State of Rhode Island Public Utilities Commission

In Re: Dispute Resolution Petition of WED Coventry One, LLC, WED Coventry Two, LLC, WED Coventry Three, LLC, WED Coventry Four, LLC, WED Coventry Five, LLC and WED Coventry Six, LLC against The Narragansett Electric Company d/b/a National Grid

Docket No. 4547

Pre-Filed Testimony of

Mark Depasquale

February 25, 2015

I. Introduction and Qualifications

Q. Please state your name and business address.

A. My name is Mark Depasquale and my business address is 3760 Quaker Lane, North Kingstown, Rhode Island 02852.

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

A. I am the principal of Green Development, LLC dba Wind Energy Development, LLC (WED).

Q. When was WED formed?

A. The company was founded in 2009.

Q. What was your professional background before starting WED?

A. I have over twenty years in the commercial construction industry. I've developed, managed and coordinated over 100 projects, totaling over $350 million. My experience ranges from manufacturing and warehouse facilities, commercial industrial parks, municipal facilities, road construction, to office complexes and retail centers.

Q. Why did you start WED?

A. Given my history of site work for development, I wanted to start a business that will have a positive impact on the environment and economy my kids will inherit. I saw and still see a great opportunity in wind energy development and my professional experience has prepared me well for that work.

Q. What is WED's mission?

A. To be the lead developer of wind energy for Rhode Island, provide competitively priced clean, renewable energy, create jobs and help save farms and open space.

Q. How has the business done to date?

A. It is coming together nicely but not without substantial challenges.

Q. What are the successes?

A. We built one of the first DG projects in North Kingstown, next to my house, proving that we can deliver and operate these projects effectively. That turbine is performing extremely well. We have six more projects, involving the development of ten turbines, permitted in Coventry. Two of those turbines (WED COV 3 and WED COV 4) are currently enrolled in the Distributed Generation Standard Contract program. We have a net metering finance agreement to net meter energy from COV 1 (one turbine) to the Town of Coventry. We anticipate either purchases or net metering finance agreements with public entities for WED Coventry Six, LLC (three turbines) and WED Coventry Two, LLC (three turbines). We intend to either enroll WED Coventry Five, LLC (one turbine) under the Renewable Energy Growth tariff or contract with a public entity for that turbine's power. We are under contract to remove the existing turbine owned by the Town of Portsmouth and replace it with a new Vensys turbine that will be net metered to the Town of Portsmouth. We are planning additional projects in West Warwick, North Smithfield and a number of other locations. There is lots of interest from investors and banks, provided we can efficiently and cost effectively interconnect these projects. We are upbeat about advancements and opportunities in Rhode Island's energy policy given

the current administration of the Office of Energy Resources, the energy planning work pending approval (including the results of the Brattle Group's benefit/cost study demonstrating the great net benefits of these investments in renewable energy), and hopefully improving alignment of the interests of public policy goals and utility policies and procedures. We see a great opportunity to preserve farms and open space by providing supplemental income from the colocation of wind energy.

Q. What are the challenges?

A. The risks and soft costs of project development are still substantial, from siting policies to local taxation policy to legal challenges posed by the utility (interconnection). The North Kingstown turbine is operating at a loss because the contracting DG rate of $.1335 per kWh is far too low to sustain the project costs. Our state energy plan reflects the wealth of stakeholder and expert input on the need to diversify our energy sources for energy security, reliability and cost reasons, but the State's policy statements, policies and regulatory positions still downplay and do not fully embrace the significant opportunity for diversification through renewable energy.

Q. Do you adopt the facts alleged in the petition filed in this matter as your testimony?

A. Yes, I do with only minor exceptions.

Q. What are those exceptions?

A. On page 4, the following opinion is from David Columbo, another witness to this proceeding: "The EPS servicing COV1 through COV6 is more than forty years old and if it had been properly maintained and upgraded it would be well able to accommodate

the requested interconnections for COV1 through COV6 without these expensive system modifications." I was not involved with Church Community Housing's Sandywoods project or the anaerobic digestion project discussed in the petition, so I cannot testify as to what happened with the interconnection administration of either of those projects.

Q. Are there any documents you will be referring to in your testimony?

A. Yes, the following documents are attached to and will be referenced in my testimony.

1) Feasibility Study for COV 1 (3/5/13)
2) Impact Study for COV1 and 2 (4/18/14)
3) National Grid letter regarding Impact Study for COV 1-6 (8/14/14)
4) Impact Study for COV1-6 (12/18/14)
5) Revised Impact Study for COV1-6 (2/18/15)
6) Email correspondence

Q. What is your general impression of the interconnection process National Grid has administered for the WED COV 1-6 projects?

