-14 to 1158-16. Finally, the Austrialian Centre for Radiofrequency Bioeffects Research stated that the Bioinitiative Report "does

not appear to apply principles consistently, which biases its conclusions." Exhibit P-33; 5T:1159-12 to 1159-15.

Nevertheless, in the face of the overwhelming evidence to the contrary, Dr. Blank continues to allege that his research with HL-60 cells proves that EMF is a health concern. Blank Testimony at 7 and 8. Importantly, however, Dr. Blank failed to note in his direct testimony that scientists have been unable to replicate his research. 5T:1161-19 to 1161-21. In fact, Dr. Blank claims that the reason that those scientists have failed to replicate his research is that they have used a different set of HL-60 cells. 5T:1161-22 to 1162-1. However, on cross examination, Dr. Blank admitted that Gary Boorman and Russell Owen, the investigators from the National Institute of Health Sciences who published the *Evaluation of In Vitro Effects of 50 and 60 Hertz . . .,* were unable to replicate Dr. Blank's research even though they obtained the HL-60 cells from Dr. Blank and his colleagues at Columbia University. Exhibit P-36 (Boorman, Owen, et al publication) at 650 (Gene Expression Procedure); 5T:1162-2 to 1163-18.

Dr. Bailey also testified that many researchers who have attempted to replicate Dr. Blank's research with HL-60 cells have been unsuccessful. He stated:

> The EMF RAPID program also funded Dr. Balcer-Kubiczek to search for genes in HL-60 cells that might be responsive to 60-Hz magnetic field exposures. Balcer-Kubiczek and her colleagues reported in 2000 that none of a sample of 1,920 randomly selected genes of HL-60 cells was responsive to a 20,000 mG magnetic field, while about 1% of the genes were responsive to X-rays for which there is evidence for a causal relationship with childhood leukemia (Belson et al., 2007). Similarly, still other investigators reported an inability to replicate Dr. Blank's claims for the increased expression of certain other genes in HL-60 cells, e.g., Lacy-Hulbert et al. (1995); Lacy-Hulbert et al., 1998; Saffer and Thurston, 1995; Shi et al., 2003).
>
> One review that compared the results of Dr. Goodman's and Dr. Blank's work on HL-60 cells to other laboratories noted a prominent difference in

> the procedures followed – the laboratories that reported no effect of magnetic fields had taken effective steps to prevent experimenter bias by coding the samples so that the scientists analyzing the data had no means of knowing which samples had been exposed to magnetic fields or administered sham exposures until the conclusion of the experiment (Berg, 1999). Another review attributed the positive results obtained in HL-60 cells in Dr. Blank's laboratory and the lack of effect in other laboratories solely to systematic error introduced by experimental protocols and quantification methods (Lacy-Hulbert et al., 1998). Later studies performed by Dr. Blank and his colleagues to explain the failure of other laboratories to replicate their findings (Jin et al., 1997) did not report that they had taken any steps to address the concerns raised about the effectiveness of blinding Dr. Blank's team to the exposure conditions during the conduct and analysis of the experiments. Such blinding provides protection against experimenter bias, i.e., the results are influenced because the experimenter favors a pre-conceived outcome (Sackett, 1979)

Exhibit P-18 (Rebuttal Testimony of William H. Bailey, Ph.D.) at 7-11 to 8-7. Furthermore, Dr. Bailey testified during the evidentiary hearings that no public health agency makes direct extrapolations from in vitro studies, such as performed and relied upon by Dr. Blank, to public health determinations (5T: 1033-3 to 1033-13).

Dr. Blank also fails to note in his direct testimony that he has done research on the positive health effects associated with EMF. Exhibit P-38 (article from Journal of Cellular Physiology regarding myocardial function and EMF); Exhibit P-39 (article from Journal of Cellular Physiology regarding biosynthesis and EMF). In this article he and his co-authors examined effects of 80 mG magnetic fields and concluded "The use of EMFs for the induction of hsp70 for post-ischemia reperfusion treatment has clear advantages over the invasive elevated temperature treatment efforts tested to date. Non-ionizing EMF induction of hsp70 is safe, efficient and practical….we report a novel non-invasive technique to increase hsp70 levels using exposure to low energy, low frequency EMF. While stress proteins in cells and tissues have been previously utilized as

