

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION**

The Narragansett Electric Company
d/b/a National Grid
R.I.P.U.C. Docket No. 4483
RE: The Petition of Wind Energy Development, LLC and
ACP Land, LLC Relating to Interconnection with National Grid

PREFILED DIRECT TESTIMONY OF

**Gregory L. Booth, PE
President, PowerServices, Inc.
On Behalf of Rhode Island Division of Public Utilities and Carriers**

June 5, 2015

Prepared by:
Gregory L. Booth, PE



Engineering And Management Services

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DIRECT TESTIMONY OF GREGORY L. BOOTH, PE

1

2 **Q. PLEASE STATE YOUR NAME AND THE BUSINESS ADDRESS OF YOUR**
3 **EMPLOYER.**

4 A. My name is Gregory L. Booth. I am employed by PowerServices, Inc.
5 ("PowerServices"), located at 1616 E. Millbrook Road, Suite 210, Raleigh, North
6 Carolina 27609.

7 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS MATTER?**

8 A. I am testifying on behalf of the Rhode Island Division of Public Utilities and Carriers
9 ("Division").

10 **Q. WHAT DOES YOUR POSITION WITH POWERSERVICES, INC., ENTAIL?**

11 A. As President of PowerServices, Inc., an engineering and management services firm, I am
12 responsible for the direction, supervision, and preparation of engineering projects and
13 management services for our clients, including the corporate involvement in engineering,
14 planning, design, construction management, and testimony.

15 **Q. WOULD YOU PLEASE OUTLINE YOUR EDUCATIONAL BACKGROUND?**

16 A. I graduated from North Carolina State University in Raleigh, North Carolina in 1969 with
17 a Bachelor of Science Degree in Electrical Engineering. I am a registered professional
18 engineer in twenty-two (23) states, including Rhode Island, as well as the District of
19 Columbia. I am also a registered land surveyor in North Carolina, and am registered
20 under the National Council of Examiners for Engineering and Surveying.

21 **Q. ARE YOU A MEMBER OF ANY PROFESSIONAL SOCIETIES?**

22 A. I am an active member of the National Society of Professional Engineers ("NSPE"), the
23 Professional Engineers of North Carolina ("PENC"), The Institute of Electrical and

1 Electronics Engineers ("IEEE"), American Public Power Association ("APPA"),
2 American Standards and Testing Materials Association ("ASTM"), the National Fire
3 Protection Association ("NFPA"), and Professional Engineers in Private Practice
4 ("PEPP"). I have also served as a member of the IEEE Distribution Subcommittee on
5 Reliability and as an advisory member of the National Rural Electric Cooperative
6 Association ("NRECA") Cooperative Research Network, which is an organization
7 similar to EPRI.

8 **Q. PLEASE BRIEFLY DESCRIBE YOUR EXPERIENCE WITH ELECTRIC**
9 **UTILITIES AND WITH RENEWABLE ENERGY PROJECTS AND**
10 **DISTRIBUTED GENERATION ("DG").**

11 A. I have worked in the area of electric utility and telecommunication engineering and
12 management services since 1963. I have been actively involved in all aspects of electric
13 utility planning, design and construction, including generation and transmission systems,
14 and North American Electric Reliability Corporation ("NERC") compliance. My
15 generation and interconnection experience dates back to the early 1970's and carries
16 forward to the present. I have designed and commissioned generation projects ranging
17 from large peaking plants up to 400 MW to gas, diesel, waste/methane, solar and wind
18 projects from 1 MW to 70 MW. This includes projects in Virginia, Pennsylvania and
19 Delaware in the last few years. I have provided siting and interconnect services to Duke
20 Energy Renewables and performed numerous system impact studies, interconnection
21 facility studies, and designs for many electric utility clients. I have provided testimony
22 before the Federal Energy Regulatory Commission on Facilities Connection
23 Requirements ("FCR") and the negotiations for the modifications to the final FCR

1 provisions. I have provided the engineering design for interconnection and commissioned
2 over 200 separate distributed generation projects.

