The Narragansett Electric Company

d/b/a National Grid (Interstate Reliability Project)

RIPUC Dkt. No. 4360

Joint Testimony of

Gabriel Gabremicael, P.E. and

Mark Stevens, P.E.

November 21, 2012

Q. Mr. Gabremicael, please state your name and business address.

A. My name is Gabriel Gabremicael. My business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

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

A. I am employed as a Manager of Transmission Planning – New England by National Grid USA Service Company, Inc. d/b/a National Grid ("National Grid") in the Transmission Planning Department.

Q. What are your responsibilities in that position?

A. I am responsible for transmission planning for National Grid in its New England service territory. Transmission Planning includes determination of need for reinforcement of the transmission system, evaluation of alternative solutions, and selection of the most satisfactory solution.

Q. Please describe your education, training and experience.

A. I graduated from Northeastern University in 1987 with a Bachelor of Science degree in Electrical Engineering. In 1991 I obtained a Master of Science degree in Electrical Engineering, with a concentration in Electric Power Systems, from Northeastern University. I have over twenty five years of experience in power system planning and analysis. I am also a Registered Professional Engineer in the Commonwealth of Massachusetts.

I have been working at National Grid for approximately twenty-six years. During this time, I have held engineering assignments in the Division Engineering, Relay and Control

Engineering, Operations Engineering, and the Transmission Planning Departments. I have been responsible for many transmission planning studies including studies relating to the Interstate Reliability Project (the "Project").

Q. Have you previously testified before the Massachusetts Energy Facility Siting Board or the Massachusetts Department of Public Utilities?

A. Yes I have testified in EFSB 97-3/D.P.U. 97-98/97-99 with regards to the need for the Dorchester-Quincy 115 kV underground cable and in D.P.U. 09-27/09-28 with regard to the need for a new 115 kV transmission line from the King Street Substation to the West Amesbury Substation.

Q. Mr. Stevens, please state your name and business address.

A. My name is Mark Stevens. My business address is 40 Sylvan Road, Waltham, Massachusetts 02451.

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

A. I am employed as a Lead Engineer by National Grid in the Transmission Planning Department.

Q. What are your responsibilities in that position?

A. I am responsible for transmission system planning for National Grid in its New England service territory.

Q. Please describe your education, training and experience.

A. I am a graduate of the University of Vermont, holding a Bachelor of Science degree in Electrical Engineering; I am also a graduate of Northeastern University, holding a Master

of Science degree in Electrical Engineering. I have nine years of experience in power system planning and analysis. I have been a Lead Engineer in the Transmission Planning Department since July of 2007; prior to that I was a Senior Engineer in the department since October of 2003. During this time, I have been responsible for many transmission planning studies related to the Interstate Reliability Project (the "Project"). From September 1995 to October 2003, I was employed as an electrical engineer in the Energy Management System group in the Dispatching Department at National Grid. I am also a Registered Professional Engineer in the Commonwealth of Massachusetts.

Q. Have you previously testified before public utility regulatory bodies in Massachusetts or Rhode Island?

A. Yes. I have presented testimony before the Massachusetts Department of Telecommunications and Energy in 2006 for an additional transmission tap line to the Whitins Pond Substation (located in Uxbridge, Massachusetts) from the R-144 transmission line . I also prepared prefiled testimony for submission to the Rhode Island Public Utilities Commission in Docket 4029, National Grid's Rhode Island Reliability Project. I did not testify because the Public Utilities Commission did not have a quorum. However, I sponsored the same testimony and testified before the Energy Facility Siting Board in the Rhode Island Reliability Project.

Q. Mr. Gabremicael and Mr. Stevens, are you familiar with the Interstate Reliability Project?

A. Yes, we are. In conjunction with other planners from National Grid and Northeast Utilities, we participated in the Southern New England Regional Working Group, led by

the Independent System Operator – New England ("ISO-NE"), which embarked on a coordinated series of studies to evaluate the reliability and performance of the electric transmission system serving Southern New England. The Interstate Reliability Project arose out of these studies. The studies are documented in the following reports which are included as appendices A through E and N and O of the Environmental Report:

- ISO-NE, Southern New England Transmission Reliability Report 1 – Needs Analysis (January 2008) [referred to as "2008 Needs Analysis"].
- ISO-NE, New England East-West Solution (Formerly Southern New England Transmission Reliability (SNETR)) Report 2, Options Analysis (June 2008) [referred to as "2008 Options Analysis"].
- CL&P, National Grid Solution Report for the Interstate Reliability Project (August 2008) [referred to as "2008 Solution Report"]
- ISO-NE, New England East-West Solution (NEEWS): Interstate Reliability Project Component Updated Needs Assessment (April 2011) [referred to as "2011 Needs Assessment"].
- ISO-NE, New England East-West Solution (NEEWS): Interstate Reliability Project Component Updated Solution Study Report (February 2012) [referred to as "2012 Solution Report"].
- ISO-NE, Follow-Up Analysis to the 2011 New England East-West Solution (NEEWS): Interstate Reliability Project Component Updated Needs Assessment [referred to as "2012 Follow-Up Needs Analysis"].

- ISO-NE, Follow-Up Analysis to the 2012 New England East-West Solution (NEEWS): Interstate Reliability Project Component Updated Solution Study Report (September, 2012) [referred to as "2012 Follow-Up Solution Report"].

