

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
ENERGY FACILITY SITING BOARD**

In re The Narragansett Electric Company :  
d/b/a National Grid : Docket No. SB-2008-02  
(Rhode Island Reliability Project) :

**DECISION AND ORDER**

Dated August 12, 2010

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## I. INTRODUCTION

In this proceeding, the Narragansett Electric Company d/b/a National Grid (“National Grid”) is seeking approval from the Energy Facility Siting Board (“EFSB” or the “Board”) to construct and alter major energy facilities. National Grid proposes to construct a new 21.4 mile, 345 kilovolt (kV) transmission line, relocate and reconstruct 20.0 miles of each of two existing 115 kV transmission lines, relocate and reconductor short segments of existing 115 kV transmission lines, all within an existing right-of-way (ROW), and upgrade equipment at several substations to accommodate the new 345 kV transmission line (collectively the “Rhode Island Reliability Project” or “Project”).

The Energy Facility Siting Act (R.I.G.L. §42-98-1 et seq.) (the “Act”), requires an applicant for a license from the EFSB to demonstrate that:

- (i) the facility is needed,
- (ii) the proposed facility is cost justified and will [transmit] electricity at the lowest reasonable cost consistent with applicable statutes, and
- (iii) the facility will not cause unacceptable harm to the environment and will enhance the socioeconomic fabric of the state.

## II. TRAVEL OF THE CASE

On September 8, 2008, National Grid filed an application for a license with the Board. The Board held its preliminary hearing pursuant to §42-98-9(a) on November 12, 2008. During the course of the Board’s hearings, the following appearances were entered:

FOR NATIONAL GRID:

Peter V. Lacouture, Esq.  
Robinson & Cole LLP

FOR THE DIVISION:

Paul J. Roberti, Esq.<sup>1</sup>  
Assistant Attorney General  
and  
Leo J. Wold, Esq.  
Special Assistant Attorney General

FOR THE TOWN OF JOHNSTON:

William J. Conley, Jr., Esq.  
Town Solicitor

W. Mark Russo, Esq,  
Moshe S. Berman, Esq.  
Ferrucci Russo P.C.

FOR ISO-NE:

Kevin Flynn, Esq.  
ISO New England  
Eric J. Krathwohl, Esq.  
Rich May, a Professional Corporation

FOR THE COMMISSION:

Patricia S. Lucarelli, Esq.  
Chief of Legal Services

The EFSB's preliminary decision and order was issued on December 19, 2008. In re The Narragansett Electric Company (Rhode Island Reliability Project), Docket No. SB-2008-02, Preliminary Decision and Order (Order No. 61, December 19, 2008) (hereinafter "Preliminary Order.") In the Preliminary Order, the Board designated twenty-two state and local agencies to review the Project and provide advisory opinions by June 15, 2009.

Following proceedings before the designated agencies, the Board convened local public hearings pursuant to §42-98-9.1(b) in North Smithfield (June 16, 2009), Smithfield (June 24, 2006), Johnston (June 25, 2009), Cranston (July 7, 2009), West Warwick (July 8, 2009) and Warwick (July 9, 2009). Final hearings commenced on July 8, 2009, continued on July 14 and October 19, 2009, and concluded on May 20, 2010. The EFSB's final decision is due within sixty days of the conclusion of the final hearing. R.I.G.L. §42-98-11(c).

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<sup>1</sup> In the course of the proceedings, Mr. Roberti was appointed to the Public Utilities Commission.

### III. FACTS

#### A. The Project

The Project consists of the construction of a new 345 kV transmission line, the alteration of existing 115 kV transmission lines, and the upgrade of existing substations. The components are summarized below and are described in more detail in Section 4 of Volume 1 of National Grid's Environmental Report for the Project. Volumes 1 and 2 of the Environmental Report were admitted as Exhibits National Grid-2 and 3, respectively (collectively the "ER.") A map of the Project area is contained in ER Vol. 2, Figure 2-1, and more detailed aerial photographs showing the route alignment are contained in Figure 2-2.

##### 1. Construct a New 345 kV Transmission Line from West Farnum Substation to Kent County Substation

National Grid proposes to construct a new 345 kV transmission line from its existing West Farnum Substation, on Greenville Road in North Smithfield, to the Kent County Substation, on Cowesett Road in Warwick, a distance of approximately 21.4 miles. The new 345 kV transmission line will be constructed within the existing ROW which has been held by National Grid and used for transmission purposes since the 1950s. The new 345 kV transmission line will pass through portions of North Smithfield, Smithfield, Johnston, Cranston, West Warwick, and Warwick. The route of the new 345 kV transmission line is illustrated in ER Vol. 2, Figure 4-1. The existing ROW is generally 250 feet wide and presently contains the 332 345 kV transmission line, the S-171 and T-172 115 kV transmission lines, and, in places, 23 kV and 12 kV sub-transmission lines.

The new 345 kV transmission line will be constructed east of and adjacent to the existing 332 345 kV line on the ROW as illustrated in ER Vol. 2, Figure 4-2, Sheets 1 to 5, and will be

constructed primarily with steel pole davit arm structures set upon reinforced concrete caisson foundations. ER Vol. 1, §4.3.1.

2. Relocate and Reconstruct Existing S-171 and T-172 115 kV Transmission Lines from Vicinity West Farnum Substation to Vicinity Kent County Substation

National Grid proposes to relocate and reconstruct its existing S-171 and T-172 115 kV transmission lines from the vicinity of the West Farnum Substation to the vicinity of the Kent County Substation, a distance of approximately 20.0 miles. This reconfiguration is being done in order to create an open “slot” on the ROW in which to construct the proposed new 345 kV transmission line described above. ER Vol. 2, Figure 4-2, Sheets 1 through 5, provide cross-section drawings showing the configuration of transmission lines and structures following the completion of the Project.<sup>2</sup> The reconstructed S-171 and T-172 transmission lines will each be constructed primarily with steel pole davit arm structures set upon reinforced concrete caisson foundations. ER Vol. 1, §4.3.2.

3. Relocate Existing H-17 115 kV Transmission Line in the Vicinity of West Farnum Substation

National Grid proposes to relocate its existing H-17 115 kV transmission line between the West Farnum Substation and a point approximately 0.15 miles south of Greenville Road, a total distance of approximately 0.3 miles. This will create an open slot on the ROW in which to construct the proposed 345 kV transmission line. The H-17 115 kV transmission line will be relocated approximately 30 feet to the east in this area. ER Vol. 1, §4.3.3.

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<sup>2</sup> A revised version of Figure 4-2, Sheets 1 through 5, was provided as an attachment to David Beron’s prefiled testimony of June 29, 2009 (Exhibit National Grid-16A.) The revision consisted of separating the “before” and “after” cross section views onto separate panels of the page.

#### 4. Relocate B-23 Transmission Line at West Farnum Substation

In order to facilitate the equipment additions and modifications at West Farnum Substation, National Grid will relocate several spans of the B-23 115 kV transmission line to provide adequate clearance from the proposed substation equipment. The existing B-23 line exits the substation to the north and runs around the perimeter of the substation, eventually heading northwest along the existing ROW toward Sherman Road Substation. The relocation will eliminate one existing structure within the substation to make room for other equipment modifications within the substation as described below. See ER Vol. 2, Figure 2-2, Sheet 1 of 40; ER Vol. 1, §4.3.4.

#### 5. Reconductor G-185N 115 kV Transmission Line from Drumrock Substation to Kent County Substation

National Grid proposes to reconductor its existing G-185N 115 kV transmission line from the Drumrock Substation to the Kent County Substation, a distance of approximately 1.0 mile along existing ROW in Warwick. The route of the G-185N line is shown on ER Vol. 2, Figure 4-7. A typical cross-section of the ROW is shown on Figure 4-8. ER Vol. 1, §4.3.5.

#### 6. Modify Kent County Substation

The Kent County Substation is located on Cowesett Road in Warwick. To accommodate the new 345 kV transmission line position within the Kent County Substation, the substation must be modified with various equipment upgrades and additions, including:

- Install a new 345 kV bay to include three new 345 kV circuit breakers;
- Install a third 345/115 kV 269/358/448 MVA autotransformer (the second transformer was added in 2009 as part of a separate project);
- Install a new 115 kV bay to include two new 115 kV circuit breakers; and



- Relocate several spans of the existing G-185S and L-190 115 kV transmission lines south of the substation to accommodate the new and relocated equipment.

ER Vol. 2, Figure 4-9 depicts the existing conditions and the proposed layout of the Kent County Substation. ER Vol. 2, Figure 2-2, Sheet 38 of 40 shows the G-185S and L-190 line segments that will be relocated. ER Vol. 1, §4.3.6.

#### 7. Equipment Additions at West Farnum Substation

To accommodate the new 345 kV transmission line position within the West Farnum Substation, National Grid will modify the substation with various equipment upgrades and additions. The substation design was revised between the time the ER was prepared and the time National Grid witness Todd Kopoyan, P.E. filed prefiled testimony in June, 2009 (Exhibit National Grid-14D.) Mr. Kopoyan explained that the revised design would reduce the number of outages that would be necessary in order to modify the substation. The revised design is an all-Gas Insulated Switchgear (GIS) design and includes the following:

- Four bays of new 345 kV GIS consisting of twelve circuit breakers and associated disconnects and buswork;
- A new building to house the GIS;
- A new control house for the relay and control equipment; and
- Five new transmission line termination structures.

The existing 345 kV Air Insulated Switchgear (AIS) ring bus will be removed at the end of the Project. The revised design of the West Farnum Substation is shown in the revised Figure 4-10 and described in revised paragraph 4.3.7 of the ER which is attached to Mr. Kopoyan's prefiled testimony as attachments TKG-3 and TKG-4.

## B. Advisory Opinions

The Board requested advisory opinions from twenty-two state and local agencies and officials. Preliminary Order, pp. 18-19. Thirteen agencies submitted advisory opinions or responses; seven building inspectors and zoning and planning boards did not.<sup>3</sup> The substance of the advisory opinions will be discussed in the Board's analysis of the legal issues, below.

## C. Witnesses

The parties presented a total of 16 witnesses. The subjects addressed by each of the witnesses are listed here and a more detailed review of the witnesses' testimony is included as part of the analysis of the legal issues before the EFSB.<sup>4</sup>

### 1. National Grid Witnesses

David J. Beron, P.E., P.M.P., Lead Project Manager for the Project, introduced the Project, addressed Project costs and explained alternatives to the Project. In subsequent prefiled testimony, he addressed a number of points raised in the prefiled testimony of Gregory L. Booth, witness for the Rhode Island Division of Public Utilities and Carriers ("Division"), addressed issues raised in several advisory opinions, commented on the recommendations contained in Environmental Design & Research's (EDR) Visual Impact Assessment ("VIA") and, finally, explained a reconfiguration of the ROW in West Warwick, north of Wakefield Street, to address issues raised by abutters. Exhibits National Grid-7A, 14A, 16A, 28A and 34.

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<sup>3</sup> The PUC determined that, with the retirement of Commissioner Holbrook, it would not have a quorum to decide the case. As a result, it transmitted the evidence before it to the EFSB for its consideration. (See letter from Cynthia Wilson-Frias, Esq. dated April 8, 2009 (Ex. EFSB-5.)) The Smithfield Planning Board heard the case on May 28, 2009, but apparently did not file an advisory opinion with the EFSB.

<sup>4</sup> Pre-filed testimony of Messrs. Beron, Stevens, Collison, Kopoyan and Campilii was initially filed with the PUC on February 20, 2009. After the PUC transferred the record to the EFSB, this prefiled testimony was introduced before the Board as National Grid Exhibits-7A through 7E.

Todd G. Kopoyan, P.E., a principal engineer with Energy Initiatives Group, LLC (“EIG”) and an assistant Project Manager for the substation components of the Project, explained the modifications that were planned at the Kent County and West Farnum Substations as part of the Project. Exhibits National Grid-7D and 14D.