3 **Q. HAVE YOU PREVIOUSLY TESTIFIED AS AN EXPERT BEFORE THE RHODE**
4 **ISLAND PUBLIC UTILITIES COMMISSION?**

5 A. Yes. I have testified before the Rhode Island Public Utilities Commission on numerous
6 matters, including Docket Nos. 2489, 2509, 2930, 3564, 3732, 4029, 4065, 4218, 4237,
7 4307, 4360, 4382, 4473, 4539, and D-11-94. My testimony in Rhode Island has included
8 filed and live testimony on previous Electric Infrastructure, Safety and Reliability Plan
9 Fiscal Year Proposal filings by National Grid (“Company”) in Docket Nos. 4218, 4307,
10 4382, 4473, and 4539.

11 **Q. HAVE YOU PREVIOUSLY TESTIFIED AS AN EXPERT IN OTHER**
12 **JURISDICTIONS?**

13 A. I have testified before the FERC and numerous state commissions, including in
14 Delaware, Florida, Maryland, Massachusetts, North Carolina, Pennsylvania, and
15 Virginia. This includes filed testimony before the Massachusetts Department of Public
16 Utilities on behalf of the state attorney general concerning a National Grid solar program.

17

1 **Q. WHAT IS THE PURPOSE OF THIS TESTIMONY?**

2 A. The purpose of my testimony is to introduce *Exhibit GLB-1*, Report of Gregory L. Booth,
3 PE which is a review of National Grid’s proposed edits to the Distributed Generation
4 Interconnection Tariff (“DG Tariff”) filed on January 15, 2015 in response to an interim
5 order in the Rhode Island PUC Docket 4483. Docket 4483 is a broader petition by Wind
6 Energy Development, LLC and ACP Land, LLC (“Petitioner”) against National Grid to
7 resolve several disputes related to the interconnection of wind generating units. I also
8 address the Petitioner’s comments and recommendations related to National Grid’s DG
9 Tariff and to the overall interconnection process. My assessment and recommendations
10 are provided in the report.

11 **Q. WOULD YOU SUMMARIZE YOUR FINDINGS AND RECOMMENDATIONS**
12 **IN *EXHIBIT GLB-1*?**

13 A. Yes. In the case of Rhode Island and many states, interconnection processes and
14 agreements must balance the desire to encourage more DG, particularly renewables, with
15 the need for electric utility grid integrity. Between these two interests, grid integrity is the
16 prevailing objective since no one benefits from a reduction in reliable power delivery or
17 safety. Based on my evaluation of National Grid’s DG Tariff as compared to industry
18 practices, and in particular to the successful adoption by utilities of similar processes, I
19 support the Company’s revisions. I do not concur with the Petitioner’s recommended
20 changes or with their overall position that National Grid’s DG Tariff obstructs timely and
21 affordable project development. Generator interconnection is inherently complex, and
22 electric utilities must evaluate multiple components to ensure that system integrity and
23 grid stability are not impacted. I also concur with the Company’s current policy, which is
24 consistent with industry practice, of ascribing all costs necessary to interconnect a

1 generator to the generator customer including those costs for system upgrades. Lastly, I
2 strongly believe that the Company's Electric Infrastructure, Safety, and Reliability Plan
3 ("ISR") and the interconnection processes and costs should remain decoupled. My
4 specific recommendations are that:

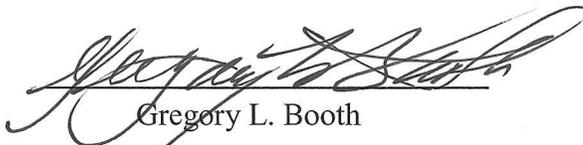
- 5 • National Grid should continue to seek enhancements and prioritize modifications for
6 DG Tariff simplification. Future changes brought before the Division and
7 Commission should take into consideration language approved for the Company's
8 Standards for Interconnection of Distributed Generation tariff in Massachusetts.
- 9 • National Grid may consider adopting a version of the Federal Energy Regulatory
10 Commission's Small Generator Interconnection Procedures as a basis for a tariff
11 should the Company pursue revamping the document.
- 12 • I suggest that the Company implement a publically available site on which its
13 distribution generator interconnection queue for facilities over 15 kW can be
14 reviewed by any interested party. The list should include, at minimum, resource type,
15 capacity, feeder number, substation, and operational status.
- 16 • In the case where an interconnecting generator requires system upgrades, the
17 Company may compare those system upgrades against the Company's current area
18 construction work plans to determine if there are common modifications that can
19 reduce the cost to the generator customer.
- 20 • Costs for system upgrades or modifications required for generator interconnection
21 shall be the responsibility of the generator customer and shall not be included in the
22 ISR for recovery from ratepayers.

