BEFORE THE
RHODE ISLAND PUBLIC UTILITY COMMISSION

DOCKET NO. 4029

DIRECT TESTIMONY

OF

RICHARD S. HAHN

REGARDING NARRAGANSETT ELECTRIC COMPANY D/B/A NATIONAL GRID'S
APPLICATION TO CONSTRUCT AND ALTER MAJOR ENERGY FACILITIES

ON BEHALF OF THE

RHODE ISLAND DIVISION OF PUBLIC UTILITIES AND CARRIERS

April 8, 2009

INTRODUCTION

Q. Please identify yourself for the record.

A. My name is Richard S. Hahn. My business address is La Capra Associates, One Washington Mall, Boston, MA 02108. I am a Principal Consultant for La Capra Associates.

Q. Mr. Hahn, please summarize your experience and qualifications.

A. I have a BSEE and an MSEE in power systems engineering, and an MBA degree. I am a Registered Professional Engineer in Massachusetts. I have worked in the electric utility business for more than 30 years. From 1973 to 2003, I worked at NSTAR Electric & Gas (formerly Boston Edison Company). I have held many technical and managerial positions in both regulated and unregulated subsidiaries covering all aspects of utility planning, operations, regulatory activities, and finance. In 2004, I joined La Capra Associates. Since then, I have worked on projects related to resource planning, transmission, power procurement, generating asset valuations, analyzing market rules and prices, mergers, and litigation support. My resume is provided in Exhibit RSH-1.

Q. Have you previously prepared testimony before the Commission?

A. No. I have testified before regulatory commissions in other states, as described in Exhibit RSH-1.

Q. What has been your experience relative to review of load forecasts and proposed transmission facilities?

A. During my career at NSTAR, I was responsible for integrated resource planning and energy supply planning, and oversaw the development of short and long run forecasts for peak load and annual energy requirements. More recently at La Capra Associates, I have

overseen the development of load forecasts for many of our clients, on projects such integrated resource planning, market price forecasts, asset valuations, and transmission planning.

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

A. La Capra Associates, Inc. ("La Capra Associates") has been retained by the Rhode Island Division of Public Utilities and Carriers ("RIDPUC") to review and comment on the load forecast that is used in the needs analysis supporting the Rhode Island Reliability Project ("RIRP"), which is currently a proposed transmission project before the Energy Facilities Siting Board. This testimony presents the results of that review, and conclusions and recommendations.

Q. What role does a load forecast play in determining the need for transmission system improvements?

A. The load forecast is a critical component of the needs analysis because it determines the load level that needs to be met for any particular year or point in time. Changes in the load forecast can directly impact the timing, and even the necessity, of transmission system improvements. Load forecasts reflecting extreme weather conditions ("90/10 forecasts") are typically used to establish load conditions that are used to assess the transmission system under certain generation dispatch conditions and loss of transmission system elements.

Q. Have you reviewed the load forecast that was used in the Needs Analysis?

A. I have reviewed the load forecast used in the Needs Analysis as described in Mr. Steven's testimony. Though National Grid did not adequately explain the derivation of the load forecast, and I was unable to replicate the results using publicly available data or the

discovery responses provided by National Grid, the load forecast appears to be generally consistent with comparable forecasts. According to National Grid's response to DPUC 2-18, the load forecast found in the first row of the table on page 6 of Mr. Stevens' testimony is from the 2006 CELT 90/10 forecast for 2012. The table below compares these data to the data found in the 2006 CELT Report (p.8) and in the 2006 CELT Report "Forecasting Data" Spreadsheet and my calculation of the load pocket load using the proportional relationship between the loads in Rhode Island and in the load pocket.

	New England Load	State of Rhode Island Load	Load Pocket (47% of RI Load)
Load Level at which Needs Analysis was Performed (2012 Data)	32,648 MW	2,137 MW	1009 MW
CELT 2006 (2012 Data)	32,580 MW	2,185 MW	1032 MW

Q. Do you have any explanation for the differences between the forecast found in the 2006 CELT Report and the forecast provided in Mr. Stevens' testimony?

A. No, but it is possible that the needs analysis was conducted using a different load forecast or different assumptions due to references to other forecasts in National Grid's responses to data requests. First, the response to DPUC 2-1, states that the load forecast in the ISO-NE Needs Analysis (Appendix D of the Environmental Report, Volume 1) was used "to scale" the load levels used to create Table 3-1 of that report. As discussed in Appendix D, the ISO-NE used a 2005 vintage forecast but did not discuss reliability concerns in 2012 or 2014. Second, the response to DPUC 2-11 refers to the "2008 Power Supply Area Forecast" as the source of the 2014 90/10 loads used in the load flow runs. The

response to DPUC 2-17 further elaborates by stating that the load levels found in Mr. Stevens' testimony were derived from the load flow model. Hence, it is not completely clear which actual forecast was used to inform the conclusions regarding the contingency and needs analysis discussed in Mr. Stevens' testimony.

