The Narragansett Electric Company

d/b/a National Grid (Rhode Island Reliability Project)

RIPUC Dkt. No. 4029

Testimony of

Todd G. Kopoyan, P.E.

February 20, 2009

INTRODUCTION

Q. Please state your name and business address.

A. My name is Todd G. Kopoyan. My business address is 176 Worcester Providence Turnpike, Sutton, Massachusetts 01590.

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

A. I am employed by Energy Initiatives Group, LLC ("EIG") as a Principal Engineer.

Q. What is EIG?

A. EIG is an energy consulting company that provides project development, planning, strategy, execution, management, engineering, and operations consulting in the areas of electric transmission, generation, distribution, transportation, and renewable energy services. EIG is providing assistant project management services to National Grid on the Rhode Island Reliability Project ("the Project").

Q. Please describe your education, training and experience.

A. I have a Bachelor of Science Degree in Electrical Engineering from Northeastern University and a Master of Business Administration Degree from Babson College. I am a registered Professional Engineer in the State of Massachusetts. I have fourteen years of professional experience in the areas of engineering and project management of electric utility infrastructure projects. Prior to joining EIG, I worked for New England Power Service Company (a subsidiary of what is now National Grid) as a Substation Engineer for six years with general project management and engineering responsibilities for a variety of electric substation projects.

Q. Are you familiar with the Rhode Island Reliability Project?

A. Yes, I am an Assistant Project Manager for the substation components of the Project and am responsible for supporting project management in the engineering, design, licensing and other aspects of the substation components.

Q. What are your responsibilities as an Assistant Project Manager?

A. As an Assistant Project Manager I am responsible for supporting and reporting to the Project Manager on many aspects of the Project's substation components, including developing and gaining approval for substation project scope, cost estimation, project schedule, project budget and resourcing, compliance with environmental and safety standards and policies, project licensing and permitting, project communications, engineering and design, procurement, construction and commissioning of facilities.

SCOPE OF TESTIMONY

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

A. In my testimony, I will provide an overview of the West Farnum and Kent County Substation components of the Project including scope and schedule.

Q. Are you familiar with Narragansett's Energy Facility Siting Board Application dated September, 2008 for the Project, including the Environmental Report ("ER") prepared by Vanasse Hangen Brustlin, Inc. (VHB) and the visibility and visual impact assessment prepared by Environmental Design & Research, P.C. (EDR)?

A. Yes.

DESCRIPTION OF PROJECT

Q. Please describe the West Farnum Substation component of the Project.

A. The Rhode Island Reliability Project is a project which will expand and reinforce the existing transmission system in Rhode Island. National Grid proposes to construct a new 345 kV transmission line (359 Line) between West Farnum Substation in North Smithfield and Kent County Substation in Warwick. To accept the new 345 kV transmission line, the existing West Farnum and Kent County Substations will be expanded and modified.

Q. What is the relationship between the Rhode Island Reliability Project and the Interstate Reliability Project?

A. The Rhode Island Reliability Project and the Interstate Reliability Project ("IRP") both connect to the West Farnum Substation. Therefore, each Project's requirements were considered and incorporated into an ultimate plan for the substation layout. Separating the work at West Farnum Substation into two separate efforts cannot be done easily since there are components of the ultimate buildout which are common to both.

Q. What is the timing of the IRP?

A. National Grid anticipates filing an application with the Energy Facility Siting Board for the Interstate Reliability Project in the June, 2009 timeframe. The schedule calls for an in-service date for the IRP of late 2012.

Q. Please explain the proposed work at the West Farnum Substation?

A. The work at the West Farnum Substation includes the addition of the following:

- two bays of new 345 kV Gas Insulated Switchgear (GIS) consisting of six circuit breakers and associated disconnects and buswork;
- a new building to house the GIS;

- a new control house for the 345 kV relay and control equipment;
- a new 345 kV circuit breaker in the existing air insulated substation (AIS);
- two new transmission line termination structures; and
- upgrades to the existing 345 kV AIS bus.