AFFIDAVIT OF GREGORY L. BOOTH, PE

Gregory L. Booth, does hereby depose and say as follows:

I, Gregory L. Booth, on behalf of the Rhode Island Division of Public Utilities and Carriers, certify that testimony, including information responses, which bear my name was prepared by me or under my supervision and is true and accurate to the best of my knowledge and belief.

Signed under the penalties of perjury this the 5th day of June, 2015.


Gregory L. Booth

I hereby certify this document was prepared by me or under my direct supervision. I also certify I am a duly registered professional engineer under the laws of the State of Rhode Island, Registration No. 8078.



Gregory L. Booth, PE

EXHIBIT GLB-1

**STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
PUBLIC UTILITIES COMMISSION**

REPORT OF

**Gregory L. Booth, PE, President
PowerServices, Inc. d/b/a PowerServices and Consulting, Inc.
On Behalf of Rhode Island Division of Public Utilities and Carriers
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REPORT OF GREGORY L. BOOTH, PE**

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REPORT OF GREGORY L. BOOTH, PE

I. INTRODUCTION

PowerServices, Inc. (“PowerServices”¹) was engaged by the Rhode Island Division of Public Utilities and Carriers (“Division”) to assist in the evaluation of responses to the Rhode Island Public Utilities Commission’s (“PUC” or “Commission”) November 12, 2014 Interim Order (“Interim Order”) in Docket 4483. The Rhode Island PUC Docket 4483 is a broader petition by Wind Energy Development, LLC and ACP Land, LLC (“Petitioner”) against National Grid (“Company”) to resolve several disputes related to the interconnection of wind generating units. Within the Interim Order, the PUC provided several directives to National Grid pertaining to the Company’s process and procedures for distributed generation (“DG”) interconnection. This report addresses the overall changes that the Company incorporated in the Distributed Generation Interconnection Tariff (“DG Tariff”) filed on January 15, 2015 in response to the Interim Order, assesses the reasonableness and practicality of the DG Tariff procedures in relation to successful industry practices, and addresses comments provided by Wind Energy Development, LLC and ACP Land, LLC filed February 5, 2015. Additionally, PowerServices has evaluated Responses by National Grid to the Data Requests and the Joint Rebuttal Testimony of Timothy R. Roughan and John C. Kennedy on behalf of National Grid.

The filings² reviewed were in response to the Commission’s Interim Order, specifically Item No. 4 which states that:

¹ For the purposes of this report, reference to “PowerServices”, “I”, and “my” are interchangeable.

² On April 24, 2015, National Grid filed Direct Testimony of Timothy R. Roughan and John C. Kennedy. On May 7, 2015, the Petitioner provided Pre-Filed Testimony of Mark DePasquale. Each testimony supported and/or reiterated comments made in original filings.

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“National Grid will convene a working group of parties interested in providing input into possible revisions to the Distributed Generation Interconnection Tariff (R.I.P.U.C. No. 2078). By December 1, 2014, the Company will file proposed tariff revisions resulting from the working group, including an explanation of any unresolved issues. The proposed revisions may also include recent changes to ISO-NE rules or operating procedures and the Renewable Energy Growth law.”

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II. GENERATOR INTERCONNECTION AND INDUSTRY PRACTICES _____

First and foremost, as a matter of background information, generator interconnection is an inherently complex process. Except for small facilities, the process may include multiple steps including scoping, a feasibility study, a system impact study, and a facilities study. The number of steps required and depth of studies depends on the generator size, operating characteristics, and location of the requested interconnection. An electric utility does not control these requests, but rather must respond to inquiries that vary in number, size and location at any given time. The ability for the utility's electric power system ("EPS") to accommodate a specific generator output must be considered on a one-by-one basis. The utility must evaluate multiple components to ensure that system integrity is not impacted by the proposed generator, including, but not limited to:

- Circuit type and loading (radial, spot or area network)
- Circuit customer characteristics and power quality sensitivity
- Contribution to fault current
- Protective device settings
- Transformer size
- Conductor size and load balancing
- Reactive power
- Other system impacts