Q. Were there any other forecasts in National Grid's Filing?

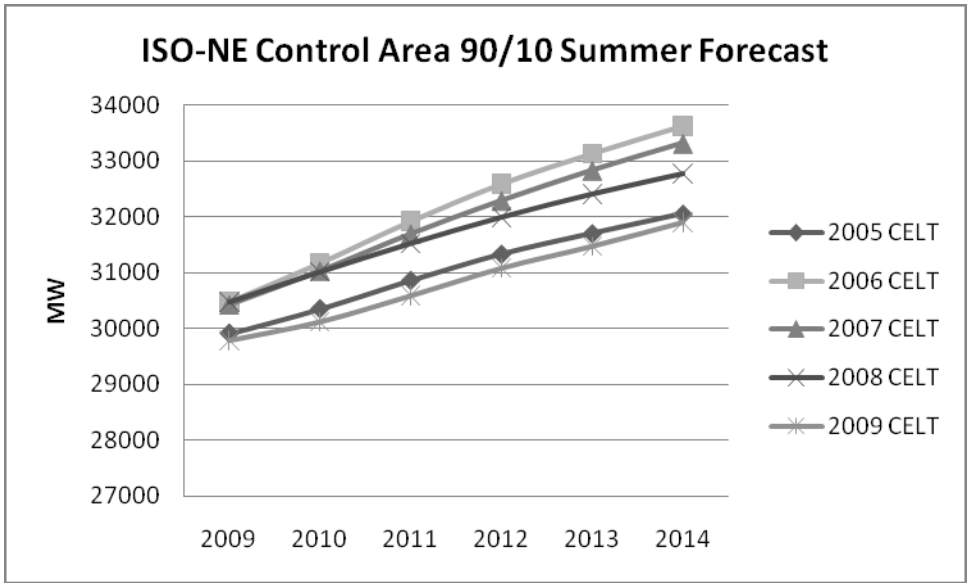
A. Yes. In addition to the three forecasts—2006 CELT, 2005 CELT, and the 2008 Power Supply Area Forecast—previously mentioned, a different forecast (and analysis year) was used in the Assessment of Non-Transmission Alternatives.

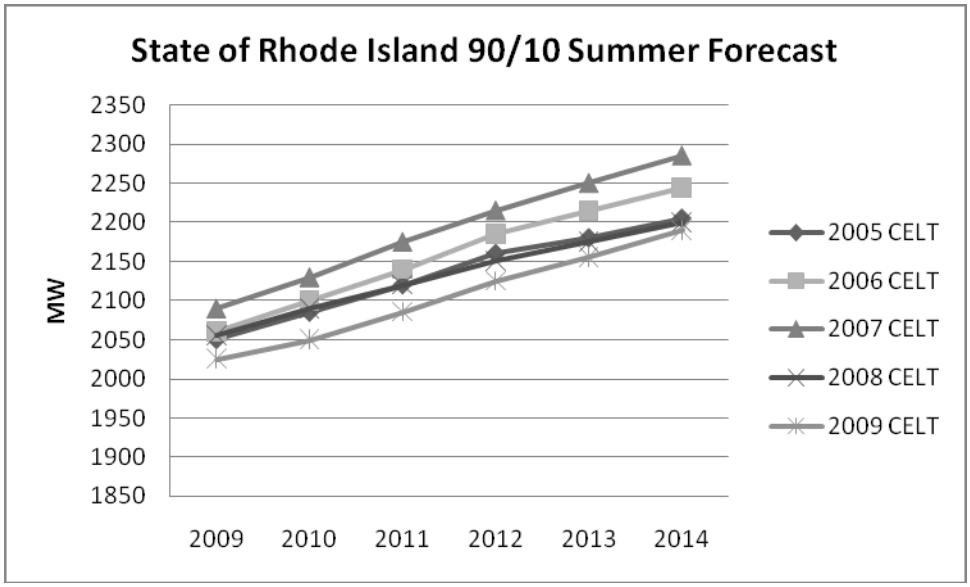
Q. Do you have any recommendations concerning the variety of load forecasts found in National Grid's filing?