A. National Grid acts as a gatekeeper for interconnection and has clearly obstructed the efforts to interconnect these turbines. Although there are many detailed examples of this gatekeeping obstruction that will come out in this arbitration, the most obvious evidence is the time it has taken to complete the studies and how the cost of interconnection has is so dramatically reduced as we seek relief from outside parties. After we filed our first interconnection petition at the PUC, the time required for interconnection and the cost of interconnection both skyrocketed. The schedule was set so as to preclude our compliance with the distributed generation standard contract for COV1 and the price went from about

$270,000 for one turbine, to $1.1 million for two, to almost $13 million for seven. Now, as we pursue this petition and legislative relief, it has become clear that over the two years that National Grid has been studying the impact of these interconnections, it never studied the simplest means of interconnection, opting instead for an interconnection plan that took far too long to develop and required rebuilding almost $13 million of their system improvements. Now that they are under pressure and are forced to look at the simpler means of interconnection, they have completed a corrected impact study in less than thirty days. Under pressure to allow the projects to construct their own interconnections, they now contemplate completion of the interconnection of all ten planned turbines at an estimated cost of $5.4 million, less than half their previous estimate for seven turbines. The estimated time to interconnect is still 17-20 months, which would terminate the DG Contracts entered for COV 3 and 4 (as the interconnection schedule did for COV1). As Shakespeare wrote in Hamlet, "something is rotten in the State of Denmark."

Q. Didn't your engineer propose the original plan for interconnection?

A. Our engineers produced proposed plans for the interconnection of COV1 and COV2. However, those proposals are just that, proposed design based on the best information available to our engineer. Only National Grid has complete information about its distribution system and it is presumed that through the feasibility/impact study process, National Grid will determine the most effective and efficient means of interconnection. When National Grid responded with a cost of interconnecting those turbines at $1.1 million and a schedule of 18-24 months to rebuild their infrastructure, they assured us in

a meeting at their office on May 1, 2014, that once the system was rebuilt we could interconnect up to ten turbines on that circuit. So, in order to distribute the cost, we proposed to interconnect 10 turbines on two circuits. They proposed to study the interconnection of all ten turbines together without requiring another impact study agreement or any proposed design for the interconnection. John Kennedy simply sent us a letter dated August 14, 2014 (attached), in which he said "The Combined ISRDG will analyze the impact of the projects (in the order provided) cumulatively on National Grids EPS." We presumed all along, evidently incorrectly, that National Grid had committed to study the most effective and efficient means of interconnecting the 10 turbines. When they ultimately released the study of those turbines, they concluded that only one turbine could interconnect to the circuit studied for COV 1 and 2 (contrary to their prior impact study and its follow up), that 3 of the proposed turbines could not be interconnected, and that the interconnection of the seven remaining turbines would require almost $13 million of improvements to their system. When we rejected that study and began to seek relief from the Commission and the General Assembly, they (miraculously) came up with the new proposed plan for interconnection described above.

Q. What is your position on National Grid's estimated costs to interconnect these turbines?

A. There are two issues: 1) as discussed above, National Grid did not study or propose the most cost effective means to interconnect these turbines, opting instead to propose rebuilding their system on our back/dime; and 2) the staggering cost of system improvements would not be necessary if National Grid properly maintained and upgraded

their system. As set out in our petition, National Grid's Interconnection Tariff says that interconnecting customers are not required to fund system improvements that benefit system capacity. Two of these projects are enrolled in the DG Standard Contract program and one is seeking enrollment (improperly precluded as we have addressed in Docket 4277), and that law states that: "a distributed-generation-facility owner may appeal to the commission to reduce any required system upgrade costs to the extent such upgrades can be shown to benefit other customers of the electric-distribution company and the balance of such costs shall be included in rates by the electric-distribution company for recovery in the year incurred or the year following incurrence." R.I. Gen. Laws 39-26.2-7(2)(i). We seek such relief for those DG projects here. We asked our engineer to look at the impact study related to the interconnection of COV 1 and 2. He concluded that if National Grid had properly maintained and upgraded its distribution system the huge bill for system improvements associated with these interconnections would not be required. The same is true for the $13 million estimated cost of system improvements in the subsequent impact study for interconnecting 7 turbines.

Q. Is it true, as National Grid alleges, that the impact studies were delayed by the projects' failure to provide accurate information?

A. No, it is not. The efficacy and timeliness of their two years of studies is completely undermined and belied by the speed of the current process of correctly studying the simplest means of interconnection. As will be specifically addressed in Mr. Columbo's testimony, the projects provided all information necessary to properly and expediently study the interconnection of these turbines. The truth is that National Grid had no interest

in expediting these interconnections and repeatedly asked for the same information in an effort to extend their statutory deadline and delay the projects.

Q. Please explain your position on the deadline for interconnection as provided in the current tariff.

A. The Petition presents our position clearly. Sections 3.3 defines the "Standard Process" to include every step of the process all the way through the Company's inspection of the completed interconnection. Section 3.4 clearly states that the Standard Process will take no longer than 150 days to complete. While the Company has disputed this reading of the tariff, its currently proposed amendments to the tariff seek to amend the tariff to state that the 150-day deadline is only for the production of the Interconnection Service Agreement rather than the construction of the interconnection. The proposed amendment is only more evidence of their intent to obstruct the expeditious interconnection of these turbines. We have objected that they should not be allowed to change the deadline in the midst of a dispute and that it is important to maintain a deadline for the entire process, so that the Company's gatekeeping power over the time of interconnection has defined parameters.