Industry practices have evolved such that units with known generation characteristics and size limitations (for instance, inverter based under 10 kW) follow an expedited path requiring a

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simpler form of notification. This saves both the utility and generator owner time and expenses for interconnection. However, generators that are outside the scope for expedited review must be evaluated in depth to identify adverse system impacts. It must be emphasized that “but for” the existence of the interconnected generator, the system impacts would not occur. Standard industry practice provides that the generator owner is responsible for study costs, facilities to physically interconnect and meter the generator, and for system improvements necessary to mitigate any identified system impact, if applicable.

There are few predictable system impacts brought about by DG, whether adverse or beneficial; each project must be studied independently due to varying generator size, operating characteristics, and location of the requested interconnection. The size, type and amount of previously interconnected generation on the area system must be considered as well. Thus, utilities require a queue to evaluate interconnection requests in sequence and detailed procedures to manage processes equitably and as efficiently as possible. As previously mentioned, due to the uncertainty of number and scope of projects requiring interconnection at a given time, processing applications and constructing interconnection facilities within specific timeframes poses great challenges. There are often learning curves as both utilities and generator owners become familiar with requirements. In the case of Rhode Island and in many states, interconnection processes and agreements must balance the desire to encourage more DG, particularly renewables, with the need for electric grid integrity. Between these two interests grid integrity is the prevailing objective, since no one benefits from a reduction in reliable power delivery or safety.

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III. REVIEW OF PETITIONER'S COMMENTS

The Petitioner has been involved in an ongoing generator interconnection process with National Grid and has filed comments and language for the Company to incorporate in addition to, or in lieu of, many proposed DG Tariff revisions. My review of the Petitioner's statements is focused on major matters pertaining to the DG Tariff, rather than any specific dealings between the Company, Petitioner, and other parties. Areas that are not directly addressed, such as tax issues, may have relevance to the Petitioner's dispute but are better managed through the normal course of this proceeding as needed. I have arranged my review to correspond with the Petitioner's section headings.

A. Simplicity

The Petitioner claims that the Company's proposed edits to the DG Tariff are "*merely additive rather than an effort to simplify the tariff as recommended by the PUC*". PowerServices agrees that many edits are clarifications to what is a complex tariff. However, the Company must manage not only standard generator interconnections, but must incorporate unique provisions for state mandated programs such as the Renewable Energy Growth Program. Many of the Company's revisions are necessary clarifications, such as metering requirements. Others provide beneficial information such as the Pre-Application report which is required for certain generators. On the surface, it appears to add another step for interconnection, but is actually a method for the generator customer to obtain critical decision-making information prior to investing time and money in a project.

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Overall, I support the Company's proposed revisions, but believe that there remain opportunities for improvement and streamlining. It is understood that National Grid is seeking modifications to their Standards for Interconnection of Distributed Generation Tariff in Massachusetts (MDPU No. 1219) and "*once such language has been approved in Massachusetts, the Company will review the Rhode Island DG Tariff and may offer similar clarification language in Rhode Island at a future date*".³ I recommend that the Company prioritize modifications to simplify the Rhode Island DG Tariff for Division and Commission consideration, particularly to the extent that all generators may follow similar paths regardless of renewable status. Alternately, I would like to highlight the success of adopting a version of the Federal Energy Regulatory Commission's ("FERC") recommended Small Generator Interconnection Procedures ("SGIP") as a basis for a tariff should the Company pursue revamping the document. Many utilities have used the FERC format for interconnection procedures. This includes Duke Energy (Duke Energy Carolinas and Duke Energy Progress) in North Carolina where under these procedures, Duke Energy has successfully interconnected over 400 non-residential projects with capacity between 10 kW and 5 MW, totaling over 640 MW of renewable generation excluding hydroelectric. Duke Energy makes publically available their distribution generator interconnection queue, which includes resource type, capacity, feeder number, substation, and operational status.⁴ I suggest that the Company implement a publically available queue of DG projects over 15 kW that

³ National Grid filing; January 15, 2015; footnote 3, page 3 of 3.