Mark Stevens, P.E., Lead Senior Engineer at National Grid in the Transmission Planning Department, explained the planning process by which the need for the transmission system improvements were identified. He described the transmission planning study which he conducted and reviewed several alternatives. He explained the impact of recent changes in the market and load forecast on the need for the Project and addressed several issues raised in the prefiled testimony of Gregory Booth. Exhibits National Grid-7B and 14B.

David M. Campilii, P.E., is a Consulting Engineer employed by National Grid in the Network Asset Planning Department. He is responsible for the design, licensing and construction of underground transmission and distribution facilities. Mr. Campilii described the underground transmission alternatives which were considered as part of the Project, responded to issues raised in the testimony of Gregory Booth, and explained the feasibility of constructing short underground segments, which Mr. Campilii referred to as “dips,” in an overhead transmission line. Exhibits National Grid-7E, 14E and 16B.

Kenneth K. Collison, the head of the transmission and ancillary services group at ICF Resources, LLC, summarized ICF’s report entitled “Assessment of Non-Transmission Alternatives to the NEEWS Transmission Projects: Rhode Island Reliability Project” (August, 2008). Mr. Collison also filed rebuttal testimony to address certain aspects of Gregory Booth’s testimony on behalf of the Division. Exhibits National Grid-7C and 14C.

Susan Moberg, P.W.S., Senior Project Manager and Manager of the Environmental Sciences Department in the Providence office of Vanasse Hangen Brustlin, Inc. (“VHB”), explained the environmental conditions of the area of the proposed Project and the potential impacts of the Project on the area. She explained the erosion and sediment control plan which National Grid had prepared for the Project and addressed issues raised in the advisory opinion of the Warwick Planning Board. Exhibit National Grid-16C.

John D. Hecklau, Joanne C. Gagliano and Eric M. Mainzer, from EDR, testified as to the visual impact of the Project. They summarized the VIA which they had prepared for the Project (Exhibit National Grid-4), addressed the impacts of minor Project design changes since completion of the VIA, and responded to visual impact issues raised by the City of Warwick Planning Department and by the Statewide Planning Program in their advisory opinions. Exhibit National Grid-16D.

William H. Bailey, Ph.D., Principal Scientist in the Health Sciences Practice at Exponent, presented a review of the status of health research regarding exposure to electric and magnetic fields (“EMF”) prepared by Exponent and its calculations of EMF and audible noise associated with the existing transmissions lines and proposed Project. Dr. Bailey also prepared a report entitled “Discussion of Rhode Island Longitudinal EMF Health Study” in response to questions from the Board. Exhibits National Grid-16E and 40.

Finally, Joseph M. Drouin, P.E., of Power Engineers, Inc., who is serving as Project Engineer responsible for the overhead transmission lines associated with the Project, addressed clearance requirements for overhead electric transmission lines and also discussed a report by Edward G. McGavran, III, P.E., which was submitted by the Town of Johnston. Exhibit National Grid-28B.

## 2. Division Witnesses

Gregory L. Booth, P.E., President of PowerServices, Inc., an engineering and management services firm, testified on behalf of the Division. Mr. Booth reviewed the need for the Project, the reasonableness of the cost as projected by National Grid and alternatives to the Project. Exhibit DPUC-1A.

Richard S. Hahn, Principal Consultant for LaCapra Associates, reviewed and commented on the load forecast which was used by ISO-New England and National Grid in determining that the Project was needed. Exhibit DPUC-1B.

## 3. ISO-New England Witness

Frank Mezzanotte, Manager of Area Transmission Planning at ISO-New England (“ISO-NE”), testified about ISO-NE’s planning criteria, the relationship of the planning criteria to various standards and requirements, and supported the need for the Project. Exhibit ISO-1.

## 4. Johnston Witnesses

Makram H. Megali, P.E., Director of Public Works for the Town of Johnston, testified about the concerns of the Town of Johnston related to the Project. Exhibit Johnston-1A.

Timothy Chapman, Esq., Assistant Town Solicitor for the Johnston Planning Board, testified about matters related to the taxation of property by the Town of Johnston. Exhibit Johnston-1B.

## 5. Public Statements

The Board heard public statements from numerous members of the public at the evening hearings held between June 16 and July 9, 2009. It also heard statements from several West Warwick residents at its October 19, 2009 hearing.

#### IV. QUESTIONS PRESENTED

An applicant for a license from the EFSB is required by §42-98-11(b) to demonstrate that:

- (i) the facility is needed,
- (ii) the proposed facility is cost justified and will [transmit] electricity at the lowest reasonable cost consistent with applicable statutes, and
- (iii) the facility will not cause unacceptable harm to the environment and will enhance the socioeconomic fabric of the state.

The Board will review the evidence before it using the same framework that was used to analyze the issues in the Preliminary Order. Preliminary Order, pp. 9-13.

#### V. ANALYSIS

A. Issue 1 - Is the proposed alteration necessary to meet the needs of the state and/or region for energy?

In the Preliminary Order, the Board requested that the Rhode Island Public Utilities Commission (“PUC” or “Commission”) render an advisory opinion as to the need for the Project. The need for the Project had been addressed in Section 3.0 of the ER and in three appendices to the ER: Appendix D (Southern New England Transmission Reliability – Report 1 – Needs Analysis, ISO New England, Inc. (January, 2008)), Appendix E (New England East-West Solutions – Report 2 – Options Analysis, ISO New England, Inc. (June, 2008)) and Appendix F (Assessment of Non-Transmission Alternatives to the NEEWS Transmission Projects: Rhode Island Reliability Project, ICF International (August, 2008.))

After National Grid, the Division, and ISO-NE filed their testimony with the Commission but before the Commission conducted a hearing, it determined that it would not have a quorum to hear the case and render an advisory opinion. Consequently, the PUC closed its docket and transferred the filings to the EFSB for its determination of need and cost. See April 8, 2009 letter

from Cynthia G. Wilson-Frias, Esq., Senior Legal Counsel, to Nicholas Ucci, Coordinator, Rhode Island Energy Facility Siting Board. Exhibit EFSB-5.

As a result, the testimony on the need for the Project from National Grid, the Division, and ISO-NE witnesses was heard by the EFSB during its final hearings.

Mark Stevens, National Grid Transmission Planner, testified about National Grid's transmission planning process. Transmission planning studies are conducted to determine compliance with applicable reliability standards including "the National Grid Transmission Guide, the ISO-NE Planning Procedures, the Northeast Power Coordinating Council (NPCC) Criteria and the North American Electric Reliability Corporation (NERC) Standards." Stevens, pp. 3-4 (Exhibit National Grid-7B.)<sup>5</sup>

The NEEWS studies (Appendices D and E to the ER) were conducted by a working group with representatives of ISO-NE, National Grid and Northeast Utilities. Mr. Stevens conducted National Grid's part of the NEEWS study. Stevens, p. 2. Mr. Stevens characterized the NEEWS study as "one of the most geographically comprehensive planning efforts to date in New England, addressing five interrelated problems in three states and multiple service territories." Stevens, pp. 2-3. The goal was to address regional transmission system reliability and constrained generation throughout New England.

Mr. Stevens testified that applicable standards require that loadings on transmission lines and other facilities be kept within the capabilities of the equipment and that voltages be maintained within acceptable ranges. Stevens, p. 4. The analysis which he prepared identified transmission reliability concerns which were caused by a number of factors, including load growth in southern Rhode Island, the possible unavailability of generating units, and possible

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<sup>5</sup> Witnesses' testimony will be cited by their last name and page number. Supplemental or rebuttal testimony will be identified as such or by date if the witness has provided more than one set of supplemental testimony.

transmission outages. Stevens, p. 5. These factors could, under certain conditions, lead to system overloads which would require load shedding and potential voltage collapse and blackouts for large parts of National Grid's system in Rhode Island.

Stevens explained that he had reviewed the results of the latest load projections and of the latest Forward Capacity Auction and that these did not significantly reduce the need for the Project. Stevens, pp. 6-7. In conclusion, he testified:

After examining the transmission and non-transmission alternatives, it was determined that only the proposed alternative of a new 345 kV line between the West Farnum and Kent County Substations (along with the other components that are part of the proposed alternative) fully addressed the needs and reliability concerns of the Rhode Island area transmission system.

Stevens, p. 15.

National Grid also presented the prefiled testimony of Kenneth Collison who explained the results of an assessment of non-transmission alternatives (NTA) to the Project. Prior to his detailed analysis of NTA to the Project, Mr. Collison testified that "ICF's study showed that [the Project] resolved all line overloads and voltage violations, even when an important generation facility was out of service." Collison, p. 5 (Exhibit National Grid-7C.)

Frank Mezzanotte, manager of area transmission planning at ISO-NE, supervised the working group which undertook the NEEWS studies. Mezzanotte, p. 2 (Exhibit ISO-1.) Mr. Mezzanotte explained that because of ISO-NE's concerns about the reliability of the electric system in Rhode Island, the working group identified and evaluated possible transmission solutions. The result of this analysis was summarized in the New England East-West Options Analysis (Appendix E to the ER) and included the selection of the Project as the recommended solution for the Rhode Island reliability issues. Mezzanotte, pp. 2-3.



After explaining the issues with thermal overloading of equipment and low voltage, Mr. Mezzanotte testified that the Project “will address the reliability issues [in Rhode Island] by eliminating the thermal and voltage criteria violations. Moreover, the transmission upgrades will ensure that Rhode Island’s transmission system remains in compliance with NERC, the NPCC and the ISO-NE reliability standards.” Mezzanotte, p. 14. Mr. Mezzanotte concluded his testimony by confirming that ISO-NE supports the Project. He noted that the addition of the new 345 kV line from West Farnum to Kent County would provide needed support to the southwestern Rhode Island area if the existing 345 kV line (Line 332) is lost, and either of two generating plants is out of service. Mezzanotte, p. 15. He concluded by characterizing this as critical reinforcement to the system in Rhode Island.

The Division’s witness, Gregory Booth, questioned Mr. Stevens’ “single contingency analysis” which would include both a generator and a transmission line out of service. He suggested that this appears to be a double contingency but ultimately concluded that “it does, however, have a potential to occur.” Booth, p. 21 (Exhibit DPUC-1A.) Mr. Stevens responded in his supplemental prefiled testimony and offered five examples of reasons why a generator may not be available, ranging from bid price to gas supply to a forced outage. He concluded, “additionally it is not prudent to design a system such that it depends on one particular generator in order to meet the required reliability criteria.” Stevens Rebuttal, pp. 1-2 (Exhibit National Grid-14B.)

After reviewing Mr. Stevens’ testimony, Mr. Booth concluded:

the proposed Project resolves the planning criteria violations (voltage and thermal) and thus results in a more enhanced level of transmission reliability. . . . The ER and his testimony outline a need that is supported by the study and the [ER] Table 3-1 summary of the most severe planning criteria violations. In reviewing the proposed Project and the alternative projects, including the no-build option, in light of the transmission planning criteria [of] National Grid,

ISO-NE, NEPOOL, NPCC and NERC, the proposed Project stands out as a reasonable solution for Rhode Island while having the additional benefit of being the most prudent alternative to incorporate in the overall NEEWS project.

Booth, pp. 21-22.

The Division's other witness, Richard Hahn, was retained by the Division "to review and comment on the load forecast that is used in the Needs Analysis" for the Project. Hahn, p. 2 (Exhibit DPUC-1B.) In rebuttal to Mr. Hahn's testimony, Mr. Stevens explained the difference between the forecast in the 2006 Capacity, Energy, Load and Transmission Report (CELT) and the forecast provided in Mr. Stevens' prefiled testimony (the CELT forecasts include load and losses); addressed the use of the 2008 Power Supply Area Forecast (it was used by Mr. Stevens to respond to DPUC data request 2-11 but not in his load flow runs); and addressed the fact that there are references to multiple forecasts. In responding to the final point, Mr. Stevens explained that during the study, which lasted more than four years, many factors changed, including the forecast. As a result, he used different load forecasts at different stages of his work. He concluded "the key point is that all the forecasts over the course of the study continue to show a strong need for the Rhode Island Reliability Project." Stevens Rebuttal, pp. 5-6.