The GIS will be connected to the existing air insulated substation to provide two 345 kV buses and four bays of 345 kV equipment consisting of eight 345 kV line/transformer positions. In addition the three existing 345 kV transmission lines and one existing autotransformer 345 kV connection will be reterminated. The need for the second bay of GIS, the circuit breaker in the AIS, the second line termination structure and the AIS bus upgrades were not initially identified as part of the Project. However, as engineering for the Project progressed, it was subsequently determined that these items should be included in the Project. As a result these items have been included in the revised version of § 4.3.7 of the ER (pp. 4-7 through 4-8), which is attached as Attachment TGK-1. Also attached (as Attachment TGK-2) is a revised version of Figure 4-10 from the ER which has been updated to show the Project components.

Q. Will your approach to the work at the West Farnum Substation change if the IRP is delayed?

A. As noted previously, the West Farnum Substation upgrade is being designed to accommodate both the Rhode Island Reliability Project and the Interstate Reliability Project or other additional 345 kV line connection which is needed at West Farnum to satisfy the North American Electric Reliability Corporation's (NERC), the Northeast Power Coordinating Council's (NPCC), and the ISO New England's reliability criteria

for the Rhode Island area. If a delay in the IRP were minor, the approach to the work at West Farnum may not be affected. However, if the IRP incurred significant delays, National Grid has a plan for an alternate approach which would allow interconnection of the new 345 kV line. This alternative would result in approximately $1.5 million in additional costs. These facilities would be removed at the time the ultimate plan is constructed.

Q. Please describe this alternate plan.

A. An alternative to constructing the eight-position scheme at this time is to expand the existing five-position station by adding a sixth breaker to create a position for the new line. Due to limited space, the existing control building would most likely require expansion to house the new protection and control equipment.

Q. What are the disadvantages of this alternative?

A. Beyond the additional $1.5 million cost, this approach would add complexity to the engineering, procurement and construction of the Project. It would also require additional 345 kV equipment outages.

Q. What is an outage?

A. An outage is the removal of electric facilities from service. An outage can be unplanned as a result of a protective relay operation due to a fault on the system or planned for equipment maintenance or to provide safety clearance for the construction of new facilities. Whether planned or unplanned, outages place stress on the power system and create reliability exposure. As the backbone of the New England power grid, 345 kV outages are very difficult to obtain particularly in the heavily loaded area of Southern

Rhode Island. Due to reliability exposure, planned outages are typically limited to the lighter load periods of the Spring and Fall. The 345 kV outages require months, and sometimes over a year, of coordination, study, notification and planning between the requesting utility, ISO-New England and other affected neighboring utilities. Outage availability will significantly influence the construction schedules, particularly that of West Farnum where all three of the existing 345 kV line terminations and all 345 kV protection and controls will be relocated.

Q. Please describe the Kent County Substation component of the Rhode Island Reliability Project.

A. The Kent County component includes the addition of the following:

- one new 345 kV bay consisting of three new circuit breakers and associated disconnects and buswork;
- a new 345/115 kV, 269/358/448 MVA autotransformer;
- a new 115 kV bay consisting of two new circuit breakers and associated disconnects and buswork; and
- the relocation of one existing 345 kV and two existing 115 kV line terminations.

PROJECT SCHEDULE

Q. What is the schedule for the West Farnum and Kent County Substation components?

A. We plan to begin construction of the West Farnum component in the third quarter of 2010 and the Kent County component in the first quarter 2011. Both components are scheduled to be in-service by May 2012. The construction schedules are significantly impacted by outage availability.

Q. What is the planned in-service date of the IRP?

A. The IRP is scheduled to go in-service in December 2012.

ESTIMATED PROJECT COSTS

Q. What are the estimated project costs of the West Farnum Substation and Kent County Substation components of the Project?