Q. Do you take issue with any of the factual accounts in National Grid's answer to the petition in this docket?

A. In addition to the inaccuracy of the self-serving perspective on how the process has gone generally, there are some specific, erroneous or misleading accounts of fact. Most of these are technical/process issues that will be addressed in Mr. Columbo's testimony. But, here are a few concerns: *i)* National Grid's recount of the facts associated with the

study process for COV1 and COV2 are largely unnecessary since that process was investigated under Docket 4483 and need not be revisited here; *ii)* however, it is important to understand that contrary to their presentation of the facts, COV1 and COV2 applied for interconnection together and National Grid understood the total proposed demands on the Coventry 54 substation when they released the feasibility study for COV1; *iii)* it is also important to point out that, as investigated in Docket 4483, the $30,000 fee that National Grid proposed to charge COV2 for the joint impact study of COV 1 and 2 exceeded the statutory limit, which is one reason it was not paid until that error was corrected. R.I. Gen. Laws §39-26.3-4 only allows the electric distribution utility to charge $10,000 per impact study for commercial projects and if the actual cost of the study exceeds that amount, National Grid may only recover that when the project is in operation based on an actual and accurate account of the final cost. The other very good reason the fee was not paid right away is that at that time National Grid was contesting COV1's eligibility for the DG Standard Contract program, which could have made the projects infeasible, until the Commission ruled in our favor on June 28, 2013. It is inappropriate to blame COV2 for delayed payment of an inappropriately assessed impact study fee when the Company was disputing program eligibility. These deadline issues were ultimately investigated in Docket 4483. *iv)* On page 5 of the Answer, National Grid states that $1.2 million of system upgrades were necessary to interconnect COV1 and 2. As stated above, the feasibility study for COV1 did not support that conclusion and the current study of interconnection to the 23kV circuit also clearly contradicts it. *v)* on page 6-7 of the Answer National Grid states that their August 15,

2014 letter agreement proposed to study the interconnection of the 10 turbines to "the existing 12.47kV electric distribution circuits in the area." The letter actually states that "The Combined ISRDG will analyze the impact of the projects (in the order provided) cumulatively on National Grids EPS." Our team presumed that National Grid would study the most efficient and cost effective means to interconnect the ten turbines. They evidently did not.

Q. What is your account of the facts related to the interconnection impact study for COV1 and the resulting termination of the DG Contract for that project?

A. I was shocked and dismayed when just 3 months after we petitioned the Commission for relief related to interconnection, National Grid issued a combined impact study for COV1 and 2 making it clear that we would no longer be able to afford to interconnect these turbines or get them to production in the time period required under our DG contract. The impact study was totally inconsistent with the feasibility study for COV1, even though the Company knew that those two turbines had applied for interconnection simultaneously and was, therefore, aware of the total load profile when it issued the $270,000 cost estimate in the feasibility study for COV1. On May 1, 2014, just two weeks after they issued the combined impact study, John Kennedy sent me an email (attached) in which he made it clear that "the 18-24 month estimated timeline for design and construction from time of Interconnection Service Agreement execution will not allow enough time to provide Output Demonstration Test results by February 2, 2015." National Grid was very quick to inform us that their schedule for interconnection would force termination of the DG contract for COV1 and forfeiture of the performance

guaranty deposit pursuant to the DG Standard Contract Act. Yet, they still refuse to terminate the contract so that COV1 can participate in a new enrollment.

Q. What was your reaction to the subsequently issued impact study for COV1-6?

A. It was extremely surprising and upsetting to get an impact study saying we could only interconnect one turbine to the Coventry 54 substation studied for COV1 and 2 when Mr. Kennedy had previously informed me that once I spent the $1.1 million to upgrade that substation it would have the capacity to serve up to ten turbines. That was a classic bait and switch. The $13 million price tag to interconnect 7 turbines was even much higher than our conservative budget estimate that had supposedly presumed the worst and was, therefore, clearly not feasible. And, worst of all (because it made project planning impossible), they still refused to commit to a schedule for actually interconnecting the seven turbines, which was extremely frustrating given all of the other financing and development contingencies that hinged on successful and timely interconnection. At that time we were in the midst of completing our financing and the cost and schedule for interconnection was a last remaining hurdle that we could not seem to cross even despite how much work we were putting into it. More specifically, we were angry that the Company had based the refusal of three turbines on data from the Goldwind turbine in North Kingstown rather than using the data we had supplied for the Vensys turbine. Our experts were telling us that National Grid had greatly overestimated the cost and time it should require to interconnect these turbines. The truth of their observation has been borne out by the most recent study, budget and schedule.

Q. How can you prove that National Grid specifically intended to use interconnection to hold the development of these turbines up regardless of other development schedule constraints?