After discussing possible adjustments to the forecast as presented by Mr. Stevens, Mr. Hahn concluded that the adjustments do not affect the need for the Project. Hahn, p. 8. In commenting on this testimony, Mr. Stevens explained that the tables which he and Mr. Hahn have presented "clearly indicate that there is no need to go through the exercise of redoing the needs analysis with the latest data." He testified that if the analysis were rerun, it would have a very slight reduction in the overload "which would not materially decrease the need for the Project." Stevens Rebuttal, p. 7.

Mr. Booth confirmed the need for the Project in the following terms:

I am of the opinion that the need for the proposed Project is clearly demonstrated in filings by National Grid. I believe the studies, including the scenario analyses, have been prepared on a reasonable basis utilizing reasonable and acceptable assumptions within the utility industry, including the standards as outlined by the ISO New England. I believe that the study's contingency analyses, overall ER, and its appendices combined with the discovery materials demonstrate that if a solution is not approved and the Project is not approved that there will, in time, be a situation arise under one of the contingency scenarios that will result in a significant loss of load. I do not believe that it is in the best interest of the electric customers to accept a contingency analysis scenario resulting in the likely loss of load approaching 500 megawatts and potentially even greater in future years. This, in my professional opinion, would be an unacceptable risk to impose on the State of Rhode Island and potentially a broader New England area and, therefore, a solution is necessary. My evaluation concludes that the proposed Project, including the new 345 kV line, 115 kV line upgrades, switching station upgrade, and methodology of design, construction and routing represents the best solution for Rhode Island.

Booth, pp. 44-45.

The testimony of the witnesses for all three parties that addressed the issue, National Grid, ISO-NE and the Division, agreed that the Project was needed in order to comply with the applicable reliability standards, to address potential overloads and to avoid the possibility of voltage collapse and a blackout in National Grid's Rhode Island service area. As a result, the Board finds that the Project is needed.

- B. Issue 2 - Is the Project cost justified and can it be expected to transmit power at the lowest reasonable cost to consumers consistent with applicable laws and regulations or is a waiver of such laws and regulations justified? (R.I. Gen. Laws, §42-98-11(b)(2))

Issue 2 has been separated into three subsidiary issues by the Board in the Preliminary Order: 2(a) is the Project cost justified; 2(b) will the Project comply with laws applicable absent the Act; and 2(c) would a waiver from certain laws be justified?

1. Issue 2A - Is the Project cost justified?

a. Project Cost.

The issue of whether the Project is cost justified was referred by the Board to the PUC and referred back by the PUC's letter of April 8, 2009 (Exhibit EFSB-5.) In the Preliminary Order, the EFSB indicated an intention to examine not only the cost of the Project but also to compare the cost of the Project to the cost of reasonable alternatives to the Project.

The estimated Project costs were presented by National Grid in Section 4.9 and Table 4-2 of the ER. Subsequently Mr. Beron presented several revisions to the Project cost with the final being in Attachment DJB-2 to his rebuttal testimony of June 4, 2009 (Exhibit National Grid-14A). In this testimony, Mr. Beron testified that based on the Booth adjustments with which the Company agreed and several other adjustments, the revised estimated Project cost was \$246.9 million.

b. Alternatives to the Project – Introduction.

As part of its filing with the EFSB, National Grid provided a number of alternatives including the no-build alternative, electrical alternatives, transmission alternatives, overhead alternatives (route and configuration) and underground alternatives. ER Vol. 1, §5.0. In his prefiled testimony prepared for the PUC, Mr. Beron summarized these alternatives. Exhibit National Grid-7A. Several alternatives which did not address the needs of the Project were rejected for technical, not economic, reasons. Other alternatives were found to address Project needs, but at significantly higher cost, with significantly greater environmental impacts, and/or with operational issues that made them less suitable as a solution. These alternatives were rejected for these reasons.

c. No Build and Electrical Alternatives.

Several alternatives were discussed in detail by Mr. Stevens in his prefiled testimony. Exhibit National Grid-7B. After reviewing the need for the Project, Mr. Stevens testified that “the no-build alternative would mean that National Grid would be unable to meet the identified system needs and therefore is not an acceptable alternative.” Stevens, p. 14.

In addition to the Project as proposed, Mr. Stevens examined two other transmission alternatives: (i) a new 345 kV transmission line from Brayton Point Substation to Kent County Substation, and (ii) two new 115 kV underground transmission lines from Franklin Square Substation to Sockanosset Substation. Stevens, p. 7. Mr. Stevens testified that the first alternative would require significant upgrades to avoid overloading 345/115 kV transformers and components of the 115 kV transmission system in western Rhode Island. He concluded “clearly this alternative becomes impractical and unrealistic due to the large number and scale of new facilities required.” Stevens, p. 10. Mr. Stevens testified that the second transmission alternative listed above would strengthen the 115 kV transmission system but does not resolve issues during N-1-1 conditions. Stevens, p. 11. He listed several rounds of additional upgrades and system improvements that would be required to make this alternative feasible. He testified that even with the additional upgrades “this alternative is not on par with the proposed plan. It is essentially a shorter term, stop gap type of solution. It does not provide the future capacity, flexibility or expandability that the proposed plan does, and it does not provide strong bulk transmission access and support to this heavily loaded area.” Stevens, p. 13. In conclusion he testified that only the Project as proposed “fully addressed the needs and reliability concerns of the Rhode Island area transmission system in a reasonable fashion.” Stevens, p. 14.

d. Non-transmission Alternatives.

Non-transmission alternatives (NTAs) to the Project were considered in the assessment prepared by ICF International (Appendix F to the ER), in the prefiled testimony of Kenneth K. Collison (Exhibit National Grid-7C), and in the prefiled testimony of Mark Stevens. Exhibit National Grid-7B. Mr. Collison explained that a non-transmission alternative is “a resource that could possibly be used as a substitute for a transmission project including both generation and demand side resources.” Collison, p. 7. He offered examples including energy efficiency measures, demand response, distributed generation or central generation stations. The NTA options considered by ICF in its analysis included “combined heat and power (‘CHP’) resources, demand side management (‘DSM’) resources and central generation stations.” Collison, p. 7.

In its analysis, ICF considered three NTA scenarios including uniform load reduction in Rhode Island, load reduction at key points, and uniform load reduction in Connecticut and Rhode Island. Under the first scenario, ICF determined that approximately 1500 megawatt (MW) of demand reduction would be required to resolve the overload issue. Mr. Collison noted that this represents more than 50% of Rhode Island’s peak load and, as such, is unrealistic. The second scenario would require the elimination of all demand served by the Drumrock, Kent County and Johnston Substations together with another 1000 MW in load reduction across the rest of the state. This again was considered by ICF to be an unrealistic level of load reduction. Finally, under the third scenario, a reduction of 1000 MW in Connecticut and a similar amount in Rhode Island would be required to resolve the overloads. This reduction represented approximately 40% of Rhode Island’s peak load and was also considered unrealistic. Collison, pp. 14-15. These demand reductions were incremental to the expected levels of non-transmission resources – CHP, DSM and generation resources – which had already been incorporated into the analysis. Collison, p. 10. Mr. Collison concluded that “the NTA options required to achieve reliability

benefits similar to that of RIRP are not realistic or reasonable . . . therefore no satisfactory NTA solutions are available for the RIRP Project.” Collison, p. 16.

e. Alternative Overhead Routes for the 345 kV Transmission Line.

National Grid considered two alternative overhead routes for the proposed 345 kV transmission line in addition to the proposed route. See ER Vol. 1, §5.4. The first was use of the Kent County to Sherman Road ROW, an undeveloped ROW owned by National Grid. The route is approximately 44 miles in length, or more than twice the length of the proposed route. However, National Grid determined that the cost of using the Kent County to Sherman Road route would be roughly equivalent because use of the existing corridor requires the relocation and reconstruction of the two existing 115 kV lines. National Grid concluded that extensive tree clearing would be required to develop the 44 mile ROW and the use of the alternative route would result in greater ground disturbance and potential wetlands impacts than the Project as proposed. Consequently, National Grid determined that the use of the existing developed ROW was preferable to use of the alternative.

National Grid also considered use of public streets and highways but determined that this alternative would require the acquisition of new ROW along existing roadways. It concluded that “since there is a viable alternative that could be delivered in a more timely manner with lower impacts and costs, this option was rejected.” ER Vol. 1, §5.4.2.

f. Overhead Alternatives Using the Existing ROW.

National Grid also examined several possible alternative configurations for the new transmission line on the existing ROW. ER Vol. 1, §5.5. The first was the use of H-frame structures instead of steel pole davit arm structures for the new 345 kV transmission line. The second configuration was double circuit structures for the proposed 345 kV line and one of the

existing 115 kV lines.<sup>6</sup> This configuration would expose the two lines to the potential of a double circuit failure.

After examining these overhead alternatives, National Grid concluded that the use of single circuit davit arm structures for the new 345 kV transmission line, as proposed, was preferable to either of the alternatives. Id.

g. Underground Alternative.

The final alternative that was considered by National Grid was an underground alternative. This alternative was presented in detail in the Environmental Report (ER Vol. 1, §5.6) and in the prefiled testimony of David Campilii, P.E. Exhibits National Grid-7E, 14E and 16B. Mr. Campilii testified that he had examined two alternative routes for an underground alternative: use of the existing overhead ROW and use of the public roadway network. Campilii, p. 3 (Exhibit National Grid-7E.) Because of the physical difficulty and environmental impacts of using the existing overhead ROW for an underground line, Mr. Campilii developed an underground alternative using existing public roads.

He also examined two underground technologies: high pressure fluid filled (HPFF) pipe type cables and solid dielectric cables. Campilii, p. 4. He testified to several operational and maintenance issues related to underground transmission lines as compared to overhead lines including a longer repair time (two weeks to a month or longer for underground as compared to 24 to 48 hours for overhead), difficulty in matching power ratings of an overhead line with underground cables, voltage control issues, the inability of an underground line to “reclose” as

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<sup>6</sup> National Grid explained that pairing either the two 345 kV lines or the two 115 kV lines on a common set of double circuit davit arm structures “would introduce the possibility of a common mode failure. Examples of common mode failure include a single event such as a lightning strike or a single transmission line fault which could cause both transmission lines on the structures to be interrupted.” ER Vol. 1, §5.5.2.



overhead lines do after a fault, and load sharing issues between an overhead line and a parallel underground cable. Campilii, pp. 4-5.

Mr. Campilii presented a cost estimate for the underground alternative which was revised in Attachment DJB-3 to Mr. Beron's prefiled testimony of June 4, 2009 (Exhibit National Grid-14A.) The comparison of the cost of the Project as proposed with the underground alternative is presented in Table 5-4 to the ER which was revised in Attachment DJB-4. This table indicates that the estimated cost of the overhead project is \$246.9 million and the cost of the underground alternative is \$445.3 million, or nearly \$200 million more than the Project as proposed.

The Division's witness, Gregory L. Booth, P.E., commented on Mr. Campilii's prefiled testimony regarding the underground alternative and expressed general agreement with Mr. Campilii's testimony. Booth, p. 31. He suggested however that because of the volatility in the cost of underground projects, the upper limit of the underground alternative could be higher than estimated by Mr. Campilii, or \$580 million. Booth, p. 34.