A. National Grid has prepared study grade estimates of the costs associated with the proposed Project. Study grade estimates are prepared prior to completion of detailed engineering and are based upon historical cost data, data from similar projects, and other stated assumptions. The accuracy of study estimates is expected to be ± 25 percent. Estimated costs include costs of materials, labor and equipment. The estimate for the West Farnum project is approximately $63 M and will be allocated between the Rhode Island Reliability Project and the IRP based on facility functionality. The estimate for the Kent County project is approximately $22.1 M.

Q. Does this complete your testimony?

A. Yes, it does.

Attachments to Testimony of

Todd G. Kopoyan, P.E.

TGK-1	Revised version of § 4.3.7 of ER
TGK-2	Revised version of Figure 4-10 of ER

No tree clearing will be required along the ROW to facilitate the proposed reconductoring of the G-185N 115 kV transmission line. Tree trimming and vegetative maintenance will be performed along the ROW as necessary to facilitate construction access and installation of erosion and sedimentation controls, as described in Section 4.4.1.

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4.3.6 Modify Kent County Substation

The Kent County Substation is located on Cowesett Road in Warwick, Rhode Island. As described in Section 4.3.1, the new 345 kV transmission line is proposed to be constructed from the existing West Farnum Substation in North Smithfield to the Kent County Substation. To accommodate this 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 will be added in 2009 as part of a separate project)
- Install a new 115 kV bay to include two new 115 kV circuit breakers
- 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.

Figure 4-9 depicts the existing conditions and the proposed layout of the Kent County Substation. Figure 2-2, Sheet 38 of 40 depicts the relocated G-185S and L-190 line segments.

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4.3.7 Equipment Additions at West Farnum Substation

The West Farnum Substation is located on Greenville Road in North Smithfield, Rhode Island. To accommodate the new 345 kV transmission line position within the West Farnum Substation, the substation must be modified with various equipment upgrades and additions, including:

- Two bays of new 345 kV Gas Insulated Switchgear (GIS) consisting of six circuit breakers and associated disconnects and buswork;
- A new building to house the GIS;
- A new control house for the 345 kV relay and control equipment;
- A new 345 kV circuit breaker in the existing air insulated substation (AIS);
- Two new transmission line termination structures; and
- Upgrades to the existing 345 kV AIS bus.

Figure 4-10 (Rev. 2/20/09) depicts the existing conditions and the proposed layout of the West Farnum Substation.

4.4 Construction Practices

The proposed transmission system improvements will be constructed using conventional overhead electric power line and substation construction techniques. Hours of construction will conform to local requirements.

The transmission line work will be constructed in a progression of activities which will normally proceed as follows:

1. ROW vegetation maintenance/clearing and installation of erosion and sediment controls.
2. Access road improvements and maintenance.
3. Installation of foundations.
4. Installation of pole structures.
5. Conductor and shield wire installation.
6. Removal of old structures and/or conductor.
7. Restoration of the ROW.

Each of these transmission line construction activities is described in the following sections. Substation modification activities are described in Section 4.4.7.

National Grid will retain the services of an environmental monitor throughout the entire construction phase of the Project. The purpose of the environmental monitor will be to perform site inspections, ensure compliance with all applicable federal, state, and local permit conditions, maintain strict adherence to National Grid policies, and monitor effectiveness of and propose modifications to BMPs.

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4.4.1 ROW Vegetation Maintenance/Clearing and Installation of Erosion and Sediment Controls

To facilitate construction equipment access along the majority of the ROW and at structure sites, tree trimming or other vegetative maintenance, such as mowing, may be required in select areas. This will be done to provide access to proposed structure locations to facilitate safe equipment passage, to provide safe work sites for personnel within the ROW, and to maintain safe and reliable clearances between vegetation and transmission line conductors. More information on National Grid's ROW maintenance practices is provided in Section 4.4.7 of this report.