diagnostic markers and prognostic indicators, a safe, non-invasive method of augmenting endogenous defense mechanisms as a therapeutic tool, such as EMF exposure, has significant clinical potential." (p. 822). Dr. Blank testified further that "under proper circumstances you can utilize the biological response [associated with EMF] to your benefit." 5T:1166-20 to 1166-22. Still, Dr. Blank admits that there is not a generally accepted explanation of biological effects associated with EMF. In an article written by Dr. Blank and Dr. Reba Goodman for Cellular Physiology entitled *A Mechanism for Stimulation of Biosynthesis by Electromagnetic Fields: Charge Transfer in DNA and Base Pair Separation,* (Exhibit P-39), he wrote:

> The interplay between experiment and theory usually catalyzes scientific development, but thus far, studies of [electromagnetic] field interactions with biological systems have not led to a generally accepted explanation of established biological effects.

See also, 5T:1167-12 to 11667-18.

Finally, in his direct testimony, Dr. Blank argued that the National Institute of Environmental Health Sciences Report to Congress set an EMF threshold of 3-4 mG. Blank Testimony at 7. Dr. Bailey makes clear, however, that "[n]o scientific agency has recommended that 3-4 mG be used as a magnetic-field health standard." Exhibit P-18 (Rebuttal Testimony of William H. Bailey, Ph.D.) at 17-23 to 17-24. In fact, during cross examination, Dr. Blank stated, when discussing what levels of EMF should be permitted, that "I think we must do the best we can. . . . with ionizing radiation the rule of thumb is as low as reasonably achievable, so you work as best you can with the situation. We live in an imperfect world and we have to cope." 5T:1175-7 and 5T:1176-8 to 1176-12.

In sum, the only credible evidence on the record establishes that EMF is not a public health concern. Dr. Bailey has testified that, after 30 years of research, the

scientific community has not been able to conclude that there is a causal link between EMF and any health concern. Furthermore, Mr. King testified that the levels of EMF associated with the Project are similar to those that the public experiences on an everyday basis. Finally, the testimony of Dr. Blank has been contradicted by the conclusions of leading public health organizations, including the World Health Organization. His opinions were criticized by international agencies as "inconsistent" and "biased" and other researchers have been unable to replicate Dr. Blank's research. Accordingly, the BPU should determine that there is no reasonable basis in the record to conclude EMF is a health concern for those along the ROW of this Project, and EMF concerns should therefore not prevent the BPU from approving the Project.

**e. PSE&G Has Taken Prudent Steps To Reduce Environmental Impacts, Which Will Be Analyzed And Addressed In Connection With The New Jersey Department Of Environmental Protection Permitting Process And The Permitting Process Of Other Relevant Environmental Agencies**

Previously, in Section C.1.a. of this brief, PSE&G explained how environmental concerns in large part formed the basis for selection of Route B for the Project, as using an existing right-of-way will greatly reduce permanent impacts associated with constructing a major, 500kV transmission line over a substantial distance. If PSE&G had selected a virgin right-of-way to construct this Project, the environmental impacts would have been exponentially greater. See generally the ARI that was attached to Exhibit P-8 (Direct Testimony of Jack Happern) as Exhibit JH-1.

In addition, PSE&G has taken numerous other actions in order to minimize environmental impacts associated with the Project. Generally, Mr. Pollock, PSE&G's

environmental expert, testified that PSE&G is minimizing environmental impacts in the following way:

> Once the final route was selected, PSE&G and its consultants made every attempt to limit disturbance within the existing cleared or disturbed rights-of-way so as to minimize permanent impacts to wetlands, forested areas and other critical areas. During the design process, field study and mapping information including NJDEP's Landscape Data for T&E's, Highlands GIS information, wetlands, floodplain, and flood hazard area riparian areas were placed on the base design maps to aid in determining the placements of access roads and transmission structures. Critical areas were spanned aerially wherever feasible.
>
> During construction, impacts will either be temporary or permanent in nature. Temporary impacts will be limited by utilizing protective measures such as matting or the use of low profile vehicles designed for distributing weight so as not to cause unnecessary soil compaction in wetland areas. Matting can be made of steel, timber or plastic. Silt fencing and other soil erosion and sediment control measures will be utilized in accordance with approved plans from the respective Soil Conservation District.
>
> For certain critical species, such as bog turtles, pre-construction field surveys will be performed by United States Fish and Wildlife certified bog turtle surveyors. In addition, construction monitoring will be conducted to reduce any potential for mobile species to enter an area during construction. In addition, time or seasonal restrictions may be implemented in order to minimize potential impacts to threatened or endangered species.
>
> For the most part, it is my understanding that structure replacement will take place within the existing Right-of-Way in as near a location as the existing structures, and thus there will be minimal net loss of wetlands or critical resources. In the isolated event that an additional pole must be placed in a critical area because of engineering constraints, the permanent impact will be isolated to the footprint of the structure base or foundation. Any permanent impacts will be mitigated in accordance with the applicable laws and regulations of the governing entity PSE&G has proposed alternative locations for both switching stations in an effort to reduce the environmental impacts.

Exhibit P-3 (Direct Testimony of Robert Pollock) at 6-5 to 7-9. PSE&G also revised locations of transmission structures and access roads, where feasible, to

limit environmental impacts. 2T:525-11 to 525-16. As Mr. Crouch stated during cross examination by the Environmental Interveners' attorney:

> Some [of the adjustments to the access roads] were to adjust the access roads because of steep topography. Some were done at the request of discussions with property owners. Some were done to avoid either sensitive habitat and/or wetlands. And some were done to - - at the determination of constructability

*Id.* Finally, Mr. Pollock stated that that PSE&G is currently working on an avian protection plan with the United States Fish & Wildlife Service. 5T:1238-15 to 1238-19. Thus, PSE&G is taking all necessary precautions to minimize any impacts to the environment associated with this Project.

In fact, environmental considerations will be reviewed by numerous agencies with expertise on these issues. For instance, Mr. Pollock testified that the following federal agencies will be involved in PSE&G's permitting process:

> The U.S. Fish & Wildlife Service is a commenting agency on applications to the National Park, they don't per se issue approvals. The National Park Service is currently reviewing the Project. An application was submitted on behalf of both companies by PP&L. . . I would assume that the U.S. Army Corp of Engineers would also be commenting on that. The Appalachian Trail is also a party to our National Park Service application.

1T:75-7 to 75-20. Mr. Pollock later added the following in connection with State agencies:

> We have had several meetings with the New Jersey State Historic Preservation Office in consultation with this Project. Again, they are more of a commenting agency concerning the State process. We have made application to the Department of Environmental Protection for a wetlands approval for the Project, as I'm sure you guys know the Highland process, we also went through that.

1T:80-9 to 80-18. In addition, Mr. Pollock stated that the Company will coordinate with the New Jersey Department of Environmental Protections's Endangered and Non-game

Species Program and with the Highlands Council as part of Project development, and that regional soil erosion and settlement control agencies will need to issue permits for disturbances over 5,000 square feet. Exhibit P-3 (Direct Testimony of Robert Pollock) at 5-1 to 5-2 and 5-5 to 5-8.

The incontrovertible evidence in the record demonstrates that PSE&G has taken a proactive approach in an attempt to minimize environmental impacts associated with this Project. Furthermore, the participation of numerous federal and state agencies that will either issue permits associated with the Project or comment upon environmental impacts of the Project, underscores the fact that environmental concerns will be fully and substantially protected during the construction of this Project. Therefore, the Board should approve this Project.

***2. PSE&G's siting process appropriately considered concerns raised by affected municipalities, property owners and regulators and, as reflected in the record, refinements and optimizations to the Project design have been made where possible in response to those concerns. Moreover, these refinements have not changed the fundamental nature of the Project sought to be approved.***