Mr. Booth testified that, following clarifications, his and National Grid's cost estimates for the Project "are virtually identical." Tr. 7/8/09, p. 55. He then addressed the underground cost estimate:

The same is generally true for the underground. Probably the biggest differential in my testimony is on the underground area. I do believe that the underground is going to cost more than the company is characterizing the cost of the underground would be, predominantly because of volatility in [particular] the materials in the underground sector, petroleum materials; that's probably the biggest differential. But even that is within the range of study grade estimates, even though that's the greatest differential between us.

Tr. 7/8/09, p. 56.

National Grid summarized its conclusions about the underground alternatives in the ER as follows:

Both the overhead and underground alternatives would meet the identified needs of the Project and would be expected to have high levels of reliability. The underground alternative has operational issues, longer restoration times, and voltage control issues. Generally, the underground alternative on the public roadway network would have fewer environmental impacts than the preferred overhead alternative. There would, however, be greater temporary impacts to the public during construction. The significantly higher cost and the operational issues make the underground alternative much less preferred than the overhead alternative.

ER Vol. 1, §5.6.7.

h. Conclusion – Cost and Alternatives to the Project.

Mr. Booth summarized his review of the alternatives proposed by National Grid in the following terms:

I have evaluated each [alternative] based upon its reasonableness, effect on the surrounding environment, and its ability to meet the needs cost effectively in a timely manner. Although as I have testified I do not fully concur with all of the National Grid assumptions, I do, at the end of my entire assessment, reach the same final conclusion that the proposed 345 kV transmission line is needed and represents the best and most cost effective solution for achieving the needed system improvements to sustain a reliable transmission system with the capability of transporting competitively priced power into the region, while also providing an integrated transmission solution for the New England East-West Solution.

Booth, p. 43.

He acknowledged that some of the alternatives examined by National Grid would address the problem. He continued:

However, [the alternatives] do not represent the best solution. Some appear to potentially have an even more adverse impact on the environment, particularly during the construction phase. Many of the alternatives, including the use of available right-of-way which is currently not being utilized would result in much more harm to the environment than the proposed Project. Also, there are overhead construction solutions that are more short term in nature that ultimately would not eliminate the need for the 345 kV transmission line, and would simply be a short term solution with a much more expensive total long term cost.

Booth, p. 44.

Mr. Booth confirmed the reasonableness of the Company's Project cost estimate during his testimony before the Board:

Initially, there were substantial differences or notable differences in my cost estimate in the overhead line and the cost estimate prepared by the company. I commented on that in detail. The company came back with rebuttal responding to that, clarifying some issues which I agree with their clarifications and making some cost changes that bring our two cost estimates within less than three percent of one another. Considering you look at a cost estimate like this, plus or minus 25 percent, for all practical purposes I think the cost estimates are virtually identical coming from two different views.

Tr. 7/8/09, p. 55.

Finally, he summarized his opinion as to the need for and reasonableness of the Project as follows:

. . . my testimony and conclusions would say that there is a definite need, that a no build option is not an option at all unless the state wanted to accept a very high risk of outage and outage to a substantial amount of the load. I do believe that the project as proposed offers the best and most economical solution of the alternatives reviewed including non-transmission alternatives and the underground alternative . . .

Tr. 7/8/09, pp. 56-57.

The Board finds Mr. Booth's testimony to be particularly persuasive and, based on it and the other testimony discussed above, determines that the Project is cost-justified. Of the alternatives presented by the parties, the Project as proposed by National Grid is the best alternative to meet the identified need.<sup>7</sup>

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<sup>7</sup> National Grid has proposed a reconfiguration in West Warwick (the "West Warwick alternative") which is discussed below; the Project that the Board is approving includes the West Warwick alternative.

2. Issue 2B – Will the Project comply with laws that would be applicable absent the Act?

The EFSB requested advisory opinions on this issue from 13 agencies and officials: the North Smithfield, Smithfield, Johnston, Cranston and West Warwick Zoning Boards of Review<sup>8</sup>, the North Smithfield, Smithfield, Johnston, Cranston, West Warwick and Warwick Building Inspectors, the Rhode Island Historical Preservation and Heritage Commission (RIHPHC), and the Rhode Island Department of Transportation (RIDOT). Preliminary Decision and Order, pp. 15-16.

The Cranston Zoning Board of Review approved the relief requested by National Grid under the Cranston Zoning Ordinance subject only to receipt by the EFSB of an EMF study from the Department of Health that is satisfactory to the EFSB. Cranston Zoning Board Notice of Decision, Exhibit EFSB-12. The Cranston Planning Board determined that the Comprehensive Plan does not address public utilities. It recommended approval subject to satisfaction of the other standards for the grant of variances and subject to submittal of an EMF study as noted above. Exhibit EFSB-12.

Similarly, the Smithfield Zoning Board of Review approved a special use permit for the Project in Smithfield subject to National Grid receiving final approval for the Project from the EFSB, Rhode Island Department of Environmental Management (DEM) and the U.S. Army Corps of Engineers, and approval pursuant to the Smithfield Soil Erosion and Sedimentation Control Ordinance. It also conditioned its approval on National Grid's agreement to provide

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<sup>8</sup> In the Preliminary Decision and Order, the Board also requested advisory opinions from the planning boards of North Smithfield, Smithfield, Johnston, Cranston, West Warwick and Warwick as to whether the Project would be a land use consistent with the municipalities' comprehensive plan. Because planning boards often act in an advisory capacity to the municipal zoning board, the decisions will be treated together in this section.

vegetative screening to any abutter who requests such screening, subject to approval by the Smithfield Town Engineer. Exhibit EFSB-13, pp. 3-4.

In its advisory opinion to the Board, RIDOT advised that the Project will require a utility permit for any work on or over state road rights-of-way. RIDOT Letter dated February 18, 2009, Exhibit EFSB-6. National Grid proposes to treat these permits as post-licensing permits under Rule 1.14 of the EFSB Rules.

The Johnston and West Warwick Zoning and Planning Boards recommended rejection of the Project. The Johnston Zoning and Planning Boards (the Johnston Boards) conducted a series of joint hearings and issued a joint decision. Exhibit EFSB-16. Subsequently, National Grid and Johnston filed a Settlement Stipulation on June 29, 2010. Pursuant to the Settlement Stipulation, Johnston withdrew its advisory opinion and its objection to the Project.

The West Warwick Zoning and Planning Boards each issued two separate advisory opinions on the Project, one dealing with National Grid's request for a Special Use Permit for the Project and a second for a Dimensional Variance from the height restrictions of the West Warwick Zoning Ordinance. National Grid argued that the Board should reject the decisions of the West Warwick Zoning and Planning Boards as not meeting the minimum standards for decisions specified by the Rhode Island Supreme Court.

In the Zoning Board decisions, the Zoning Board makes very few findings of fact (seven short paragraphs that address concerns about the impact on property values, fear of adverse health effects from EMF, and the alternative of placing the transmission line underground). The only expert testimony before the Board was provided by witnesses on behalf of National Grid. The Board received statements from members of the public and from town officials but received no expert testimony contrary to the evidence presented by National Grid.

National Grid cites Rhode Island law for the principles that a zoning board (i) may not base its decision on lay testimony, and (ii) may not ignore uncontradicted expert testimony. The Rhode Island Supreme Court has held that a zoning board may not rely on lay testimony in determining a matter before it:

The lay judgments of neighboring property owners on the issue of the effect of the proposed use on neighborhood property values and traffic conditions had no probative force in respect of an application to the zoning board of review for a special exception. Smith v. Zoning Board of Review of Warwick, 103 R.I. 328, 334, 237 A2d 551, 54 (1968).

Toohey v. Kilday, 415 A.2d 732, 737 (R.I. 1980); see also Salve Regina College v. Zoning Board of Review, 594 A.2d 878, 881 (R.I. 1991) in which the Supreme Court rejected testimony from a neighboring property owner “who was altogether vehemently opposed to any further student habitation in his own neighborhood” but had been recognized by the Newport Zoning Board as an expert on traffic matters.

The Rhode Island Supreme Court has also held that “if expert testimony before a zoning board is competent, uncontradicted, and unimpeached, it would be an abuse of discretion for a zoning board to reject such testimony.” Murphy v. Zoning Bd. of Review of South Kingstown, 959 A.2d 535, 542 (R.I. 2008) (citation omitted). Thus, in Murphy, the Court overturned a zoning board decision that rejected undisputed expert testimony. Id. at 542-543.

The wording of the Planning Board’s decisions is identical until the conclusions of law which recite the statutory standards for the relief which National Grid sought. Similarly, the Zoning Board’s decisions make identical findings of fact and are followed by two different sets of conclusions of law which merely recite the standards for the relief which National Grid sought.

The Board acknowledges that the Rhode Island Supreme Court has held that in deciding applications before it, any municipal board “must set forth in its decision findings of fact and

reasons for the actions taken,” which must be “factual rather than conclusional, and the application of the legal principles must be something more than the recital of a litany.” Kaveny v. Cumberland Zoning Bd. of Review, 875 A.2d 1, 8 (R.I. 2005) (citing, *inter alia*, Sciacca v. Caruso, 769 A.2d 578, 585 (R.I. 2001)). Furthermore, those are “minimal requirements” necessary to enable proper review of a board’s decision. Zammarelli v. Beattie, 459 A.2d 951, 953 (R.I. 1983) (citations omitted).

While the Board will not rule on National Grid’s request that the West Warwick Zoning Board advisory opinions be rejected for the reasons explained above, we acknowledge that a conclusory advisory opinion is of little value to the Board as it reviews an application. For this reason, we will, in future cases, hold zoning and planning boards to the standard enumerated by the Supreme Court in the Kaveny case.<sup>9</sup>

The Warwick Planning Board reviewed the Project and determined that it was not consistent with the Warwick Comprehensive Plan. The memorandum from the Director of the Planning Department provided comments on specific figures contained in Volume II of the ER and was critical of the fact that the Project “does not provide appropriate screening and buffers from the various residential and commercial developments and recreational facilities in Warwick.” Exhibit EFSB-10. The final two pages of the Planning Department memorandum review various aspects of the Comprehensive Plan with which the Project is not consistent.

In her prefiled testimony of June 29, 2009 (Exhibit National Grid-16C), Ms. Moberg noted that this determination appeared to be based on a feeling that the Project was incompatible with adjacent land uses. However, it ignored the fact that the ROW has been used for transmission lines for many years. Ms. Moberg noted that the planning board’s advisory opinion

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<sup>9</sup> As described below, National Grid has developed a reconfiguration of the Project in the vicinity of the Carrie Ann and Gilcrest Drive neighborhoods of West Warwick which has addressed the visual issue in that area.

“did not address the many ways that the Project supports the goals of the Comprehensive Plan in terms of providing reliable electricity service to residents and existing business as well as providing robust electric service as an attractant for new businesses looking for potential development sites.” Moberg (6/29/09), p. 11.

In addition, the Planning Board’s decision does not cite any provisions of the Comprehensive Plan dealing with public utility infrastructure or use of existing electric transmission ROWs. National Grid argues that the lack of any such provision in the Comprehensive Plan would seem to be consistent with a provision of the Warwick Zoning Ordinance which exempts electric transmission lines and other utility infrastructure from the requirements of the Ordinance. A note which precedes Table 1 of the Zoning Ordinance states:

The provisions of this ordinance shall not be construed so as to limit or interfere with the construction, installation, operation and maintenance for public utility purposes of water and gas pipes, mains, conduits, electric light and electric power transmission and distribution lines, telephone lines, cable television lines, oil pipe lines, sewer mains, and incidental appurtenances and installations.

National Grid has requested that the Board grant a waiver from the determinations of the West Warwick Zoning and Planning Boards and the Warwick Planning Board.