A. Yes. I recommend that there be consistency in the load forecasts used for the needs analysis and non-transmission alternatives analysis. It would be best if National Grid's filing and the load flow runs underlying the need analysis used the same forecast.

Q. How have load forecasts changed over time?

A. The two figures below show the 90/10 Forecasts for the ISO-NE Control Area and the State of Rhode Island from the last five CELT forecasts for the years 2009-2014 (the years common to all forecasts). The data show that the most recent 2009 forecast represents the lowest of the past five annual forecasts.





Q. Does Mr. Stevens describe any possible adjustments to the forecast that was used in the needs analysis described in his testimony?

A. Yes. Mr. Stevens describes possible adjustments to the forecast in his testimony and in response to DPUC 2-19 and analyzes their potential impact outside of the load flow/contingency analysis. In addition to load-forecast adjustments, he also lists demand

resources and generating resource that apparently were not included in the Needs Analysis described in the filing. The impact of these adjustments is to reduce the load that would be used in the Needs Analysis for both the state of Rhode Island and the load pocket, but Mr. Stevens concludes that inclusion of these adjustments would not alter the need for the Rhode Island Reliability Project. Mr. Mezzanotte comes to a similar conclusion in his testimony. Presumably, Mr. Stevens and National Grid also concluded that due to the minimal impact on the load levels included in the Needs analysis underlying the filing, a new Needs Analysis would not alter any of the core conclusions described in Table 3-1 of the Environmental Report.

Q. Do you agree with the finding that conducting a new Needs Analysis that includes the potential adjustments described by Mr. Stevens is not necessary?

A. Assuming that the reduction of 45 MW described in National Grid's response to DPUC 2-19 is correct, I do agree that another Needs Analysis would not be necessary. However, I discuss additional adjustments below.

Q. Would you make any further adjustments to the load forecast presented in Mr. Stevens' testimony?

A. Yes. Though I believe that adjustments suggested in response to DPUC-19 are appropriate, other adjustments should be considered. My adjustments are shown in the table below.

	New England Load	State of Rhode Island Load	Load Pocket (47% of RI Load)
Load Level at which Needs Analysis was Performed (2012 Data)	32,648 MW	2,137 MW	1009 MW
Adjustments for 2009 CELT 2014 Forecast	*-875 MW (31,900 Forecast)*	*+53 MW (2,190 Forecast)*	*+25 MW (1,034 Forecast)*
Adjustment for new FCA2 generating resources			*-37 MW*
Adjustment for FCA2 existing and new demand resources		*-127 MW*	*-60 MW*
Total Net Adjustment			*-72 MW*

The first row replicates the first row in DPUC 2-19. The second row represents the adjustments due to changing the load year from 2012 to 2014 and utilizing the most up-to-date forecast from the Draft 2009 CELT Report that was released on March 24, 2009. The third row includes the adjustment for the Ridgewood generator but uses the FCA2 capacity supply obligation of 37 MW as the value. The last adjustment row shows the contributions of all demand resources from FCA2. According to the results available from the ISO website, over 186 MW of demand resources cleared in Rhode Island, with 126 MW of this total being active demand resources and 60 MW as passive resources. Removing the reserve margin gross-up adjustment of 16.1% that is used for demand resources and applying the availability factors of 69% and 100% for these two types of resources, respectively, yields a total of 60 MW. As shown in the draft 2009 CELT report, demand resources are counted as capacity resources and thus are no longer included in the CELT load forecasts. I used the proportional relationship between the State of Rhode Island load and the load pocket load to calculate the load pocket

adjustments for the new CELT forecast and FCA2 demand resource adjustments. The total adjustments to the load forecast are 72 MW, which is slightly lower than the 82 MW level that was part of Mr. Stevens' testimony.

Q. Do you feel the adjustments discussed above would obviate the need for Rhode Island Reliability Project as described by National Grid?

A. Based on the data currently available to me, I do not believe so, but the needs analysis should be conducted using the most recent load forecast available, including the most recent data concerning which demand resources will be available in order to make the need determination as strong as possible. Moreover, there have been a number of factors since the original Needs Analysis conducted by ISO-NE, which relied upon the 2005 CELT forecast, that support a fresh look at the Needs Analysis for the Rhode Island Reliability Project: (a) changes to the peak load forecast methodology used by ISO-NE, (b) recognition of demand resources as a capacity resource and thus removal of such resources from the load forecast, and (c) the development of the forward capacity market.

Q. Does this conclude your testimony?

A. At this time, yes it does. I reserve the right to amend or expand this testimony if additional information, such as responses to record requests, becomes available.