During the hearings, the Municipal Interveners raised an unsupported allegation that the Project was somehow "not ready for prime time," (2T:317-18 to 318-3), as a result of design refinements and optimizations made over the past year as the Project has progressed through the engineering and design phase. Yet, the uncontested record from the testimony of the all of the engineering experts presented at hearing establishes that all modifications and refinements made over the past year were both (i) typical of a project of the size and scope of this Project and (ii) in virtually all instances, resulted from PSE&G's efforts to address issues raised by affected municipalities, property owners or governmental agencies in an attempt to minimize the impact of the proposed Project

without compromising overall Project design and efficacy.[52] In fact, it is precisely because the BPU recognizes that flexibility is needed in order to take public concerns into consideration that the analysis under N.J.S.A. 40:55D-19 does ***not*** require that the BPU approve the location of every access road or tower location. Instead, the Board must determine simply that the Project as a whole is reasonably necessary. *Public Service II* at 15 (affirming use of eminent domain in construction of Branchburg to Roseland transmission line and noting that evidence in Board proceeding revealed that significant route alterations were made as a result of numerous meetings between utility and local interested parties). To require otherwise would be impractical and would ensure that no project of this magnitude could ever be completed, because no project of the scope of this Project, which spans 16 municipalities and encompasses 45 miles, can be expected to proceed without certain refinements along the way.

Since the filing of the Petition on January 12, 2009, PSE&G has offered to implement certain design modifications to the Project in an effort to be responsive to governmental and public input and thereby benefit the "welfare of the public." However, the Project has remained fundamentally the same. Applicable precedent establishes that minor design optimizations are permitted throughout the BPU process. See, e.g., Public Service II at 15.

The facts in the present case provide a strong basis for BPU approval. In Public Service II, the BPU granted approval to PSE&G to build a 500kV transmission line without the locations of tower or access road being finalized. Public Service II 100 N.J. Super., at 10. The Board simply authorized PSE&G to choose the most appropriate

[52] 2T:307-12 to 309-17; 2T:447-12 to 448-8; 2T:524-19 to 525-16; 2T:527-3 to 528-8; 2T:529-16 to 530-18.

locations for the towers. Id. In the present case, the uncontroverted evidence in the record indicates that virtually all of the design optimizations were suggested in response to governmental and public input so as to benefit the public welfare. PSE&G believes it is its responsibility as a public utility, and an important part of the process under N.J.S.A. 40:55D-19, to review the Project to determine ways to minimize impacts to residents, municipalities and the environment. PSE&G has met that responsibility. This comports with the precedent the BPU established in the Public Service II case.

During the evidentiary hearings, PSE&G discussed two specific design optimizations: (1) optimizing the design of the conductors on the 500 kV side from a quad-bundled conductor to a tri-bundled conductor and on the 230 kV side from a dual-bundled conductor to a single conductor; and (2) optimizing tower and access road locations. Each of these was closely analyzed in the record and the undisputed evidence reflects that (i) neither of these types of optimizations changes the underlying nature of the Project, and (ii) both represent optimizations or alternatives proposed to respond to public input or environmental concerns that will benefit the welfare of the public.

**a. Change in the Design of the Conductors**

As part of the Project, PSE&G initially proposed a quad-bundled conductor on the 500 kV side of the ROW and a double-bundled conductor on the 230 kV side of the ROW. Exhibit P-5 (Direct Testimony of Richard F. Crouch) at 10-13 to 10-15. This proposal was put forth to ensure satisfaction of New Jersey Audible Noise Requirements, N.J.A.C. 7:29-1 et seq., at the edge of the ROW. Id. However, during final design, PSE&G contacted manufacturers of monopoles, the type of structure that many of the municipalities on the eastern end of the route preferred (which preference was expressed

in the December 2008 workshops and the June 2009 public hearings), and was told by the manufacturers that PSE&G would be impacting the manufacturing capability for monopoles with a quad bundled design. 2T:309-6 to 309-14; 2T:322-9 to 323-1. 2T:309-9 to 309-14. Therefore, PSE&G carefully reviewed the noise requirements and determined that it could meet the New Jersey regulations with a tri-bundled conductor for the 500 kV circuit and a single conductor for the 230 kV circuit. 2T:318-15 to 318-23.

The testimony in the matter is clear that the reduction in the amount of conductors will not affect any other electrical parameters, except that the electric fields would actually be reduced in this design. Mr. Crouch, PSE&G's Manager of Transmission – Outside Plant, testified that ampacity is not affected. T2:318-25 to 319-3. He stated that the line was originally designed for 3005 MVA divided over four wires, but the reduction in conductors would mean that the three conductors would carry 1000 MVA each. 2T:324-7 to 324-23. Similarly, Kyle G. King, a consulting electrical engineer retained by PSE&G to study certain of the effects of the transmission line, stated that "changing from a four conductor bundle to a three conductor bundle . . . would slightly lower the electric field level and slightly increase the audible noise level, but both parameters are still well within the New Jersey State regulations." 5T:1002-17 to 1002-22.