3. Issue 2C – Would a waiver from certain laws be justified?

The Act authorizes the Board to grant a waiver from the requirements of laws, regulations and ordinances which, in the absence of the Act, would apply to a project. The standard for grant of a waiver is that “public health, safety, welfare, security and need for the proposed facility justifies [the] waiver.” R.I. Gen. Laws, §42-98-11(b)(2). In making a decision to grant a waiver from one or more such laws or regulations, the Board is guided by the General Assembly’s legislative findings in the Act. In particular, the General Assembly recognized that “the authority to regulate many aspects of the issues involved in the siting of major energy facilities currently exists in a variety of agencies within the government of the State and the



political subdivisions of the State; . . . that there is overlapping jurisdiction among several State agencies and that there is the potential for conflicting decisions being issued by the various agencies having authority over the different aspects of the siting of a major energy facility.” R.I. Gen. Laws, §42-98-1(b). In this instance, there is jurisdiction over various aspects of the Project by a number of planning and zoning boards and, as the General Assembly had predicted, there have been conflicting decisions with several zoning and planning boards approving the Project while the West Warwick Zoning and Planning Boards and the Warwick Planning Board rejected the Project.<sup>10</sup>

National Grid has requested that the Board examine the overall benefits of the Project to the State as discussed under Issue 1, above, and determine that the need for the Project justifies a waiver of the requirements of the respective ordinances and comprehensive plans.

National Grid notes that Board precedent from previous cases supports granting National Grid’s waiver requests. In the Board’s 1994 proceeding in the Kent County to Old Baptist Road 115kV Transmission Line proceeding, the East Greenwich Zoning Board had provided a negative advisory opinion. The Board explained in its decision that the East Greenwich Zoning Board had expressed

concerns about adverse health effects from EMF exposure, negative impacts on property values and quality of life, potential danger from unauthorized access to the right-of-way, negative noise impact due to additional clearing, visual pollution, incompatibility relative to the existing residential community and school, and concerns regarding erosion and sedimentation.

In re The Narragansett Electric Company (Kent County to Old Baptist Road Transmission Line), Docket No. SB-93-1, Decision and Order, p. 24 (Order No. 25, September 23, 1994.)

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<sup>10</sup> The Johnston Zoning and Planning Boards also issued advisory opinions that were adverse to the Project. However, by the terms of a settlement stipulation between National Grid and Johnston which we have approved, the advisory opinions have been withdrawn.

The Board ruled that, given its finding as to need for the line, a waiver from the provisions of the East Greenwich zoning ordinance was justified. Id., pp. 24-25.

Subsequently, in the Board's 2007 Final Decision and Order in National Grid's Southern Rhode Island Transmission Project, the Board determined, based on the need for the Southern Rhode Island Transmission Project, that a waiver of the requirements of the North Kingstown Zoning Ordinance was justified and should be granted. In re The Narragansett Electric Company (Southern Rhode Island Transmission Project), Docket No. SB-2005-01, Decision and Order, p. 20 (Order No. 59, March 13, 2007.)

It is clear from the discussion under Issue 1 that all parties agree there is a vital need for the Project and the Board has so found. It is also clear that maintaining a reliable supply of electricity is vital to the public health, safety, welfare and security. As a result, the grant of a waiver from the requirements of the West Warwick zoning ordinance and the West Warwick and Warwick Comprehensive Plans is justified and is hereby granted.

C. Issue 3 – Will the proposed Project cause unacceptable harm to the environment?

In its Preliminary Order, the Board characterized this issue as being at the heart of its analysis of the overall impact of the Project. Preliminary Order, p. 12.<sup>11</sup> It stated that it would consider "all reasonable alternatives to the various components to the Project" in determining the impact of the Project to the environment. Id.

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<sup>11</sup> The Act gives the EFSB authority over all licenses, permits, assents and variances required for a major energy facility except for DEM authority under the freshwater wetlands act and pursuant to delegated federal authority. R.I. Gen. Laws §42-98-7(a). National Grid advised that it has applied for and will continue to pursue a DEM permit under the freshwater wetlands act. See Beron supplemental prefiled (4/27/10), pp. 3-4 (Exhibit National Grid-34) where National Grid requested expedited treatment of its freshwater wetlands permit application from DEM pursuant to §42-98-10(e).

## 1. Natural and Social Environments.

National Grid provided an extensive analysis of the environmental impact of the Project in its ER, including a description of the natural and social environments that would be affected by the Project (Sections 6.0 and 7.0), an analysis of the impacts of the Project on those environments (Section 8.0), and a description of design, construction and post-construction mitigation measures (Section 9.0). Susan Moberg of VHB summarized the environmental conditions of the Project area and the potential environmental impacts that would result from the construction and operation of the Project.

In her testimony, Ms. Moberg described the geology, soils, water resources, vegetation, wetlands and wildlife of the Project site which she defined in her testimony as the existing transmission ROW and the West Farnum and Kent County Substations. After summarizing the conditions, she described the impact analysis which VHB had performed (Moberg, pp. 5-6) and then summarized the potential impacts of the Project on vegetation, soils, wildlife, wetlands, water resources, and noise. Moberg, pp. 6-9. She noted in her testimony that the visual impact of the Project has been assessed by EDR and the impact on cultural resources has been addressed by The Public Archaeology Laboratory (PAL) and in Mr. Beron's testimony. Ms. Moberg testified that VHB has prepared an erosion and sediment control plan as part of the DEM wetlands application and in compliance with municipal ordinances. Id. p. 10. Finally, Ms. Moberg expressed the opinion that the Project "will not cause unacceptable harm to the environment." She explained:

National Grid has proposed responsive mitigation measures to control short-term construction impacts. The Project will not cause long-term impacts to natural and human resources given the location of the line in an existing utility ROW.

Moberg, p. 11.

## 2. Visual Impact Assessment (VIA)

At the request of National Grid, EDR prepared a visual impact assessment to analyze the potential visibility and visual impact of the Project. The VIA, which was Appendix C to the ER, “included viewshed analysis, line-of-sight cross-sections, field evaluations, computer-assisted visual simulations and the evaluation of the project’s visual impact by a panel of landscape architects.” ER Vol. 1, § 8.10.

In prefiled testimony, representatives of EDR explained that as a result of the analyses conducted in the visual impact assessment, they concluded that “the proposed project will result in a limited increase in visibility when compared to the visibility of the existing transmission lines. However, it is likely to have an effect on the visual/aesthetic character of some near foreground views within the study area.” EDR prefiled testimony, p. 11 (Exhibit National Grid-16D.)

EDR explained with the following specific conclusions:

- Topographic viewshed analysis indicates that the area of potential visibility for the proposed 345 kV structures total approximately 5% more than that of the existing 345 kV structures within the 1-mile radius study area.
- Vegetation viewshed analysis, which considers the screening effect of mapped forest vegetation, indicates that only 29% of the study area should have potential views of the proposed 345 kV structures.
- Line-of-sight cross section analysis indicates that existing vegetation, structures and topography will be effective in screening views of the proposed 345 kV structures from most areas within and adjacent to the study area (including visually sensitive sites). Visibility along selected lines of sight was typically restricted to very limited areas, generally directly adjacent to the existing transmission corridor.
- Field review confirmed the results of the cross-section analysis and revealed that views of the existing lines are largely restricted to road crossings, open lawns/fields and some newer residential subdivisions within 1,000 feet of the existing transmission corridor.

- Visual simulations of the Project show an increase in scale, visual weight and skyline clutter with the proposed Project components in place. However, these changes do not typically result in a significant increase in visual contrast or reduction in the original level of scenic quality, due to the presence of the existing transmission lines. The largest impact occurs in those instances where the effectiveness of foreground screening is reduced due to the height of the proposed structures or where tree removal will occur at the southern end of the right-of-way (ROW).
- The visual contrast ratings conducted by a panel of landscape architects indicated that adverse visual impacts of the proposed Project should generally be minimal to moderate. This is largely attributable to the occurrence of the Project within an existing transmission corridor, and hence the lower scenic quality of the existing views and limited visual contrast with the existing landscape. The perceived impact to land use was most notable in views that included the presence of residential structures or evidence of residential or recreational use.

Id.

EDR made the following recommendations:

- In selected locations where lack of existing foreground vegetation increases the visibility of the proposed and/or existing lines, the feasibility of screen plantings should be evaluated. Evergreen plantings were suggested by the panel in their evaluation of several of the simulations. Screen plantings have the greatest mitigation value in off-ROW situations where the line is proximate to viewers, opportunities for plantings exist, and these plantings have the potential to grow tall enough to fully screen the transmission line structures. Plantings would also be beneficial where close-range views of the bases of the proposed structures or open views of the cleared ROW could be effectively screened. However, plantings on the ROW (e.g., at road crossings) would have to be evaluated in terms of their compatibility with ROW maintenance/line clearance requirements. Even if allowable, such on-ROW plantings would have limited screening value, as they would have to utilize relatively low growing species.
- The rating panel also suggested that the new transmission structures would appear more orderly and unified, if they could be consolidated (i.e., combining two single circuit lines on a double circuit structure) or consistent in style/design (e.g., all H-frames or all with identical davit arm configurations). However, according to National Grid, combining the existing single circuit lines on double circuit structures would not meet electrical reliability planning criteria, and therefore would not be allowed. National Grid also indicated that unifying the style of the new structures, to either match the existing H-frame structures or consistently use davit arms on alternate sides of the towers, could not be accomplished within the confines of the existing cleared ROW. Acquiring and clearing additional ROW to pursue this alternative would likely have additional visual impacts that would offset or exceed any aesthetic benefits achieved.

Id., p. 13.

David Beron addressed these recommendations in his supplemental prefiled testimony of June 29, 2009. Exhibit National Grid-16A. He noted that National Grid has conducted an extensive community outreach effort which includes discussion of the feasibility of off-ROW screen plantings with abutters who have transmission line structures adjacent to their property. He explained, as discussed above, that it is not possible to combine the 115 kV lines on a double circuit davit arm structure because of the negative impact on the reliability of the lines as described in ER Vol. 1, § 5.5.2. Beron (June 29, 2009), p. 10. Finally he noted that the alternative of expanding the ROW in order to use H-frame structures had been considered. ER Vol. 1, §5.5.1. He noted that in addition to increased visual impacts, this would likely have additional land-use impacts and be disruptive to abutters. Beron (June 29, 2009), p. 11.

During the EFSB's July 14, 2009 hearing, Mr. Hecklau addressed comments related to the visual impact assessment rating forms for Viewpoint 117, Gilcrest Drive in West Warwick. Mr. Hecklau confirmed that all three of the rating panel members were critical of the impact of the project from that viewpoint and explained:

[Viewpoint 117] did elicit some fairly negative comments [from the panel.] But overall in looking at the subset of 11 simulations that we picked out to represent the visual characteristics within the study area, the average reaction was much more modest in terms of the project's contrast with the existing conditions. And in looking, again, at the panel's comments, most of that seems to be attributable to the fact that the existing condition in almost all cases includes the existing transmission lines which very often have a significant effect on either the existing scenic quality or the character of the view. So from an overall perspective our conclusion is that the incremental increase in contrast to visual impact was relatively modest.

Tr. 7/14/09, p. 137.

Mr. Hecklau was examined at some length by Commissioner Flynn as to the impact of the project on residents of Gilcrest Drive as represented by Viewpoint 117. Tr. 7/14/09, p. 139 et seq. As discussed below, National Grid has developed an alternative which will result in the new

345 kV transmission line being located away from the Gilcrest and Carrie Ann Drive area in West Warwick, on the west side of the ROW.

### 3. Electric and Magnetic Fields (EMF)

The EFSB Rules require that an applicant seeking a license in connection with the construction or modification of transmission lines provide “a review of the current independent scientific research pertaining to electromagnetic fields (EMF) and . . . data on the anticipated levels of EMF exposure and potential health risks associated with this exposure.” EFSB Rule 1.6(b)(12).