A. Mostly the facts of how they have handled the proposed interconnections to Coventry substation 54 and have responded to our first and second petitions at the Commission and to our legislative initiative. As one specific, additional piece of evidence, on July 3, 2014, more than eighteen months after commencing the interconnection process in Coventry, Mr. Kennedy sent us the following warning (attached): "I understand that you intend to order equipment before receiving the completed ISRDG for the total project. We caution and urge all of our DG customers not to order equipment until they have a completed ISRDG and Interconnection Services Agreement (ISA) in hand so that they have a full understanding of required system modifications to our electric power system, construction timeline and associated costs." This was a warning that our project was not to proceed until and unless they gave it our blessing, regardless of any other development schedule issues. The development of distributed generation of renewable energy cannot be held hostage to such an oppressive interconnection regime.

Q. What specific evidence supports the conclusion that National Grid's requests for more information were not genuine efforts to understand the interconnection but were intended to prolong the statutory schedule for impact studies?

A. There is lots of such evidence, as discussed above and as will be presented in Mr. Columbo's and Mr. Peter's testimony, but I will provide three specific examples: *i)* On November 4, 2014, John Kennedy sent an email requesting more information about the

DTT lines for these turbines and seeking indemnification for our resolve not to complete an anti-islanding study in association with these turbines (attached). We had already committed to install DTT lines and anti-islanding protections for each turbine. I was confused why National Grid would dwell on these issues and seek indemnification when we had pledged to fully address the concerns. I responded on November 11 saying that we had already committed to address these issues and asking them to issue the impact study by November 15 as required by statute. *ii)* On December 14, 2014, National Grid sent an email saying that while they were working to finalize the combined impact study for COV1-6, they anticipated the need to do an additional "detailed study" afterwards. A "detailed study" is meant to be part of the impact study pursuant to section 3.4 defining the timeline for the "Standard Process" of interconnection.

Q. Why and how did the history regarding ISO-NE jurisdiction indicate National Grid's intent to obstruct your project?

A. National Grid has sought to subject these projects to additional review at ISO-NE under OP-14 and OP-18 while admitting that they are uncertain of the jurisdictional requirement for such review. This issue was first raised in November 2014 when National Grid was obligated to release its combined impact study for COV1-6. National Grid began to raise ISO jurisdictional concerns just as they were required to issue their final impact study for COV1-6, at the same time that they noted the need to do a more "detailed study." It was clearly designed to send a message that although we now have to make a commitment to interconnect at least some of your turbines, you will now be subject to another, separate review process that will further stall and may disallow even

those turbines. When our team got on a conference call with National Grid and ISO-NE on November 13,2014, it was clear that National Grid had met with ISO-NE beforehand and led them to the conclusion that it would need to exercise jurisdiction over these projects under its Operating Procedures 14 and 18. But, as we informed ISO of the specifics of the six projects, all with separate and independent interconnection points and none of which proposed to sell into the wholesale markets, ISO changed its position on jurisdiction and even National Grid ultimately admitted that ISO's role on these projects would require more study. We have told National Grid repeatedly that these are not wholesale projects – that they will either be net metered or enter into DG Contracts or enroll under the new Renewable Energy Growth tariff. None of those programs allow enrollment of projects over 5MW, the threshold for Model Generators. But, according to Tim Roughan's email of 2/23/15 (attached) National Grid apparently still classifies these projects as wholesale market projects requiring compliance with ISO OP-14 registration and operating requirements for "Model Generators." As National Grid knows, compliance with ISO's registration and operating requirements under OP-14 will cost these projects valuable time and money. National Grid must also understand that the mischaracterization of these projects for regulatory purposes will have lasting impact as precedent, requiring separately owned projects that participate in these programs and are (therefore) sized under 5MW to be classified as wholesale projects and aggregated for the sake of the application of added regulatory obligations like ISO OP-14 requirements for Model Generators. The Company now seeks to amend its interconnection tariff to make ISO review automatic in factual scenarios where ISO itself has not determined its

jurisdiction pursuant to either operating procedure. We have committed to resolve and comply with the ISO requirements if/as necessary and objected that we do not need National Grid's advocacy against our interests at ISO but can independently address and comply with ISO's requirements.

Q. What results do you seek for this interconnection process?

A. Beyond the specific relief sought in this petition, the projects have repeatedly informed National Grid that we simply need the following: 1) a commitment to interconnect all ten turbines; 2) a commitment to a reasonable schedule for the interconnection of the turbines; and 3) a reasonable method for assessing and properly allocating the responsibility for the cost of system improvements. We are finally making some progress toward these goals, but sadly it took dedication of extensive and unaffordable resources to this adjudication and to other avenues available to address relief.