Therefore, in an effort to address the concerns of the public and municipalities, PSE&G agreed to reduce the number of conductors in order to construct monopoles wherever feasible. 2T:322-9 to 323-1. Based on the evidence in the record, it is clear that this optimization has no effect on the overall Project, except to benefit the public. In fact, when specifically asked whether the reduction in conductors would change the Project, Mr. Crouch testified definitively that it would not. 2T2:525-3 to 525-6.

### b. Tower Location and Access Road Optimizations

When PSE&G filed its application on January 12, 2009, PSE&G attempted to locate transmission structures as close to the existing towers as possible and chose preliminary locations for access roads that were determined to be feasible at that time. Exhibit P-5 (Direct Testimony of Richard F. Crouch) at 8-12 to 8-20. Furthermore, although PSE&G noted the access roads on Exhibit RFC-3 to Exhibit P-5, Mr. Crouch stated that access road locations were just preliminary and further design would have to be completed to confirm these locations. Exhibit P-5 (Direct Testimony of Richard F. Crouch) at 16-18 to 16-23.

After further design work, and in response to public input and environmental concerns, PSE&G has proposed new locations for certain access roads and transmission structures. 2T:307-24 to 307-5.[53] Some of the roads or structures were relocated or eliminated in order to minimize environmental impacts. 2T:525-11 to 525-16. Mr. Crouch testified that these refinements were made to "take into account public comments, field investigation work that has been done, comments by the Highlands, and then data that we gathered through detailed design effort." 2T-308-2 to 308-5. In fact, during cross examination by the attorney for the Environmental Interveners, Mr. Crouch testified at length that several access roads were revised or eliminated in order to minimize environmental impacts and respond to property owner concerns. 5T-1210-4 through 1224-21. He summarized the adjustments to the access roads by stating:

> Some [of the adjustments to the access roads] were to adjust the access roads because of steep topography. Some were done at the request of discussions with property owners. Some were done to avoid either

[53] All of the refinements to Exhibit RFC-3 as depicted on Exhibit RFC-3A have been set forth in Attachment RFC-3A to Exhibit P-5. 2T:308-12 to 308-15.

> sensitive habitat and/or wetlands. And some were done to - - at the determination of constructability.

2T:525-11 to 525-16. However, at no time have the optimizations of the access roads or tower locations changed the route of the Project, as all transmission structures will still be located within the existing transmission ROW. See Exhibit RFC-3A to Exhibit P-5.

As reflected in the record and discussed in this brief, throughout the engineering and design process, PSE&G has continued to review the Project in order to minimize impacts to the public where feasible. It would be impractical and against public policy to require an applicant to file an application pursuant to N.J.S.A. 40:55D-19 for a project of this size and not allow the applicant the ability to optimize the design. In fact, as discussed by Mr. Jacober and Mr. Millies, this design review and optimization is common and expected in a project of this size and length. 2T:529-16 to 530-18. In fact, Mr. Millies stated clearly that:

> A lot of times, with the size of a project like this and usually an end service date requirement, several tests have to be performed in parallel as well as the best information at the time has to be submitted with the permit application. As far as I am concerned, based on previous experience with out projects similar to this, this is proceeding as we would on other project.

2T:529-22 to 530-4.

Accordingly, as the BPU indicated in Public Service II, typical design issues are left to the utility to determine, as long as the utility attempts to minimize impacts associated with those design issues. In the present case, it is clear and undisputed from the record that these design optimizations, made before BPU approval, provide a significant benefit to the public and do not change the overall Project. Accordingly, there

is no legal impediment to the BPU approving this Project with these design optimizations.