National Grid provided information on electromagnetic fields in 7.8 of the ER (Description of Affected Social Environment) and in Section 8.16 (Impact Analysis.) In addition, it included as Appendix B to the ER a paper entitled “Electric and Magnetic Field Research Update: Rhode Island Reliability Project” (2008) prepared by Exponent.

In his prefiled testimony, Dr. William Bailey of Exponent described electric and magnetic fields and the sources thereof and presented calculations of electric and magnetic field levels under existing conditions and after construction of the Project. Dr. Bailey described three of the recommendations made by the World Health Organization in its 2007 report:

- Provided that the health, social and economic benefits of electric power are not compromised, implementing very low-cost precautionary procedures to reduce exposures is reasonable and warranted.
- Policy-makers and community planners should implement very low-cost measures when constructing new facilities and designing new equipment including appliances.
- Changes to engineering practice to reduce ELF exposure from equipment or devices should be considered, provided that they yield other additional benefits, such as greater safety, or involve little or no cost (WHO, 2007b, p. 372).

Bailey, p. 14, Exhibit National Grid-16E.

Dr. Bailey confirmed that National Grid's design of the Project to minimize the potential for increased EMF exposure was consistent with these recommendations:

National Grid has proposed to construct the 345-kV line at the center of an existing right-of-way, which increases the distance to the edge of the right-of-way and reduces the possibility of measuring higher EMF in new areas. National Grid has also proposed to optimize the phasing configuration of the new 345-kV and rebuilt 115-kV lines so as to minimize the fields outside the right-of-way by promoting the mutual cancellation of fields from all of the lines.

Id.

In the Preliminary Order, the Board requested the Rhode Island Department of Health (DOH) to provide an advisory opinion "on the potential public health concerns related to biological responses to power frequency electric and magnetic fields associated with the operation of the Project." Preliminary Order, p. 17. In particular the Board requested that DOH review and comment on the Exponent report. By letter dated December 15, 2009, the DOH provided a brief response and included the following recommendations and guidance:

- DOH characterized the Exponent report as containing an extensive "although not necessarily exhaustive" review of the relevant literature on the subject which provides "an appropriate summary of the recommendations contained in this peer-reviewed literature."
- DOH acknowledged that Rhode Island had not established standards regarding maximum field levels at the edge of a ROW but noted that "the projected magnetic field intensities at the edge of the right-of-way for the RI Reliability Project all appear to be [well] within any enforceable standard that would be applicable in either Florida or New York, as well as the current European Union (EU)/International Commission on Non-Ionizing Radiation Protection (ICNIRP) guideline."
- "The Exponent report provides detailed technical evaluations of several controversial issues . . . . [However] technical evaluations may not be adequate to address the risk communication challenges that affect public perception of risk."

Exhibit EFSB-17.

Subsequently, the Board sought additional guidance on the issue of electric and magnetic fields and engaged Kenneth R. Foster, Ph.D., P.E., to review Dr. Bailey's report and testimony. Dr. Foster presented an extensive review of the Exponent report, Dr. Bailey's testimony, and the



existing and projected EMF levels along the Project ROW. Dr. Foster summarized his findings in the following language:

The evidence and testimony presented by National Grid, in particular the testimony of Dr. Bailey, are consistent (in fact heavily rely on) reports of the World Health Organization (WHO) and other health agencies and are technically accurate descriptions of the scientific evidence as it stands at present. Despite some differences in emphasis, the conclusions of Dr. Bailey are consistent with statements of WHO and other major health agencies.

I conclude that the materials presented by National Grid and its consultants (a) shows that the project will result in only marginal changes in levels of public exposure to powerline fields, and (b) correctly describes the opinion of WHO that scientific evidence at present does not support the conclusion that exposures to powerline fields at levels below international guidelines can cause adverse health effects, despite raising some level of concern. I am aware of no recent advisories by WHO and other major health agencies that indicate a change in these agencies' longstanding recommendations on the issue.

Exhibit EFSB-21.

During the Board's deliberations on this case at the opening meeting on June 29, Dr. Sullivan suggested that National Grid should perform a longitudinal study of the health effects of EMF exposure along the ROW.

After discussion, the Board continued the open meeting to give National Grid an opportunity to respond to Dr. Sullivan's proposal. On July 8, 2010, National Grid filed a report from Dr. Bailey on the issue. Dr. Bailey explained the criteria that a health study should meet and suggested that

The best source of information about the possible health effects of EMF exposure is the large body of existing research on this topic, rather than a small study of a restricted geographic area.

"Discussion of Rhode Island Longitudinal EMF Health Study", pp. 1-2 (Exponent 2010) (Exhibit National Grid-40.)

Dr. Bailey also reviewed the ongoing research into EMF and health effects and advised that National Grid has budgeted \$1.2 million this year to support this research. In response to a

question from Dr. Sullivan, National Grid confirmed that the results of this research are typically published in peer-reviewed scientific and engineering journals as it is completed. Dr. Sullivan agreed to withdraw his request for a study on the condition that National Grid provide the Board with an annual update as to studies funded by National Grid which were published in the prior year. National Grid has agreed to this condition.

#### 4. West Warwick Position on Alternatives

The major issue raised by the West Warwick Zoning and Planning Boards and repeated by individuals in statements to the EFSB<sup>12</sup> was a request that National Grid be directed to either (i) put a portion of the new transmission line underground in West Warwick or (ii) construct the new line on National Grid's 44 mile undeveloped right-of-way between the Kent County Substation and the Sherman Road Substation. See, e.g., Statement of Kenneth Morin, Tr. 10/19/09, p. 166.

##### a. Use of Undeveloped Kent County-Sherman Road Right-of-Way.

As noted previously, National Grid holds an undeveloped 44 mile ROW between the Kent County Substation in Warwick and the Sherman Road Substation in Burrillville. National Grid examined this alternative in its Environmental Report (ER Vol. 1, § 5.4.1) and, although it determined that the cost would be comparable to the cost of the Project as proposed, it rejected the alternative because of the potential impacts on the natural and social environments. In particular, National Grid noted that this alternative would result in the clearing of approximately 800 acres of forested land and the construction of an access road along the ROW for construction and maintenance of the new transmission line. The comparative impacts were further refined in

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<sup>12</sup> Although representatives and residents of the Town of West Warwick made statements to the EFSB both during the evening hearing in West Warwick on July 8, 2009 and during the final hearings, the Town never intervened in the proceedings.

National Grid's Response to EFSB Record Request No. 4: "Approximately 7 ½ acres of clearing would be required for the Project as proposed. If National Grid were to use the alternative [Kent County to Sherman Road] overhead route, approximately 780 acres of clearing would be required." National Grid Response to EFSB Record Request No. 4, Exhibit EFSB-15.<sup>13</sup>

b. Underground "Dip" in West Warwick.

The request from West Warwick officials and residents and the determination of both the West Warwick Zoning and Planning Boards was that the new line should be constructed underground through West Warwick. Exhibits EFSB-8 and 9. Thus at the Board's October 19, 2009 hearing, West Warwick resident Kenneth Morin acknowledged that burying the entire line would be cost prohibitive but argued "to bury the [line] through that small half-mile area of the Carrie Ann/Gilcrest Drive [neighborhood] in West Warwick where the neighborhood is impacted so badly, it does seem doable." Tr. 10/19/09, p. 166.

The discussion of the underground alternative in the ER did not consider the possibility of a short underground "dip" in an overhead transmission line. ER Vol. 1, § 5.6. In his June 29, 2009 prefiled testimony, David Campilii addressed the option of constructing a short segment of an otherwise overhead transmission line underground. Mr. Campilii distinguished a high voltage transmission line from low voltage distribution lines which are frequently installed underground (Campilii (6/29/09), p. 1; Exhibit National Grid-16B) and explained that in order to do such an installation it would be necessary to construct a transition station at each end of the underground segment. The transition station

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<sup>13</sup> National Grid argues in its memorandum of June 18, 2010 that because of the notice requirements under the Act and the Rhode Island Administrative Procedures Act (R.I. Gen. Laws, § 42-35-1 et seq.), if the Board were to decide that this alternate route were preferable to the proposed route, National Grid would be required to develop a new application for the alternative route and, once the application was prepared, refile its case with the EFSB, thereby restarting the 15 to 18 month EFSB review process. Given the Board's decision on this Project, this point is moot.

provides a means to connect the overhead line to the underground cables. The transition station also provides space for additional equipment (switches, circuit breakers, protective relaying equipment, etc.) required to operate the overall 'hybrid' overhead/underground system. These transition stations have the appearance of an electrical substation.

Id., p. 2.

Mr. Campilii testified that each transition station would require a fenced area of approximately one acre and would cost approximately \$4.5 million for a 345 kV system, exclusive of the cost of the land for the transition station. Mr. Campilii estimated that the cost of a half mile dip in a 345 kV overhead line would be \$20 million and the cost of a one mile dip would be \$28 million. Id., p. 4. He noted that the latter number represents approximately 4 times the \$7.2 million per mile for the overhead system as proposed. Id., p. 5.<sup>14</sup>

Finally, he explained that National Grid expects the cost of the Rhode Island Reliability Project to be spread across ratepayers in New England. However, a requirement that a segment of the Project be placed underground would likely result in the cost of such underground being imposed on either the ratepayers in the municipality that required the underground, or on ratepayers in Rhode Island as a whole. Id., p. 6.

During his July 8, 2009 testimony, Division witness Gregory Booth commented on Mr. Campilii's criticism of underground dips and added his own:

I agree with him. I think he has taken maybe a more even keeled opinion of an underground dip on transmission than I would have. I find them to be not only very expensive and difficult to achieve, particularly at the higher voltages you wind up with very adverse impact associated with the two termination points. My experience has shown that generally the public finds them much more aesthetically detrimental than the overhead line if you didn't have underground dips, if you have short dips because you wind up putting in big stations.

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<sup>14</sup> The statement is made in the West Warwick Zoning Board's advisory opinion that the cost of placing a short segment of the new line underground in West Warwick was approximately \$2 million.

My experience with transmission underground dips has not been particularly pleasant because generally what happens is underground for the most part is fairly susceptible to lightning damage. I won't get into all the engineering details, but when you have lightning hit overhead lines and you have underground, you get what's called return wave, you actually get a doubling of the adverse impact from underground at these dip points, so you wind up with a greater likelihood of the underground cable failing when you put in short dips.

So I don't – I've used them, I've done them, I've done them in municipal areas. They're expensive. You can accomplish them but personally from an engineering standpoint, design/operation standpoint, I think they impose a much greater risk on the system than the value you achieve from them.

Tr. 7/8/09, pp. 58-59.

Subsequently he described the appearance of a typical transition station for a 345 kV underground dip:

A typical one is made up of numerous large structures, tall structures which dead end the transmission line. You have arrestors, capacitors, sometimes you have other protective equipment, you've got multiple structures to bring the underground in and adequately protect the underground from lightning in particular, so at this voltage you wind up with a big footprint, a lot of steel structures involved on the site.

Tr. 7/8/09, p. 60.

##### 5. The West Warwick Alternative.

During the EFSB hearing on October 19, after statements by two West Warwick representatives, Commissioner Flynn questioned Mr. Beron about the possibility of expanding the ROW in the vicinity of the Carrie Ann Drive and Gilcrest Drive neighborhood and shifting the construction to the west side of the ROW, away from the neighborhoods. Tr. 10/19/09, pp. 171-174.