⁴ Distribution generator interconnection status and queues for Duke Energy Carolinas and Duke Energy Progress are available at <https://www.duke-energy.com/generate-your-own-power/nc-connect-to-the-grid.asp> and <https://www.progress-energy.com/carolinas/business/renewable-energy/interconnect-nc.page>, respectively.

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includes, at minimum, similar details such that generator customers or other interested parties may review the status of interconnection requests.

B. Time

The Petitioner desires to formalize the amount of time that the Company must perform interconnection work by recommending the following revision to the DG Tariff:

All interconnection work must be performed no longer than sixty (60) days from completion of the renewable energy customer's interconnection Impact Study, if required, or else sixty (60) days from the customer's initial application for interconnection. These deadlines cannot be extended due to customer delays in providing required information, all of which must be requested and obtained before completion of the Impact Study. The electric distribution company will be liable to the interconnecting customer for all actual and consequential damages resulting from the noncompliant interconnection delay including, but not limited to, the full value of any lost energy production, and any legal fees and costs associated with the recovery of those damages. These penalties and damages shall be borne by the electric distribution company's shareholders, not by the electric distribution company's ratepayers.

I find these recommendations unreasonable and overly burdensome for several reasons. First, the Company cannot be held to a construction schedule on a project that may or may not advance. A generator owner has not necessarily committed to the project when an impact study is complete. There is even more uncertainty that a generator project advances after an initial application is made, which is well before the system impact study.

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Second, it is inconceivable that that Company has enough information within 60 days of application receipt in order to design, procure, and successfully schedule all interconnection work. It is also improbable that the Company achieve a 60 day time frame after an impact study is complete. As discussed earlier in this report, each generator interconnection is unique. They require varying degrees of interconnection facilities ranging from transformers and metering equipment to miles of line reconductoring, breakers or other line protection equipment, and substation upgrades. Equipment may have long lead times and would not be ordered until the Customer executes an Interconnection Service Agreement (“ISA”) or similar commitment to the project. Once a final commitment is made by the generator customer, interconnection construction must be scheduled into existing utility workload. For these reasons, the Company must be allowed to estimate the construction time frame on a case-by case basis which should be reasonable, achievable, and mutually agreeable.

Lastly, I disagree that the Company and/or its shareholders should be liable for construction delays or be required to compensate a generator owner for damages. There are multiple decision points and logistics to manage during the course of the process for both the generator customer and the Company, and each entity may impact the construction schedule. If the process is not to the satisfaction of the generator customer, there are other avenues to pursue. Common industry practice includes dispute management in front of appropriate regulatory agencies, and in the case of the Company’s DG Tariff, Section 9.0 sets out a well-defined dispute resolution process involving the Commission and optional arbitration. The Petitioner’s request to seek damages for the Company’s inability to meet what I believe are

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impossible construction deadlines is unreasonable and would result in unjustified benefits to the generator.

The Petitioner also requests that the generator customer have the right to construct interconnection facilities under certain conditions, including the right to cross a public way.⁵

I do not concur. Working in and around high voltage lines and equipment requires skill sets and safety requirements that are not common among most construction companies. There is too great of a risk to personal safety and grid reliability to allow this work to be performed under the direction of those outside the industry. Only National Grid utility engineers, contractors, vendors and equipment would be acceptable for inclusion into the process. Furthermore, the Company oversight, approvals, and inspections would be the only prudent procedure in assuring that electric utility safety and reliability criteria are met.

Finally, The Petitioner claims that the Company's treatment of generators greater than 3 MW (nameplate capacity) or those that require substation upgrades is discriminatory between classes of projects. In this case, the Company maintains the right to require special interconnection requirements and more time for studies on a mutually agreed upon basis. Adopting differing requirements based on a project size or generation characteristic is common industry practice. For example, an expedited process for inverter based facilities up to 10 kW is offered in the FERC SGIP, and the Company offers the same up to 15 kW in its DG Tariff. I find the 3 MW demarcation and the Company's policy reasonable from an

⁵ Petitioner requested in Section III. Cost portion of filing. (no page numbers available for reference)

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engineering and system stability standpoint. Larger scale projects have greater generating capability and more impact on a system, particularly if situated on circuits lacking distribution capacity for the additional generation. The generator output may impact circuits reaching to the substation, requiring breaker installations or other upgrades. The more complex engineering and design requires additional time to evaluate, which the Company should be afforded. This is not discriminatory, but is necessary and practical.