Q. What is the current status of this interconnection process?

A. John Kennedy of National Grid completed a revised study in under 30 days but required us to sign a new impact study agreement to issue the revised study. It is essential for these projects to get an improved study so we can move forward but we disputed National Grid's position that we are required to enter a new study with new charges and timelines when they never properly conducted the first study for interconnecting the ten turbines. We resolved to sign a new agreement (while reserving our rights to argue that point) and an improved study was issued on February 19, 2015. National Grid has assured me that the fees for this iteration will be added together with

all previous study fees and once the study is completed and properly accounted for, the projects will only be charged the $10,000 fee per turbine ($100,000) plus any actual cost incurred to study the interconnection that exceeds that $100,000. The new study, issued February 18, 2015, is a major improvement over the Company's prior work but it still raises significant issues that need to be addressed. Those issues include: the specific account of interconnection costs and whether all should be assessed to the projects; what elements of the cost should be included for the assessment of the still disputed interconnection tax; a 17-20 month schedule that will once again disqualify COV3 and 4 from participation in the DG Contract program since those projects contracted on December 17, 2014, and must therefore produce energy no later than June 17, 2016. We are now pursuing the alternative of conducting our own much quicker and less expensive installation of an underground interconnection.

Q. You have requested an investigation of whether National Grid is fit to administer the interconnection of the distributed generation of renewable energy in Rhode Island because of its business interests – would you please explain what you mean by that?

A. This Petition asks the Commission to investigate National Grid's administration of the interconnection of the ten planned Coventry turbines. I submit that the facts related to National Grid's abuse of the interconnection process for these projects is sufficient to raise a serious question about whether National Grid has a conflict of interest in its administration of interconnection. There is certainly good cause for concern – beyond the specific facts presented in this docket, National Grid supplies natural gas to power

plants in this region that are in direct competition with renewable energy in the evolution of our new energy economy. The Company also supplies natural gas to residential customers throughout the region and, therefore, have a definite interest in maintaining the high price of natural gas, an economy that is dictated by supply and demand. Large-scale production of renewable energy, as is proposed in Coventry and our future wind projects (our business plan is to generate 150MW of power in Rhode Island over the next ten years), reduced the demand for natural gas thereby suppressing its cost. Our proposal to provide power to the public sector far below market cost is clearly threatening to National Grid's business model. Our proposal for West Warwick anticipates energy cost savings of between $20 million and $45 million depending on whether they lease or buy the turbines (differing finance rate). This is without any incentives other than the benefits of public finance. Although one might posit that Rhode Island's Decoupling Act mitigates any such conflict of interest for National Grid, that legislation was developed specifically to mitigate conflicts with efficiency investments and did not expressly address conflicts with renewables where the competitive dynamic is decidedly different. Although I am not directly familiar with all of the facts related to the history of National Grid's administration of interconnection, Mr. Anthony Callendrello, Chief Operating Officer of NEO Energy, LLC, will be testifying in support of our concerns and it is my understanding that a history of cases presented to the Commission and Division suggests other significant problems, including the interconnection of Church Community Housing's wind turbine at the Sandywoods affordable housing project. Ultimately, the Commission can and should judge whether this conflict exists in the interconnection

context and needs to be addressed, and we have requested that be done. There is no question that the Commission has jurisdiction to conduct such an investigation and provide any resulting relief if/as warranted.

Q. Does this conclude your testimony?

Yes.

nationalgrid	Wind Energy Development- Coventry Unit 1 1500kW Wind Turbine Interconnection Project Piggy Lane, Coventry, RI		RI-14319785
	FEASIBILITY STUDY		TSES-NE
	Prepared by: Andris Garsils	**March 5, 2013**	Version 1.0

A. Executive Summary:

Wind Energy Development (Renewable Interconnecting Customer) has requested that a Feasibility Study be conducted by National Grid (the Company) under the Renewable Distributed Generation Review Process per R.I.P.U.C. No.2078 Standards for Connecting Distributed Generation and National Grid's Electric System Bulletin (ESB) 756 Appendix D. The installation and interconnection of a 1500 kW wind turbine system to the Company's electric power system (EPS) has been proposed by the Renewable Interconnecting Customer. The facility is located at Piggy Lane, off of Perry Hill Road, Coventry, RI 02816.

The Renewable Interconnecting Customer has proposed to export generation as Net Purchase/Sale form. This review has been completed and has determined that this installation is feasible but with certain modifications and additions to the Company's local EPS as well as to the Renewable Interconnecting Customer's proposed installation. The Renewable Interconnecting Customer may request a follow-up Impact Study for Renewable Distributed Generation (ISRDG) in which case an executed ISRDG agreement and associated fee will be required.

B. The Company's EPS:

The Company's 12.47 kV multi-grounded radial distribution circuit, the 54F1, normally serves the area. The Coventry Substation supplies the 54F1 feeder.

a. ***Feeder(s) Information:***

i. **54F1**

1. The average peak load on the 54F1 feeder is 9.4 MVA over last 12 months. The daytime minimum load is 5.1 MVA.
2. The possibility of islanding will be determined by a system impact study.
3. Total aggregate generation interconnected/in-process to 54F1 feeder is 3,000 kW including this project.
4. The 54F1 feeder has no line voltage regulators installed outside the substation.
5. The 54F1 feeder has five (5) line reclosers.
6. The 54F1 feeder has 2,400 kVAR of capacitance installed outside the substation.

b. ***Point of Interconnection (POI):***

i. The Renewable Interconnecting Customer will be requesting a new primary metered service supplied by the 54F1 feeder. Customer has initiated Work Request # 14318708 for a new primary metered service.

ii. For this interconnection the Renewable Interconnecting Customer has proposed to connect the new primary metered service on the primary side of a new customer owned service transformer. Please refer to ESB 750 for service installation and primary meter pole installation requirements.

iii. Based on the total size of the proposed generation and character of the electric source in the area, the POI will be the line side of a customer owned gang operated disconnect switch installed ahead of the customer owned 13.8kV- 208V step-up transformer.