**c. PSE&G's Proposed Alternatives To The Location Of The Switching Stations Have Been Presented As Options Only; However, They Represent The Most Appropriate Location From An Environmental and Public Perspective**

In the Petition filed on January 12, 2009, PSE&G proposed two locations for switching stations, one in the Township of Jefferson and one in the Township of East Hanover. Both would be built on property already owned by PSE&G. *See generally* Exhibit P-6 (Direct testimony of Richard I. Jacober). However, after performing further engineering/design work, engaging in discussions with the Highlands Council regarding the western terminus switching station and listening to concerns expressed by the East Hanover Township regarding the eastern terminus switching station, PSE&G believes that these two locations, while remaining feasible from an engineering perspective, do not represent the most appropriate locations from an environmental or public perspective. Thus, PSE&G has thoroughly examined alternatives for the two switching station locations. After conducting such a review, PSE&G has proposed the alternative of the Borough of Hopatcong for the station proposed in Jefferson Township and the alternative of an expanded existing PSE&G Roseland switching station for the station initially proposed in East Hanover.

As stated on the record, these stations are simply proposed alternatives and PSE&G is still ready, willing and able to construct the stations in Jefferson Township and East Hanover Township. 5T:1187-14 to 1187-20 and Exhibit S-23 (response to Alternative S-ENR-54). However, PSE&G believes that the Hopatcong and Roseland locations represent better alternatives from the perspective of environmental impacts and

impacts to the public. Id. As a result, PSE&G respectfully requests that the BPU approve this Project with these two alternative locations for the switching stations.

1. Alternative Location of Station in Hopatcong

As part of the Project, it is necessary for PSE&G to tie the new 500 kV transmission line into the existing Branchburg to Ramapo 500 kV transmission line (the "Tie-In Station"). Petition at 7, ¶14. PSE&G originally proposed to construct the Tie-In Station in Jefferson Township on property already owned by PSE&G. Exhibit P-6 (Direct testimony of Richard I. Jacober) at p. 5-6 to 5-10 and Exhibit RIJ-2 thereto. However, after receiving public comments associated with this proposed station in Jefferson Township and input from the Highlands Council staff, PSE&G determined that constructing an open air station in Jefferson Township would have a significant impact on the forested wetlands in Jefferson. Exhibit MI-2 (PSE&G's Amended Highlands Applicability Determination Application).

Therefore, after discussions with the Highlands Council, PSE&G proposed an alternative site for the station in the Borough of Hopatcong. PSE&G provided public notice to each municipality affected by the Project when it filed its Highlands Amended Application (1T:162-1 to 162-3; Exhibit MI-2 (PSE&G's Amended Highlands Applicability Determination Application)), as well as to all parties in this matter by providing the parties with a copy of PSE&G's letter to Commissioner Fiordaliso dated August 21, 2009.

Based on the undisputed testimony submitted by PSE&G, it is clear that moving the Tie-In Station from Jefferson Township to the Borough of Hopatcong is a benefit to

the public. PSE&G therefore requests that the BPU approve the Project with the Tie-in Station in the Borough of Hopatcong.

2. Alternative Location of Station in Roseland

As part of the Project, PSE&G must build an eastern terminus station (the "Eastern Terminus Station"). Petition at 7, ¶11. Originally, PSE&G proposed building the Eastern Terminus Station on property that PSE&G currently owns in East Hanover Township. Exhibit P-6 (Direct Testimony of Richard I. Jacober) at 4-5 to 4-10 and Exhibit RIJ-1 thereto). However, during meetings with East Hanover Township and during the public hearings convened by the BPU on June 30, 2009, PSE&G was informed that East Hanover Township did not want the switching station built in its town as it would be located too close to a residential development. In fact, East Hanover Township encouraged PSE&G to determine whether the station could be built at PSE&G's existing station property in Roseland. 2T:311-1 to 311-5. In addition, as stated in Exhibit S-23 (response to Alternative S-ENR-54):

> After hearing concerns expressed by East Hanover Township regarding the location of the proposed East Hanover Switching Station, PSE&G has determined that it is feasible to locate the eastern terminus station of the Project in Roseland rather than East Hanover.
>
> Locating the eastern terminus station in Roseland, utilizing an existing station property, would limit new disturbance without changing the route of the Project. In connection therewith, attached hereto please see alternative Sheet 37 of Exhibit RFC-3, which depicts the location of the new station at Roseland. If this location is implemented this map[] preliminarily illustrates the distance to the existing property lines. Consistent with the design for the East Hanover Switching Station, and due to property size constraints at Roseland, the new Roseland Switching Station facilities would utilize the same Gas Insulated Switchgear ("GIS") design as was proposed for East Hanover.