Q. Mr. Gabremicael and Mr. Stevens, are you familiar with National Grid's Energy Facility Siting Board Application, including the ER prepared by AECOM for the Project?

A. Yes, we prepared the description of the need for the Project in the Environmental Report.

Q. What is the Interstate Reliability Project?

A. The Project is an expansion and reinforcement of the bulk transmission system in Rhode Island, Massachusetts and Connecticut, to comply with national and regional reliability standards and criteria, to alleviate overloaded lines and equipment, and to address potential voltage violations. The major components of the Project are new 345 kV transmission lines from the Millbury No. 3 Switching Station in Millbury, Massachusetts to the West Farnum Substation in North Smithfield, Rhode Island and from the West Farnum Substation to the Lake Road Switching Station and then to the Card Street Substation in Connecticut. The Project is a solution to problems identified in the New England East-West Solutions (NEEWS) Planning studies. These studies were conducted by a working group comprised of representatives of ISO-NE, National Grid and Northeast Utilities. We represented National Grid on the working group. The NEEWS Study was one of the most geographically comprehensive planning efforts to-date in New England since the construction of the original 345 kV network in the 1960's, addressing five interrelated problems in three states and multiple service territories. The analysis

was aimed at addressing the weaknesses of the transmission system in southern New England. NEEWS will benefit all of the New England states by addressing the issues of regional transmission system reliability and constrained generation.

Q. What is the scope of your testimony in this proceeding?

A. In our testimony, we will describe the transmission planning studies which have been conducted and address several alternatives which were examined as part of the process. A more detailed description is contained in Chapter 3.0 of the ER and in the studies listed above. We will also address how the need for the Project has been impacted by changes in the market and load forecasts that have occurred since the original studies were completed.

Q. Please describe the process by which National Grid determined that these transmission system improvements were necessary.

A. The need for reinforcement of the 345 kV transmission system in southern New England was first identified in the 2008 Needs Assessment. This analysis was subsequently updated by the 2011 Needs Analysis and ultimately by the 2012 Follow-up Needs Analysis. The 2011 and 2012 analyses are described in detail in Sections 3.3 and 3.4 of the ER. The assumptions, analyses, and results are described in detail in Sections 3.3 and 3.4 of the ER.

Q. What did you conclude as a result of these analyses?

A. The conclusion following the completion of the 2011 Needs Assessment was that the Project is necessary for transmission system reliability. Without the Project, the system

would experience thermal overloads and voltage performance issues under certain conditions and the inability to transfer power across southern New England. These conclusions were reaffirmed in the 2012 Follow-Up Needs Analysis and ISO-NE concluded that there is a continuing need to reinforce the 345 kV transmission system into Rhode Island (West Farnum Substation), increase transmission transfer capability from west to east and east to west in New England, and to increase the transmission transfer capability into Connecticut.

Q. Please describe the electrical alternatives to the Project that were considered by National Grid.

A. The Working Group identified five electrical alternatives that would resolve the reliability issues which had been identified. These alternatives were designated as options A-1, A-2, A-3, A-4 and C-2.1. (See, ER Sections 5.3 and 5.4). The four "A" options would connect the Millbury No. 3 Switching Station, the West Farnum Substation and/or the Sherman Road Switching Station, the Lake Road Switching Station, and the Card Street Substation. Option C-2.1 would connect Millbury to the Carpenter Hill Substation in Massachusetts and the Manchester Substation in Connecticut. These options are described in detail Section 5.3.2 through 5.3.6 of the ER and are evaluated in Sections 5.3.7 and 5.4 of the ER. The Working Group concluded that Option A-1 was the preferred solution for electrical performance, economics, and environmental impacts. The 2012 Follow-Up Solution Report confirmed the choice of Option A-1 as the preferred solution. (See, ER Section 5.10).

Q. What are the consequences of pursuing the "No-Build" option?

A. The proposed transmission system improvements are required to satisfy the transmission planning criteria and standards of National Grid, ISO-NE, NPCC, and NERC. Due to existing and projected electricity demand levels and existing system limitations, these planning criteria and standards require that the proposed transmission system improvements be completed in a timely manner to provide reliable electric supply to the area. Additionally, planning analysis has shown that contingency failures could lead to overloading of facilities and/or low system voltages throughout southern New England. 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.

Q. Please describe the non-transmission alternatives analysis.

A. The non-transmission alternative analysis was performed by ICF International for National Grid and Northeast Utilities and is described in detail in the report "Assessment of Non-Transmission Alternatives to the NEEWS Transmission Projects: Interstate Reliability Project (December 1, 2011)" (Appendix K to the ER) and in the prefiled testimony of Judah Rose from ICF. As part of its analysis, ICF has considered the addition of generation in the ISO-NE Generation Interconnections Queue, energy efficiency and demand response programs, and distributed generation. ICF concluded that the hypothetical non-transmission alternatives that would be necessary to relieve the identified thermal overloads and obviate the need for the Project would require

unprecedented levels of active demand resources and would cost between $15 billion and $44 billion.

Q. What is the conclusion of your analysis?

A. After examining the transmission and non-transmission alternatives, it was determined that the proposed alternative of new 345 kV transmission lines between the Millbury No. 3 Switching Station, the West Farnum Substation, the Lake Road Switching Station, and Card Street Substation best addressed the transmission system needs and reliability concerns identified by the Working Group.

Q. Does this complete your testimony?

A. Yes, it does.