1. The Company will install a load break, recloser and a primary metering assembly for this installation. Customer will be responsible for any required equipment beyond this point.
2. For the typical installation of this type of system, please refer to the company's ESB 756 Appendix D Exhibit 7.

C. Renewable Interconnecting Customer's Proposed Small Generating Facility:

(Renewable Interconnecting Customer proposed design of the system is subject to change based on requirements in the ISRDG and also from the results of the Supplemental Review, if any.)

a. **Description of proposed design/configuration:**

The three-phase 1500kW wind turbine generating system consists of:

i. One(1) - Goldwind GW82, 1500 kW, 690VAC, wind turbine generator.

ii. One (1) - 690VAC/620VAC Power Converter.

iii. One (1) - Converter Control Unit with integral generator protection relaying.

iv. One (1) - 1600 kVA 12.47 kV-690/398, Delta/Wye-Grounded, generator step-up transformer.
v. One (1) - 1600 kVA 12.47 kW-12.47/7.2 kV Wye-Grounded/Delta, isolation transformer with 15 kV Class neutral grounding reactor.
vi. One (1) – 15 kV B Class, 600A, 12.5 kA Vacuum Interrupter.
vii. One (1) – Multi-Function Relay.
viii. One (1) - three phase gang operated 600A, 15 kV Class manual load break disconnect switch.
ix. One (1) – Customer owned 15 kV Class, 600A, gang operated air break switch.

D. System Modifications & Cost:

a. On the customer's property, the 1500kW Renewable Interconnection Customer to be primary metered at 12.47 kV. At the point of interconnection, there will be a load break switch, a recloser, and one (1) primary metering assembly, owned and maintained by National Grid.

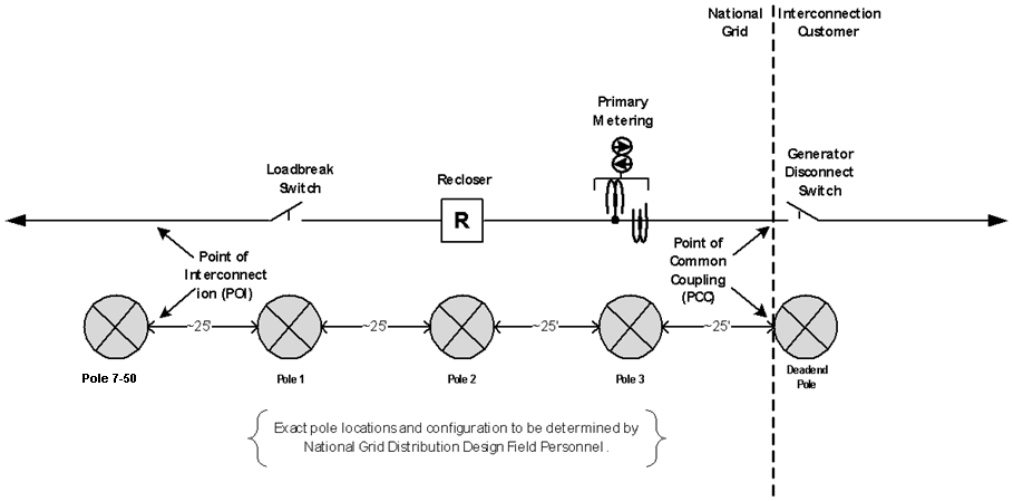

Figure 1 National Grid EPS Modifications: Typical

Feasibility Study Grade Estimate[1, 2]						
National Grid Work Item	**Conceptual Cost not including Tax Liability**				**Associated Tax Liability Applied to capital**	Total Customer Costs includes Tax Liability on Capital Portion
System Modifications	**Pre-Tax Total $**	**Capital**	**O&M**	**Removal**	**22.58%**	**Total $**
Point of Interconnection – (1) Load break, (1) Recloser, (1) Primary Metering Assembly.	$101,700	$101,700			$22,964	$124,664
Re-configure feeder; install two pole top reclosers	$110,000	$110,000			$24,838	$134,838
Replace three sets capacitor bank controls	$6,000		$6,000			$6,000
Coordination Study	$2,500		$2,500			$2,500
Witness Testing	$2,500		$2,500			$2,500
Totals	**$222,700**	**$211,700**	**$11,000**		**$47,802**	**$270,502**

[1] Feasibility Study Grade estimates are provided in good faith and based on previous experience. They were developed with a generalized understanding of the project and based upon information both provided by the Interconnecting Customer in the interconnection application and collected by Company. They are prepared using historical cost data, data from similar projects, and other assumptions. Such estimates cannot be relied upon by the Interconnecting Customer for the purposes of holding the Company liable or responsible for its accuracy as long as the Company has provided the estimate in good

[2] The associated tax effect liability is the result of an IRS rule, which states that all costs for construction collected by National Grid, as well as the value of donated property, are considered taxable income. Current tax effect rate is 22.58% for Narragansett Electric Company, d/b/a National Grid, assets.