C. Cost

The Petitioner provides comments on Sections 5.3 and 5.4 of the DG Tariff regarding the Company's policy of refunding costs borne by an interconnection customer for System Modifications under various scenarios. The revised sections read as follows:

5.3 System Modification Costs

The Interconnecting Customer shall also be responsible for all costs reasonably incurred by Company attributable to the proposed interconnection project in designing, constructing, operating and maintaining the System Modifications. At the time that the Company provides an Interconnecting Customer with any Impact Study or Detailed Study, the Company shall also provide, along with that Study, a statement of the Company's policies on collection of tax gross-ups. As appropriate, to the extent that subsequent Interconnecting Customers benefit from System Modifications that were paid for by an earlier Interconnecting Customer, the Company may assess a portion of the costs to such subsequent Interconnecting Customers, which will be refunded to the earlier Interconnecting Customer if actually collected. Such assessments may occur for a

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period of up to five years from the Effective Date of the earlier Interconnecting Customer's Interconnection Service Agreement.

5.4 Separation of Costs

Should the Company combine the installation of System Modifications with additions to the Company's EPS to serve other customers or interconnecting customers, the Company shall not include the costs of such separate or incremental facilities in the amounts billed to the Interconnecting Customer for the System Modifications required pursuant to this Interconnection Tariff. The Interconnecting Customer shall only pay for that portion of the interconnection costs resulting solely from the System Modifications required to allow for safe, reliable parallel operation of the Facility with the Company EPS.

The Petitioner contends that the sections lack clarity and may be construed to allow the Company to charge the interconnection customer for system upgrade costs that are necessary to serve other customers. The Petitioner states that:

"The amended language in section 5.3 disregards the central question of whether distributed generation should be required to fund system upgrades that are necessary to provide satisfactory customer service (that "benefit system capacity")."

The Petitioner further states that:

"If system upgrades provide any benefit to system capacity that benefits all ratepayers, they must not be charged to the interconnecting customer."

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At the crux of this argument is the notion that system upgrades required to accommodate DG interconnection are necessary to serve customers, and that the retail customer benefits. In fact, the only reason that the system work occurs is “but for” the generator. Modifications and costs incurred by the Company to implement upgrades are driven by the generator customer needs, not the Company’s retail customers. The generator customer should be solely responsible for all incremental costs to the Company. It is imprudent and unreasonable to shift these costs to a retail customer that was receiving reliable service prior to the generator interconnection. I agree with Sections 5.3 and 5.4 as revised. If a future interconnection customer benefits or if work is performed to specifically serve other customers, I agree that costs should be allocated in accordance with Sections 5.3 and 5.4.

Additionally, The Petitioner requests that the Commission require the Company to merge interconnection system modification costs with system investments proposed through the annual ISR proceedings. The Petitioner contends that:

“Interconnection customers deserve certainty that the Company is prioritizing system upgrades that enable the interconnection of the large volumes of renewable energy proposed and planned for our distribution grid. Rather than putting the costs of all such system upgrades on the interconnecting customer they should be budgeted and integrated into the annual plan approval process.”

I strongly disagree and believe that the ISR and interconnection processes and costs should remain decoupled. The ISR is a long term, strategic plan to maintain grid integrity. The Company must plan and design the system to meet retail load requirements during both

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normal and contingency conditions. The modeling criteria is based on actual load on the system. It would be impossible for the Company to incorporate the dynamics of renewables of unknown quantity, location and generation characteristics in this planning process. In simple terms, The Petitioner is asking ratepayers to pay for electric grid upgrades now, hoping that future renewable generation shows up on the system. Unfortunately, there is no assurance that the system upgrades are appropriate to accommodate future renewable generation since the number, characteristics, and location of generators are unknown. That is precisely why National Grid, like all major electric utilities, has adopted an interconnection procedure that manages each generator request in sequence, estimates costs incurred as a result of interconnecting the generator, and assigns those costs to the generator making the request. The Company's overall process is consistent with utility practices and FERC recommended procedures and should remain separate and apart from the ISR process. I am not opposed, however, to the Company comparing system upgrades required for a generator interconnection against the Company's current area construction work plans to determine if there are common modifications that can reduce the cost to the generator customer. This is not a recommendation to integrate interconnection system upgrades within the ISR plan, but rather a screen within the interconnection process performed under Section 5.4 of the DG Tariff to the extent the Company is not currently performing this review.