From the vicinity of Hardig Road south to the Kent County Substation, trees within the ROW must be removed to provide adequate clearance to electrical conductors

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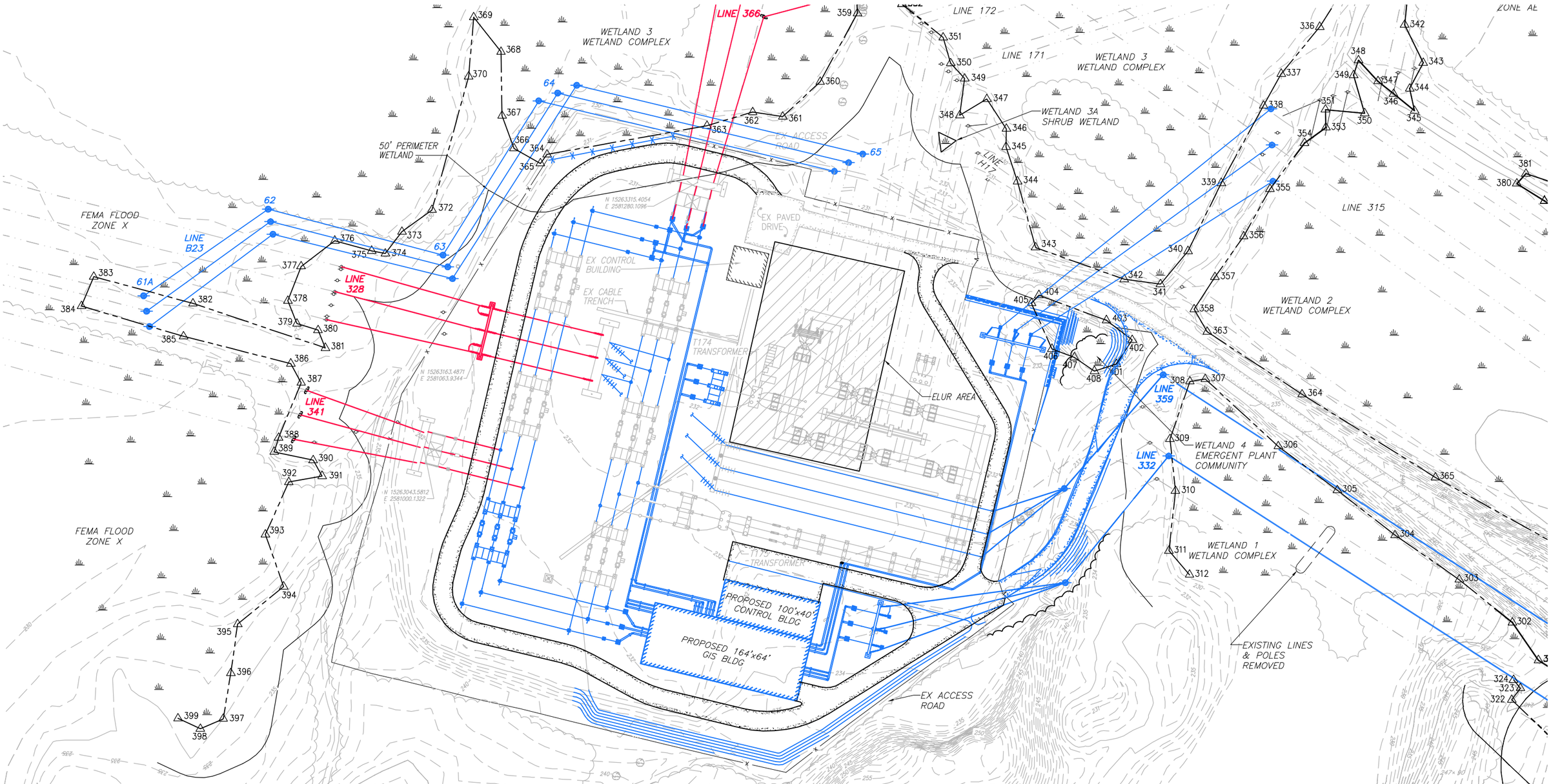

nationalgrid

Vanasse Hangen Brustlin, Inc.

Figure 4-10

Proposed West Farnum Substation Improvements
Rhode Island Reliability Project
Revised 2/20/2009