E. Requirements/Additional Interconnection Details:

a. If the Renewable Interconnecting Customer chooses to request a follow-up ISRDG the Renewable Interconnecting Customer shall execute an ISRDG Agreement and send also submit the appropriate ISRDG Fee and continue on with the process all as outlined within R.I.P.U.C. No. 2078 Standards to Connect Distributed Generation and National Grid's Electric Service Bulletin (ESB) 756 Appendix D.

b. Screens

The answers to each of the screening question from the interconnection standard are listed below:

i. Is the point of common coupling on a radial distribution system? **Yes.**
ii. Is the aggregate generating facility capacity on the circuit less than 7.5% of the circuit annual peak Load? **No.**
iii. Does the Facility use a Listed Inverter (UL1741)? **No.**
iv. Is the Facility power rating ≤10 kWs single-phase or ≤ 25 kWs three-phase? **No.**
v. Is the Service Type Screen met? Is the Facility Listed? **TBD.**
vi. Is the starting voltage drop screen met? **N/A.**
vii. Is the fault current contribution screen met? **TBD.**
viii. Is the service configuration screen met? **TBD.**
ix. Is the transient stability screen met? **TBD.**

E. References:

a. **ESB 750**: Specifications for Electrical Installations
b. **ESB 751:** General Requirements Above 600-volt Service (*under development*)
c. **ESB 756 Appendix D for Rhode Island**: Requirements for Parallel Generation,
d. **R.I.P.U.C. No. 2078 Standards for Connecting Distributed Generation:** The Narragansett Electric Company, d/b/a National Grid, Standards for Connecting Distributed Generation (RI SCDG)