Subsequently, in additional supplemental prefiled testimony, Mr. Beron explained that National Grid had been able to negotiate an option to purchase an additional 60 foot width on the western edge of the existing ROW in this area. This would allow National Grid to reconfigure the lines from approximately the Cranston-West Warwick town boundary to the vicinity of

Wakefield Street by constructing the new 345 kV line on the west edge of the existing ROW and leaving the existing lines in essentially their present configuration. Beron (April 27, 2010), pp. 1-2, Exhibit National Grid-34. Mr. Beron explained that this reconfiguration would require new transition structures to go from vertical to horizontal configurations in the vicinity of Wakefield Street and in the vicinity of the Cranston-West Warwick town boundary and that although it may be necessary to rebuild some of the 115 kV structures, their configuration and location would remain essentially the same. *Id.*, p. 2. Mr. Beron also presented a wetland impact summary table for the alternative route compared to the original route (Attachment DJB-16.) He testified that the alternative will require tree clearing in wetlands which results “in a permanent conversion from forested to shrub wetland cover type” and although there will be greater temporary impacts, the impacts “do not represent a significant increase in permanent fill . . . in wetlands.” *Id.*, p. 3. Mr. Beron noted that the alternative would complicate the permitting (DEM Wetlands) and construction of the Project but that, subject to EFSB approval, National Grid planned to use the West Warwick alternative.

On May 20, 2010, Mr. Beron responded to a question from the Board’s counsel as to the reaction of the West Warwick citizens to the alternative:

The Board may recall that I believe at the last hearing several residents made an appearance and comment, Mr. Pezza and Mr. Morin in particular, and they’ve been some of the key contacts that we’ve been in touch with really during the whole duration of the project since we originally kicked it off. But once we had done due diligence and assured ourselves that we had an alternative design that could work and we were able to sign a purchase and sales agreement with the property owner, we did sit down in particular with Mr. Morin and Mr. Pezza to describe what the proposal was, and I don’t want to speak for them, but . . . it’s fair to say that it was a very positive meeting and they seemed quite satisfied with the alternative proposal.

Tr. 5/20/10, p. 23.

## 6. Construction Schedule

In his June 29, 2009 supplemental prefiled testimony, David Beron addressed the suggestion from Eugenia Marks of the Audubon Society of Rhode Island at the public hearing in North Smithfield that construction be restricted during bird-breeding season (April 15 through July 15.) He explained that because of the need to take the existing 115 kV transmission lines out of service to construct the new lines, the sequence and timing of Project construction is very complicated. The outages are available generally only in the spring and fall timeframes, and imposing additional restrictions would make it increasingly difficult to accomplish the Project in a timely manner. Beron (6/29/09) p. 11.

In her prefiled testimony, Susan Moberg addressed the potential impacts of construction of the Project on wildlife, including birds. Ms. Moberg testified:

Breeding birds utilize the cleared transmission ROW and adjacent habitats for nesting, cover, and feeding. Construction of the Project will mostly occur in existing cleared ROW and will not result in large changes to existing vegetation cover types that might result in long term impacts to existing avian populations. Construction will occur over several years. Construction activities on individual transmission line towers and foundations occur in discrete areas and may involve some localized negative effects on avian breeding success for areas proximate to the structure sites. Activities will not occur across the entire ROW simultaneously and at any given time during the construction period most of the transmission line ROW will remain undisturbed and continue to provide nesting habitat.

Moberg p. 7.

Mr. Beron addressed the issue of construction timing in more detail in his supplemental prefiled testimony of April 27, 2010 and during his testimony on May 20, 2010 (See Tr. 5/20/10, pp. 14-21.) He explained that if one of the two existing 115 kV transmission lines were out of service as part of Project construction and the other line experienced a problem, “the entire supply to many National Grid substations and customers [in Rhode Island] could potentially be interrupted.” As a result the work must be planned in such a way that it can be done during

periods of reduced load. Because National Grid's electrical system in Rhode Island has both summer and winter peaks, the "most productive construction windows are spring (March through June) and fall (September through November.)" Beron (April 27, 2010), p. 5. Mr. Beron presented two attachments to his prefiled testimony: a one line diagram showing the substations that are interconnected with the 115 kV and 345 kV transmission lines, and a preliminary outage plan showing the segmentation, sequencing, and planning of construction around spring and fall outage windows (Attachment DJB-18 and 19.)

He explained the former during his May 20, 2010 testimony:

[The S-171 and T-172 115 kV lines] originate out of the Woonsocket Substation and then they tap into the Farnum Pike Substation, Wolf Hill Substation, Putnam Pike Substation in Smithfield, the Hartford Avenue Substation is a location where there's actually a breaker or circuit breakers in the lines, and then they additionally tap into the Johnston Substation, the substation at the FPL RISE generator plant and the West Cranston Substation ultimately terminating at the Drumrock Substation.

So in particular with regard to Farnum Pike, Wolf Hill and Putnam Pike, Johnston and West Cranston, those five in particular, you see they rely solely on those existing 115 kv lines as their supply. So as we perform the work to rebuild and reconfigure those 115 kv lines, we need to be careful to perform it in a carefully planned manner, but also a way that maintains dual supply to the extent practical to all those substations so we do it in a segmented manner. We would work – for example, the section of one of the lines from Woonsocket to just north of Farnum Pike, we'd have that section out so that Farnum Pike would still have two lines feeding it. It would have the S-171 line from either Woonsocket or Hartford Ave. being able to supply it and the remaining section of T-172 as an example from the south, from Hartford Ave. supplying it.

So again, we carefully plan the sequence of construction to minimize any reliability exposures that would result from the construction and that, again, does extend the overall construction period.

Tr. 5/20/10, pp. 19-21.

National Grid has urged the Board to decline to impose any time-of-year restrictions on construction of the Project. In support, it has cited the complexity of the construction of the Rhode Island Reliability Project, the restriction on construction during



peak load periods as explained by Mr. Beron, and Ms. Moberg's testimony regarding the minimal potential impacts on birds. Based on the above, the Board will not impose any such limitations on the Project.

## 7. Conclusion.

National Grid examined both of the alternatives urged by West Warwick officials and residents: use of the undeveloped Kent County to Sherman Road ROW for an overhead 345 kV transmission line or constructing an underground "dip" in the vicinity of the Carrie Ann and Gilcrest Drive area in West Warwick. The Board agrees with National Grid that neither of these options is a viable alternative for the reasons discussed in detail above. The development of the Kent County to Sherman Road ROW would require clearing and constructing of a road network on a 44 mile ROW through western Rhode Island. The underground dip would create significant operational issues for National Grid as explained by Mr. Campilli and, equally important, would impose a significant additional cost on ratepayers in Rhode Island. At the urging of Commissioner Flynn, National Grid has developed and proposed an alternative that will result in the reconfiguration of the lines on the right-of-way in the vicinity of these neighborhoods and a reduction in the visual impact of the Project.

Mr. Beron testified that Messrs. Morin and Pezza who had spoken against the Project at the end of the Board's October 19, 2009 hearing were satisfied with the alternative which National Grid has proposed. Counsel for the West Warwick Zoning and Planning Boards, Albert DiFiore, Esq., advised the Board during the May 20, 2010 hearing that he had spoken to Messrs. Morin and Pezza after they met with Mr. Beron and that they were not in attendance at the May 20 hearing. Tr. 5/20/10, p. 29. National Grid urges that the implication of his statement was that if they had been dissatisfied, they would have been at the hearing to express their opinions.

The Board also has before it extensive evidence from Dr. Bailey on the issue of EMF. Dr. Bailey's report was confirmed by the DOH and subsequently by Dr. Foster. Dr. Bailey's supplemental report (Exhibit National Grid-40) addressed the issue of a longitudinal health study in Rhode Island. As an alternative to the study, National Grid has agreed to provide annual updates as to published studies which it has supported. Finally, the testimony of Ms. Moberg regarding environmental resources and impacts was uncontroverted. Based on the evidence before it, the Board determines that the Project, which includes the West Warwick alternative, will not cause unacceptable harm to the environment.

D. Issue 4 – Will the proposed facility enhance the socioeconomic fabric of the State?

The Board requested an advisory opinion from the Statewide Planning Program and the State Planning Council "as to the impact of construction and operation of the Project upon the socioeconomic fabric of the State." It requested that the opinion include "economic and reliability benefits to the local population and economy, employment benefits, and tax benefits to the towns and the state." Preliminary Order, p. 13.

In its advisory opinion, the Statewide Planning Program acknowledged a number of benefits of the Project in discussing its conformance with the State Guide Plan:

- a. [The Project] improves the reliability of an existing transmission system that is reaching the limits of its ability to accommodate current service demands and is susceptible to significant overloads, unacceptable voltages, and large scale blackouts due to lack of redundancy in transmission capacity.
- b. [The Project] bolsters economic and industrial growth initiatives while ensuring adequate public safety service provision in times of emergency.
- c. [The Project] minimizes potential land use conflicts by placing improvements within an existing corridor that already contains significant transmission facilities and is primarily located within the Urban Services Boundary established by *Land Use 2025*.

d. [The Project] will not result in long-term negative impacts to drinking water supplies, groundwater, upland surface waters, or the waters of Narragansett Bay.

Statewide Planning Advisory Opinion, Exhibit EFSB-11, p. 11.

The Statewide Planning Program determined that the Project will have positive local and regional economic benefits including increased municipal tax revenues without imposing additional service obligations on the towns. It also determined that temporary employment during construction will “have positive economic spinoffs within the applicable communities, the State of Rhode Island and the region as a whole.” *Id.* It noted that there would be temporary negative impacts resulting from construction (wetlands, stormwater quality, potential highway travel restrictions and increased noise) together with the permanent visual impact of the Project resulting from the increased height and number of transmission structures. *Id.*, pp. 11-12. The Statewide Planning Program recommended a number of measures including seeking design alternatives to minimize the visual impact of the Project<sup>15</sup>, the use of mitigation measures to reduce environmental impacts (wetlands and floodwater storage, stormwater and erosion, and noise), the use of appropriate police details in connection with construction over roadways, and investigation and mitigation of impacts to cultural resources through coordination with the RIHPHC. *Id.*, p. 12.

In his prefiled testimony of June 29, 2009 (Exhibit National Grid-16A), Mr. Beron addressed the recommendations from the Statewide Planning Program. He testified that the design of the line is subject to the requirements of the National Electrical Safety Code and involves a balance between the number of structures and the height of the structures. He also

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<sup>15</sup> As discussed previously, National Grid has proposed an alternative configuration for the new 345 kV line in the Gilcrest Drive area of West Warwick which was one of the areas cited by the Statewide Planning Program in discussing the aesthetics of the Project. *Id.*, pp. 5-7.

explained that one of National Grid's goals in designing the Project was to line up new and relocated structures with the structures of the existing 345 kV line "to reduce the visual clutter or 'picket fence' effect on the ROW." *Id.*, p. 8. He explained that, as testified to by Mr. Campilli, burial of short segments of the new line is not a feasible alternative. *Id.* Mr. Beron testified that National Grid was proposing compensation for wetlands filling and would submit soil erosion and sediment control plans. He confirmed National Grid's intent to comply with local noise ordinances and to provide police traffic details as required. He also explained that the Company is investigating cultural resources and will coordinate with RIHPHC. Finally, as discussed in Section V-C-5, above, in his April 27, 2010 prefiled testimony, Mr. Beron presented an alternative configuration for the new 345 kV line in the Carrie Ann and Gilcrest Drive area of West Warwick. Beron (April 27, 2010), pp. 1-3.

Based on the advisory opinion of the Statewide Planning Program and Mr. Beron's testimony, the Board finds that the Project will enhance the socioeconomic fabric of the State.

E. Issue 5 – Is the construction and operation of the Project consistent with the State Guide Plan?

The EFSB also asked Statewide Planning to provide an advisory opinion on the consistency of the Project with the State Guide Plan. Preliminary Order, p. 13.

After conducting a rigorous analysis of the Project, the Statewide Planning Program issued an advisory opinion stating that it found the Project to be consistent "with 21 out of the Plan's 29 individual elements" of the State Guide Plan. Statewide Planning Program Advisory Opinion, Exhibit EFSB 11, p. 10. It noted that the other eight elements were determined not to be directly applicable to the Project and concluded that "substantial inconsistencies were not identified." *Id.* Based on this advisory opinion, the Board finds that the Project is consistent with the State Guide Plan.