Exhibit RSH-1

Resume of Richard S. Hahn

La Capra Associates

Richard S. Hahn

Principal Consultant

Mr. Hahn is a senior executive in the energy industry, with diverse experience in both regulated and unregulated companies. He joined La Capra Associates in 2004. Mr. Hahn has a proven track record managing full P&Ls, integrated resource planning, analyzing energy, capacity, and ancillary services markets, valuation of energy assets, creating operational excellence, and developing start-ups. He has demonstrated expertise in electricity markets, utility planning and operations, sales and marketing, engineering, business development, and R&D. Mr. Hahn also has extensive knowledge and experience in both the energy and telecommunications industries. He has testified on numerous occasions before the Massachusetts Department of Telecommunications and Energy, and also before FERC.

SELECTED EXPERIENCE – *LA CAPRA ASSOCIATES*

- Performed a study of non-transmission alternatives (NTAs) to a proposed set of transmission upgrades to the bulk power supply system in Maine.
- Served as a key member of the La Capra Team advising the Connecticut Energy Advisory Board (CEAB) on a wide range of energy issues.
- Performed a study of non-transmission alternatives (NTAs) to a proposed set of transmission upgrades to the bulk power supply system in Vermont.
- Served as an advisor to the Delaware Public Service Commission and three other state agencies in the review of Delmarva Power & Light's integrated resource plan and the procurement of power supplies to meet SOS obligations.
- Served as an expert witness in litigation involving a contract dispute between the owner of a merchant powerplant and the purchasers of the output of the plant.
- Served as an advisor to the Maryland Attorney General's Office in the proposed merger between Constellation Energy and the FPL Group.
- Reviewed and analyzed outages for Connecticut utilities during the August 2006 heat wave. Prepared an assessment of utility filed reports and corrective actions.
- Conducted a study of required planning data and prepared forecasts of the key drivers of future power supply costs for public power systems in New England.
- Reviewed and analyzed Hawaiian Electric Company integrated resource plan and its DSM programs for the State of Hawaii. Prepared written statement of position and testified in panel discussions before the Hawaii Public Utility Commission.
- Assisted the Town of Hingham, MA in reviewing alternatives to improve wireless coverage within the Town and to leverage existing telecommunication assets of the Hingham Municipal Light Plant.

- Conducted an extensive study of distributed generation technologies, options, costs, and performance parameters for VELCO and CVPS.
- Analyzed and evaluated proposals for three substations in Connecticut. Prepared and issued RFPs to seek alternatives in accordance with state law.
- Performed an assessment of merger savings from the First Energy – GPU merger. Developed a rate mechanism to deliver the ratepayers share of those savings. Filed testimony before the PA PUC.
- Prepared long term price forecasts for energy and capacity in the ISO-NE control area for evaluating the acquisition of existing powerplants.
- Conducted an assessment of market power in PJM electricity markets as a result of the proposed merger between Exelon and PSEG. Developed a mitigation plan to alleviate potential exercise of market power. Filed testimony before the PA PUC.
- Performed a long-term locational installed capacity (LICAP) price forecast for the NYC zone of the NYISO control area for generating asset acquisition.
- Evaluated the implementation of an amended purchase power agreement between a large mid-west utility and a very large cogeneration plant. Audited compliance with very complex contract terms and operating procedures and practices.
- Performed asset valuation for energy investors targeting acquisition of major electric generating facility in New England. Prepared forecast of market prices for capacity and energy products. Presented overview of the market rules and operation of ISO-NE to investors.
- Assisted in the performance of an asset valuation of major fleet of coal-fired electric generating plants in New York. Prepared forecast of market prices for capacity and energy products. Analyzed cost and operations impacts of major environmental legislation and the effects on market prices and asset valuations.
- Conducted an analysis of the cost impact of two undersea electric cable outages within the NYISO control area for litigation support. Reviewed claims of cost impacts from loss of sales of transmission congestion contracts and replacement power costs.
- Reviewed technical studies of the operational and system impacts of major electric transmission upgrades in the state of Connecticut. Analysis including an assessment of harmonic resonance and type of cable construction to be deployed.
- Conducted a review of amendments to a purchased power agreement between an independent merchant generator and the host utility. Assessed the economic and reliability impacts and all contract terms for reasonableness.
- Assisted in the development of an energy strategy for a large Midwest manufacturing facility with on-site generation. Reviewed electric restructuring rules, electric rate availability, purchase & sale options, and operational capability to determine the least cost approach to maximizing the value of the on-site generation.
- Assisted in the review of the impact of a major transmission upgrade in Northern New England.

- Negotiated a new interconnection agreement for a large hotel in Northeastern Massachusetts.