Regarding cost, The Petitioner's desire to move the obligation for system impact costs from the interconnection generator to ratepayers through the ISR proceeding is unreasonable. As explained at length in my report, "but for" the existence of the interconnecting generator, the system upgrades are not necessary. A request to shift costs from a generator to the ratepayer

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creates cross-subsidization for which I am opposed. Most importantly, it masks the true cost of renewable generation. For instance, two 1 MW solar projects may be planned in two different regions of the Company's service territory with very different interconnection study results. The first project may not require system upgrades but the second project requires \$300,000 of system improvements due to the location on the Company's distribution feeder. If both are eligible for comparable incentives under the Renewable Energy Growth program, it could very well be that the first project is financed and built while the second is deemed uneconomic and would not be built. Under the Petitioner's proposal, ratepayers and not the generator owner of second project would be responsible for the \$300,000 system improvement. The Petitioner's methodology shifts what should be a true cost of renewable generation development, expected to be financed through the Renewable Energy Growth tariff, from the generator owner to the ratepayer. The result is that an uneconomic renewable generator is constructed at the expense of ratepayers. This hides the true cost of renewable generation, places an unnecessary financial burden on ratepayers, and is to the sole benefit of the generator owner. The Petitioner's proposal, while presented as a method to increase renewable generation, would encourage uneconomic projects and is counter to the Renewable Energy Growth program intention of "continuing the development of renewable energy distributed generation in the load zone of the electric distribution company at *"reasonable cost" (emphasis added)*."⁶

The Petitioner proposes the language below under the rationale that ratepayer *"investments in facilitated interconnection of our renewable energy supply will be more than compensated by*

⁶ Renewable Energy Growth Program; 39-26.6-2; lines 15-17

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rate reductions resulting from the resulting diversification of our electricity supply as needed to relieve constraints during our limited periods of peak consumption”:

“The electric distribution company may not charge an interconnecting renewable energy customer for any upgrades to its Electric Power System that can and should be funded through rates assessed pursuant to its Electric Infrastructure, Safety and Reliability Provision and Plan, including specifically any maintenance, repair or upgrade of any component of the Electric Power System that has been deferred for more than thirty years.”

For the reasons previously stated, I strongly oppose the Petitioner’s proposal to roll system upgrade costs required to interconnect renewable generation into ISR proceedings and recover those costs from ratepayers under any circumstances. Additionally, I dispute the Petitioner’s assertion that renewable energy provides electricity supply diversification needed to relieve constraints during periods of peak consumption. Electric utility distribution planning must account for the ability to serve load under peak conditions or outages. Grid-connected DG, unless it has a consistent fuel source and is dispatchable (firm) by the electric utility, is not considered a viable alternative to relieve system constraints during system peaks or outages. Renewable generation may defer or avoid generation during times of operation, for which the generator owner is compensated, but it is not a reliable solution to relieve grid constraints and does not forgo system investments otherwise necessary for local reliability. The electric utility is faced with the non-delegable duty of operating and maintaining the electric distribution grid to meet the peak load requirements of its customers,

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regardless of when those peak demands occur. Peak loads may occur, and often do, when there is little or no wind and the associated wind generation has no capacity value, or when the sun is insufficient to provide meaningful solar capacity to the electric distribution grid. This means that renewable DG projects, which are neither firm nor dispatchable by the utility, offset no capital investment by the utility for meeting the peak load. Furthermore, unless a DG interconnection upgrade precisely matched the system upgrade project from National Grid's current construction work plan, it would provide no offset in plant additions and cost to the utility or its retail customers.

D. ISO Review

National Grid revised Section 3.4(3)(c) of the DG Tariff as follows:

The timelines in Table 1 will be affected if the ISO-NE's Operating Procedure 14 will be required. This will occur if the Interconnecting Customer's Facility is greater than or equal to 5 MWs and could occur if aggregate capacity of Facilities connected (which are on the same feeder and are physically close to each other) is greater than or equal to 5 MWs.