F. Johnston – National Grid Settlement Stipulation

On June 29, 2010, Johnston and National Grid filed a Settlement Stipulation, a copy of which is attached hereto as Exhibit A. Pursuant to the Settlement Stipulation:

(i) National Grid and Johnston agreed to impose ten conditions on the construction of the Project in Johnston;

(ii) Johnston withdrew the “proposed limiting conditions” which had been attached to the Johnston Zoning and Planning Board’s advisory opinion;

(iii) Johnston withdrew its objection to the Project and also withdrew its advisory opinion and brief.

The Settlement Stipulation is subject to Board approval. The Board finds that the Settlement Stipulation is a reasonable resolution of the issues between Johnston and National Grid and we hereby approve it.

VI. **CONCLUSION**

The Board has conducted an exhaustive review of National Grid’s proposal with the able assistance of the numerous designated state and local agencies. The Board heard extensive testimony from many witnesses who addressed all aspects of the Project.

Based on our review of the record and our findings of fact, discussed above, we reach the following conclusion of law.

First, as to need for the Project, its cost justification and alternatives:

There was no disagreement about the need for the Project in order for National Grid to continue to provide reliable service to its customers in Rhode Island. National Grid conducted an extensive examination of alternatives to the Project ranging from non-transmission alternatives, electrical alternatives, physical alternatives (configuration on the right-of-way and underground) and alternate routes. The inescapable conclusion of these analyses is that the

Project as proposed by National Grid is the most reasonable alternative. This was confirmed by ISO-NE and by the Division's witness Booth who concluded his prefiled testimony with the following statement:

It is unacceptable to allow a realistic transmission outage risk to jeopardize electric service to 90,000 or more customers when the proposed Project is the lowest cost solution with the least harm that can be implemented in a timely manner.

Booth, p. 45.

Thus the Board concludes that the Project is cost-justified and can be expected to transmit energy at the lowest reasonable cost to the consumer consistent with the objection of ensuring that the construction and operation of the line will be accomplished in compliance with all applicable requirements, except as noted below.

Second, as to the waivers which National Grid has requested from the determinations of the West Warwick Zoning and Planning Boards and the Warwick Planning Board:

Considerations of the public health, safety, welfare, security and need for the Project, as discussed in detail above, justify a waiver from the provisions of the West Warwick zoning ordinance and the West Warwick and Warwick Comprehensive Plans and the determinations of the West Warwick Zoning and Planning Boards and the Warwick Planning Board. The Board hereby grants the requested waivers.

Third, with respect to the impact of the Project on the environment:

Based on the testimony of the witnesses and other evidence as discussed above, the Board finds that the Project, which includes the West Warwick alternative, will not cause unacceptable harm to the environment.

Fourth, as to the impact of the Project on the socioeconomic fabric of the State and its consistency with the State Guide Plan:

Based on the advisory opinion of the State Planning Council and the other evidence presented, the Board finds that the Project will enhance the socioeconomic fabric of the State and is consistent with the State Guide Plan.

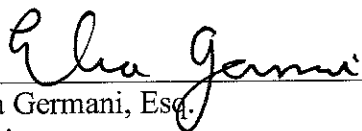
Accordingly, it is hereby

**(Order No. 65) ORDERED:**

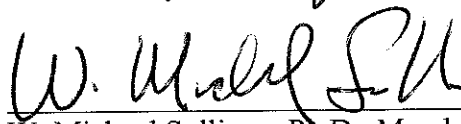
That the application of The Narragansett Electric Company d/b/a National Grid for a license to construct the Rhode Island Reliability Project as described herein is hereby granted, and the license so granted shall constitute a granting of all permits, licenses, variances or assents subject to the jurisdiction of the Board, which under any law, rule, regulation or ordinance of the State or of a political subdivision thereof would, absent the Energy Facility Siting Act, be required for the construction of the Project; provided, however, that the license granted hereby shall be subject to and comply with all the conditions and requirements as described in this Order.

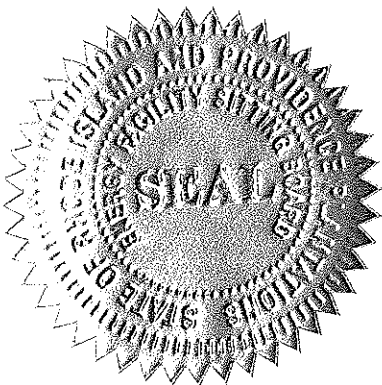
DATED AND EFFECTIVE AT WARWICK, RHODE ISLAND ON AUGUST 12,  
2010 PURSUANT TO AN OPEN MEETING DECISION ON JULY 14, 2010.

ENERGY FACILITY SITING BOARD

  
\_\_\_\_\_  
Elia Germani, Esq.  
Chairman

  
\_\_\_\_\_  
Kevin M. Flynn, Member

  
\_\_\_\_\_  
W. Michael Sullivan, Ph.D., Member



**NOTICE OF RIGHT OF APPEAL** PURSUANT TO R.I.G.L. SECTION 42-98-12, ANY PERSON AGGRIEVED BY A DECISION OF THE BOARD MAY, WITHIN TEN (10) DAYS OF THE ISSUANCE OF THIS ORDER PETITION THE SUPREME COURT FOR A WRIT OF CERTIORARI TO REVIEW THE LEGALITY AND REASONABLENESS OF THIS ORDER.



**EXHIBIT A**

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
ENERGY FACILITY SITING BOARD**

In re The Narragansett Electric Company :  
d/b/a National Grid : Docket No. SB-2008-02  
(Rhode Island Reliability Project) :

**SETTLEMENT STIPULATION**

This Settlement Stipulation is entered into and jointly submitted by The Narragansett Electric Company d/b/a National Grid ("National Grid") and the Town of Johnston ("Town") (collectively the "Parties") to the Energy Facility Siting Board ("EFSB" or "Board") for approval in the above proceeding under the following circumstances:

i. National Grid has submitted an application for license to construct and/or alter a major energy facility within the State of Rhode Island pursuant to the applicable provisions of R.I. Gen. Laws §§42-98-1 *et seq.* and the Board's Rules of Practice and Procedure, as amended (the "Board Rules").

ii. National Grid has requested the issuance by the Board of a license for the Rhode Island Reliability Project including the following components (collectively the "Project"):

- Two existing 115 kV transmission lines (S-171 and T-172) in National Grid's existing ROW between West Farnum Substation in North Smithfield and the vicinity of the Kent County Substation in Warwick will be relocated and reconstructed ( a distance of approximately 20.0 miles for each line).
- A new 345 kV transmission line (359 Line) will be constructed between the West Farnum Substation and the Kent County Substation in the space on the existing ROW created by relocation of the two existing 115 kV transmission lines (a distance of approximately 21.4 miles).
- Equipment will be installed at Kent County Substation in Warwick to accommodate the new 345 kV transmission line.
- Equipment will be installed at West Farnum Substation in North Smithfield to accommodate the new 345 kV transmission line.

- Sections of the existing S-171 and T-172 115 kV transmission lines between Hartford Avenue Substation in Johnston and the Johnston Tap Point will be reconducted coincident with the reconstruction of the lines (a distance of approximately 1.3 miles for each line).
  - The G-185N 115 kV transmission line will be reconducted from Kent County Substation to Drumrock Substation in Warwick (a distance of approximately 1.0 mile).
  - Short segments of the H-17 and B-23 115 kV transmission lines and the 332 and 315 345 kV transmission lines will be relocated in the vicinity of West Farnum Substation to accommodate the new 345 kV line and work within the substation.
  - Short segments of the L-190 and G-185S 115 kV transmission lines will be relocated to accommodate the equipment additions at the Kent County Substation (a distance of approximately 0.2 miles for each line).
- iii. The Town has intervened as a party and participated in the EFSB proceedings on the Project;
- iv. On September 4, 2009, the Johnston Zoning and Planning Boards (the "Town Boards") issued a joint advisory opinion to the EFSB ("Advisory Opinion") on the Project;
- v. In the Advisory Opinion, the Town Boards denied National Grid's application for a Special Use Permit and Dimensional and Use Variances for the Project;
- vi. The Town Boards recommended that the EFSB require that National Grid refile its application with the Town Boards to provide additional information;
- vii. The Town Boards provided a list of 20 "Proposed Limiting Conditions" with their Advisory Opinion and urged the EFSB to impose such conditions on National Grid if the EFSB granted National Grid's application;
- viii. On June 18, 2010, the Town filed its post-hearing brief ("Town Brief") in this matter with the EFSB; and
- ix. National Grid and Johnston have met and discussed the Project in an effort to resolve their differences.

In consideration of the mutual agreements contained herein and in the Settlement Agreement between National Grid and the Town, and other good and valuable consideration, the receipt of which is hereby acknowledged, the Parties agree as follows:

1. National Grid and Johnston agree to the following conditions related to the construction of that portion of the Project in Johnston:

- a. National Grid will designate an employee to act as an ombudsman to be contacted by Town residents and officials with any questions related to the Project or the ROW during construction of the Project.
- b. National Grid will obtain all necessary permits before starting construction of the Project.
- c. National Grid will provide to the Town copies of any future permit applications for town-related Project permits within Five (5) days of submittal of such permit applications.
- d. The Town Building Official and other approved Town representatives may inspect the Project site for conformance with permits issued by the Town of Johnston upon not less than Three (3) business days' notice, with a National Grid escort and subject to the use of appropriate personal protective equipment (PPE).
- e. National Grid will consult with the Johnston Director of Public Works in preparing traffic control plans for Project locations within Johnston.
- f. National Grid will e-mail Project construction updates every Two (2) weeks during the construction of the Project to Town officials and other interested residents of Johnston who provide a contact e-mail address.
- g. Noise will be mitigated during construction of the Project as described in ER, Section 8.11.4.
- h. National Grid will dispose of any solid waste or other debris generated as a result of the Project at approved disposal facilities.
- i. National Grid does not plan to install permanent lighting on the ROW in connection with the Project. Lighting is used in the event of night construction at a highway crossing, during emergency restoration of facilities and during extended construction hours. Any such work will be coordinated with appropriate state and town officials.
- j. National Grid shall provide the Town with copies of the "T-Sheets" for the ROW.

2. Except as specifically provided herein, the "Proposed Limiting Conditions" which were attached to the Advisory Opinion are hereby withdrawn.

3. The Town withdraws its objection before the EFSB to the Project and withdraws the Advisory Opinion and the Town Brief.

4. This Settlement Stipulation is the product of settlement negotiations. The substance of those negotiations is privileged and all offers of settlement shall be without prejudice to the position of any party.

5. This Settlement Stipulation shall be subject to approval by the EFSB. If the EFSB shall approve this Settlement Stipulation in its entirety or shall approve it on any condition or subject to any modification that is acceptable to the Parties, the Parties shall implement this Settlement Stipulation in accordance with its terms. If the EFSB should withhold approval of this Settlement Stipulation, or should condition its approval upon any condition or modification that is unacceptable to any of the Parties, the Settlement Stipulation shall be null and void and of no effect, and no Party shall cite it or use it for any purpose whatever.

6. Other than as expressly stated herein, this Settlement establishes no principles and shall not be deemed to foreclose any Party from making any contention in any other proceeding.

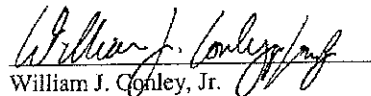
Respectfully submitted,

The Narragansett Electric Company  
d/b/a National Grid

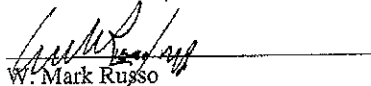


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