Initially, PSE&G informed East Hanover Township that it could not build the Eastern Terminus Station in Roseland because there was not enough room due to the existence of capacitor banks. 2T:333-25 to 334-4. However, in an effort to resolve the concerns of East Hanover, PSE&G was able to create a design that would remove existing facilities from its Roseland station property to make room for the Eastern Terminus Station equipment. 2T:334-5 to 334-13. The design, which has been provided to the parties in Exhibit S-23 (response to Alternative S-ENR-54), clearly shows where the facilities would be located in Roseland. Mr. Jacober indicated in his testimony that the facilities in Roseland would be essentially the same as the facilities in East Hanover. 2T:520-11 to 520-17; 2T:329-6 to 329-12. In addition, Mr. Pollock indicated that the environmental impacts would be significantly decreased by moving the Eastern Terminus Station from East Hanover to Roseland. 5T:1241-22 to 1242-1. Therefore, the evidence clearly indicates that moving the station to Roseland would benefit the public welfare.

Moreover, moving the location of either switching station does not change the route of this Project. The Project still follows an existing transmission ROW. As John P. Ribardo, PSE&G's Project Manager testified when asked if moving the switching station to Roseland changed the "route" of the Project:

> Well the route of the 230 line still has to end and terminate in Roseland. We would have had – in the situation where we have the station in East Hanover, the 500kV lines come into the station. Through transformers voltage is reduced to 230kV and lines go to the 230. Now, the situation is we take the transformers and switching station and put it into Roseland and then we run the 500kV lines, instead of dropping into the station, it goes directly over the river into the new switching station. So its all within the exact same right-of-way.

1T:177-9 to 177-20.

Furthermore, as demonstrated by the testimony of Mr. Jacober and PSE&G's environmental expert, Robert Pollock, acceptance of the alternative switching station locations would enhance the overall public benefit of the Project. Mr. Jacober testified that:

> Number one - Roseland is an existing station in our switching station facility so rather than having another facility on the other side of the River, we have been able to leverage the Roseland site to install it in that location. And in addition to that, Mr. Pollock can probably address this a little bit further, but it is environmentally better because there are some wetland areas on the East Hanover site that we can avoid and not disturb.

5T:1241-12 to 1241-21. To which Mr. Pollock added:

> Yes, the impacts associated with the Roseland Switching Station would be far less from a wetlands perspective and a natural resource prospective because it will be located on a site with an existing switch – existing switching station.

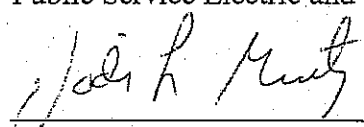
Given the fact that moving the Eastern Terminus Station to Roseland benefits the public, PSE&G respectfully requests that the BPU approve this Project with the Eastern Terminus Station located in Roseland.

## VI.

## CONCLUSION

For all of the foregoing reasons, PSE&G respectfully urges the Board to issue a final Decision and Order under N.J.S.A. 40:55D-19 (i) determining that the construction of the Project is reasonably necessary for the service, convenience or welfare of the public; (ii) authorizing PSE&G unconditionally to commence construction of the Project while recognizing the ongoing jurisdiction of other agencies; (iii) authorizing the construction of the requisite New Jersey switching stations at the alternate locations proposed by PSE&G in the Borough of Hopatcong and in Roseland, (iv) permitting PSE&G to revise the Project as required or authorized by other agencies having jurisdiction over aspects of the Project; and (v) granting such other approvals as are necessary or appropriate under all of the circumstances.

Respectfully submitted,
PSEG SERVICES CORPORATION
Attorneys for Petitioner,
Public Service Electric and Gas Company



Jodi L. Moskowitz, Esq.
General Regulatory Counsel – Operations and Compliance
PSEG Services Corporation
80 Park Plaza, T5G
Newark, New Jersey 07102

On the Brief:

Marc B. Lasky,
Morgan, Lewis & Bockius LLP
89 Headquarters Plaza North
Suite 1435
Morristown, New Jersey 07960

Tamara L. Linde
David K. Richter
Alexander C. Stern
PSEG Services Corporation
80 Park Plaza, T5G
Newark, New Jersey 07102