The Petitioner comments that Grid's revisions to Section 3.4(3)(c) is a "*misguided attempt to invoke added jurisdiction and delay on the Coventry projects*" (The Coventry projects consist of 6 distributed generation and net metering projects) and that "*National Grid now raises ISO procedure as a means to further delay the project*".

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My comments do not address the discussions between the Company, Petitioner and ISO-NE regarding the Coventry project, but rather the Company's rationale for including the revised language. The ISO-NE's Operating Procedure 14 is applicable to generators meeting certain requirements. The Introduction and Background reads as follows (*emphasis provided*):

*This Operating Procedure (OP) describes the minimum technical requirements for defined Generators, Settlement Only Generators (SOGs) Demand Response (DR), Asset Related Demands (ARDs) and Alternative Technology Regulation Resources (ATRRs) under the control/jurisdiction of ISO New England Inc. (ISO). For the purposes of this procedure, under the control/jurisdiction of ISO is defined as: a.) **an individual or aggregated asset/resource/unit/facility classification meeting the technical criteria as stipulated in Sections II, III, IV, V, VI or VII as applicable** or b.) participating in the wholesale electric market.⁷*

Section II.A.2.b defines and addresses generating facilities as follows:

A generating facility of five (5) MW or greater interconnected below 115 kV shall register as a Generator.⁸

Therefore, ISO-NE's Operating Procedure 14 may apply to facilities of five (5) MW or greater whether measured in aggregate or for an individual facility. National Grid appropriately includes language that allows for ISO-NE involvement in generation projects, as needed, and I concur with the Company's revised Section 3.4(3)(c) as written.

⁷ ISO New England Operating Procedure No.14 - page 6 of 54

⁸ ISO New England Operating Procedure No.14 - page 7 of 54

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E. Miscellaneous

The Petitioner closes their filing with miscellaneous observations and contends that National Grid “*does little to simplify or improve the interconnection process for customers and they introduce additional obstructions for timely and affordable project development.*”

Overall, I disagree with the Petitioners and support the Company’s proposed revisions. The Company must approach each and every generator interconnection methodically and in a way that preserves grid integrity. The Company’s proposed clarifications and application steps provide an appropriate interconnection process.

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IV. CONCLUSION

Based on my evaluation of National Grid's DG Tariff as compared to industry practices, and, in particular, to the successful adoption by utilities of similar processes, I support the Company's revisions. However, I recommend that the Company continue to seek enhancements and prioritize modifications for simplification. Future changes brought before the Division and Commission should take into consideration language approved for the Company's Standards for Interconnection of Distributed Generation tariff in Massachusetts. The Company may also consider adopting a version of the FERC SGIP as a basis for a tariff should the Company pursue revamping the document. In order to bring more transparency to the interconnection process, I also suggest that the Company implement a publically available queue of DG projects over 15 kW that includes, at minimum, resource type, capacity, feeder number, substation, and operational status. The list should be made available to allow generator customers or other interested parties to review the status of interconnection requests.

I do not concur with the Petitioner's recommended changes or with their overall position that National Grid's DG Tariff obstructs timely and affordable project development. Generator interconnection is inherently complex and electric utilities must evaluate multiple components to ensure that system integrity and grid stability are not impacted. The Company does not control the size, location, characteristics, and timing of proposed generation and must have a process in place to methodically manage each request. The Company's DG Tariff appropriately offers expedited procedures for smaller generators while larger and more complex projects require additional engineering evaluation. As part of this evaluation, the Company may compare system

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upgrades required for a generator interconnection against the Company's current area construction work plans to determine if there are common modifications that can reduce the cost to the generator customer.

Lastly, I strongly believe that the ISR and interconnection processes and costs should remain decoupled. The ISR is a long term, strategic plan to maintain grid integrity. Generator interconnection is an independent process prescribed through the DG Tariff. It would be impossible for the Company to incorporate the dynamics of renewables of unknown quantity, location and generation characteristics in the ISR planning process. It is also inconsistent with industry practice and unfair to the Company's customers to roll any costs that are the responsibility of the generator customer into the ISR proceeding to be recovered from ratepayers. Any such change would unquestionably increase the cost to the Company and the electric ratepayers with little, if any, offsetting benefit.