SELECTED EXPERIENCE – *NSTAR ELECTRIC & GAS*

President & COO of NSTAR Unregulated Subsidiaries

Concurrently served as President and COO of three unregulated NSTAR subsidiaries: Advanced Energy Systems, Inc., NSTAR Steam Corporation, and NSTAR Communications, Inc.

Advanced Energy Systems, Inc.

- Responsible for all aspects of this unregulated business, a large merchant cogeneration facility in Eastern Massachusetts that sold electricity, steam, and chilled water. Duties included management, operations, finance and accounting, sales, and P&L responsibility.

NSTAR Steam Corporation

- Responsible for all aspects of this unregulated business, a district energy system in Eastern Massachusetts that sold steam for heating, cooling, and process loads. Duties included management, operations, finance and accounting, sales, and P&L responsibility.

NSTAR Communications, Inc.

- Responsible for all aspects of this unregulated business, a start-up provider of telecommunications services in Eastern Massachusetts. Duties included management, operations, finance and accounting, sales, and P&L responsibility.
- Established a joint venture with RCN to deliver a bundled package of voice, video, and data services to residential and business customers. Negotiated complex indefeasible-right-to-use and stock conversion agreements.
- Installed 2,800 miles of network in three years. Built capacity for 230,000 residential and 500 major enterprise customers.
- Testified before the Congress of the United States on increasing competition under the Telecommunications Act of 1996.

VP, Technology, Research, & Development, Boston Edison Company

- Responsible for identifying, evaluating, and deploying technological innovation at every level of the business.
- Reviewed Electric Power Research Institute (EPRI), national laboratories, vendor, and manufacturer R&D sources. Assessed state-of-the-art electro-technologies, from nuclear power plant operations to energy conservation.

VP of Marketing, Boston Edison Company

- Promoted and sold residential and commercial energy-efficiency products and customer service programs.
- Conducted market research to develop an energy-usage profile. Designed a variable time-of-use pricing structure, significantly reducing on-peak utilization for residential and commercial customers.
- Designed and marketed energy-efficiency programs.
- Established new distribution channels. Negotiated agreements with major contractors, retailers, and state and federal agencies to promote new energy-efficient electro-technologies.

Vice President, Energy Planning, Boston Edison Company

- Responsible for energy-usage forecasting, pricing, contract negotiations, and small power and cogeneration activities. Directed fuel and power purchases
- Implemented an integrated, least-cost resource planning process. Created Boston Edison's first state-approved long-range plan.
- Assessed non-traditional supply sources, developed conservation and load-management programs, and purchased from cogeneration and small power-production plants.
- Negotiated and administered over 200 transmission and purchased power contracts.
- Represented the company with external agencies. Served on the Power Planning Committee of the New England Power Pool.
- Testified before federal and state regulatory agencies.

EMPLOYMENT HISTORY

La Capra Associates, Inc. — Boston, MA
Managing Consultant — *2004 – present*

Advanced Energy Systems, Inc. — Boston, MA
President & COO — *2001-2003*

NSTAR Steam Corporation — Cambridge, MA
President & COO — *2001-2003*

NSTAR Communications, Inc.
President & COO — *1995-2003*

Boston Edison Company — Boston, MA
VP, Technology, Research, & Development — *1993-1995*
VP, Marketing, Boston Edison Company — *1991-1993*
Vice President, Energy Planning, Boston Edison Company — *1987-1991*
Manager, Supply & Demand Planning — *1984-1987*
Manager, Fuel Regulation & Performance — *1982-1984*
Assistant to Senior Vice President, Fossil Power Plants — *1981-1982*
Division Head, Information Resources — *1978-1981*
Senior Engineer, Information Resource Division — *1977-1978*
Assistant to VP, Steam Operations — *1976-1977*
Electrical Engineer, Research & Planning Department — *1973-1976*

EDUCATION

Boston College — Boston, MA
Masters in Business Administration — *1982*

Northeastern University — Boston, MA
Masters in Science, Electrical Engineering — *1974*

Northeastern University — Boston, MA
Bachelors in Science, Electrical Engineering — *1973*

PROFESSIONAL AFFILLIATIONS

Director, NSTAR Communications, Inc. — *1997-2003*
Director, Advanced Energy Systems, Inc. — *2001-2003*
Director, Neuco, Inc. — *2001-2003*
Director, United Telecom Council — *1999-2003*
Head, Business Development Division, United Telecom Council — *2000-2003*
Elected Commissioner – Reading Municipal Light Board — *2005-present*
Registered Professional Electrical Engineer in Massachusetts