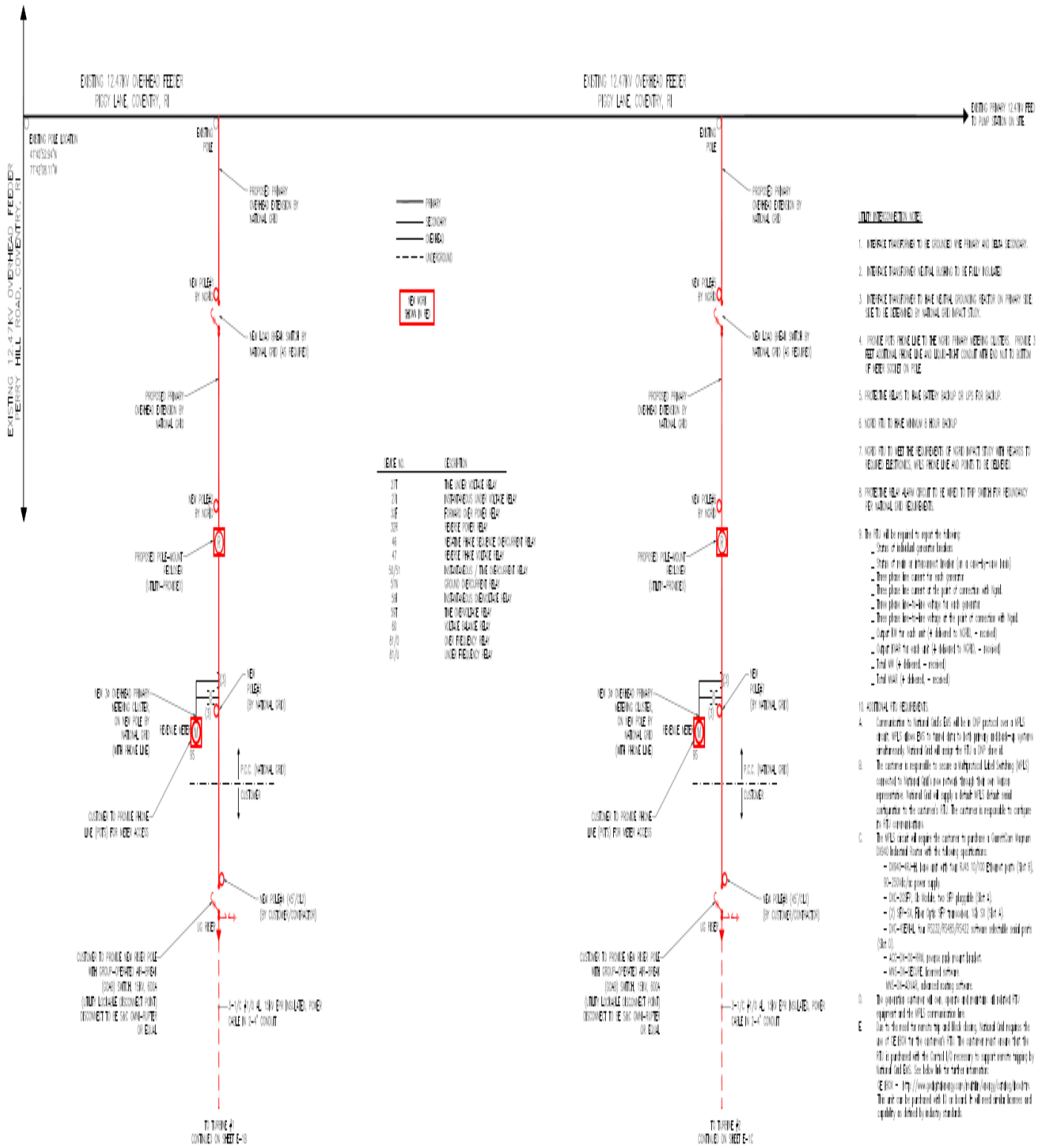

Figure 2 Customer One Line Diagram Sht 1 of 2

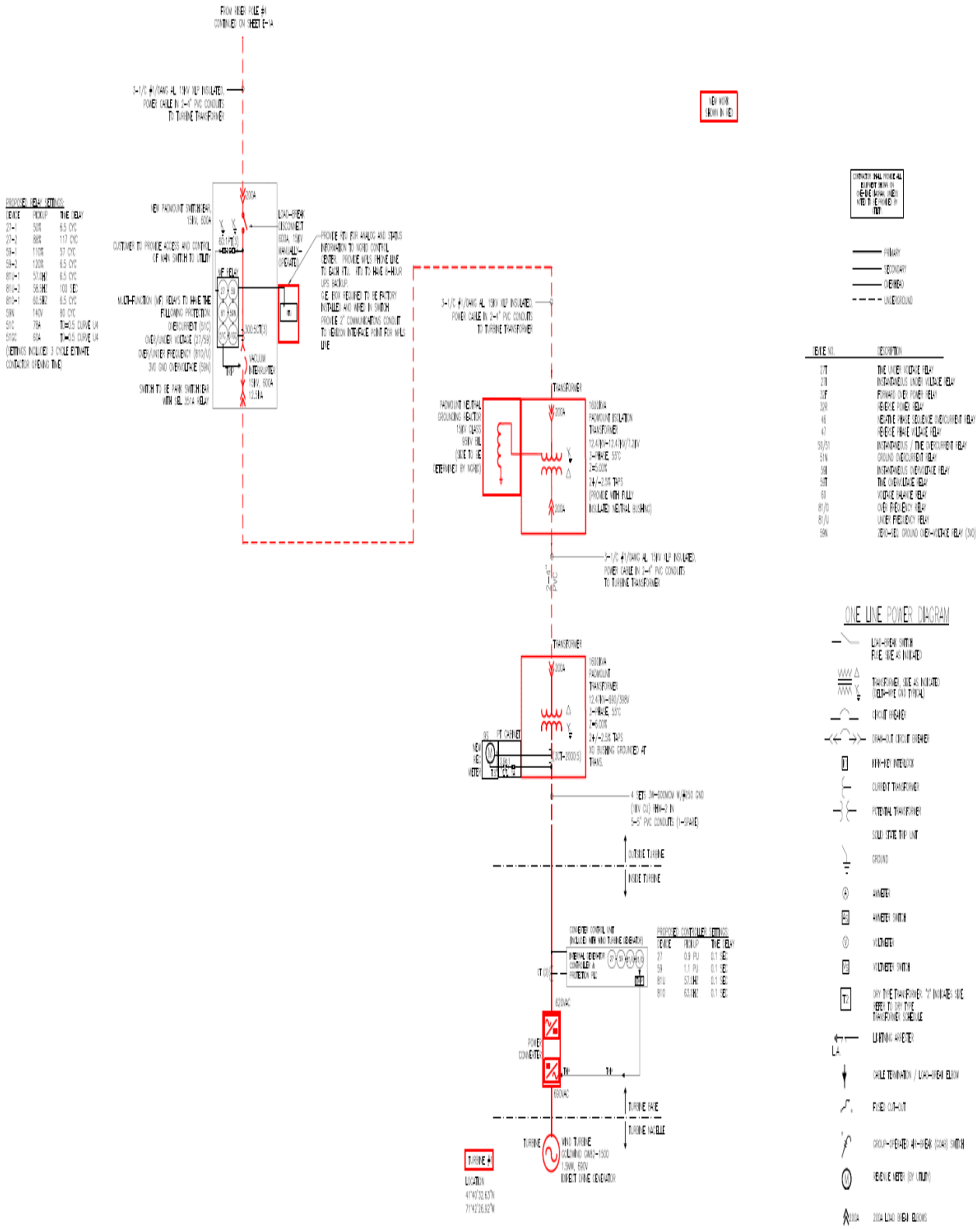

Figure 2A Customer One Line Diagram
Sht 2 of 2

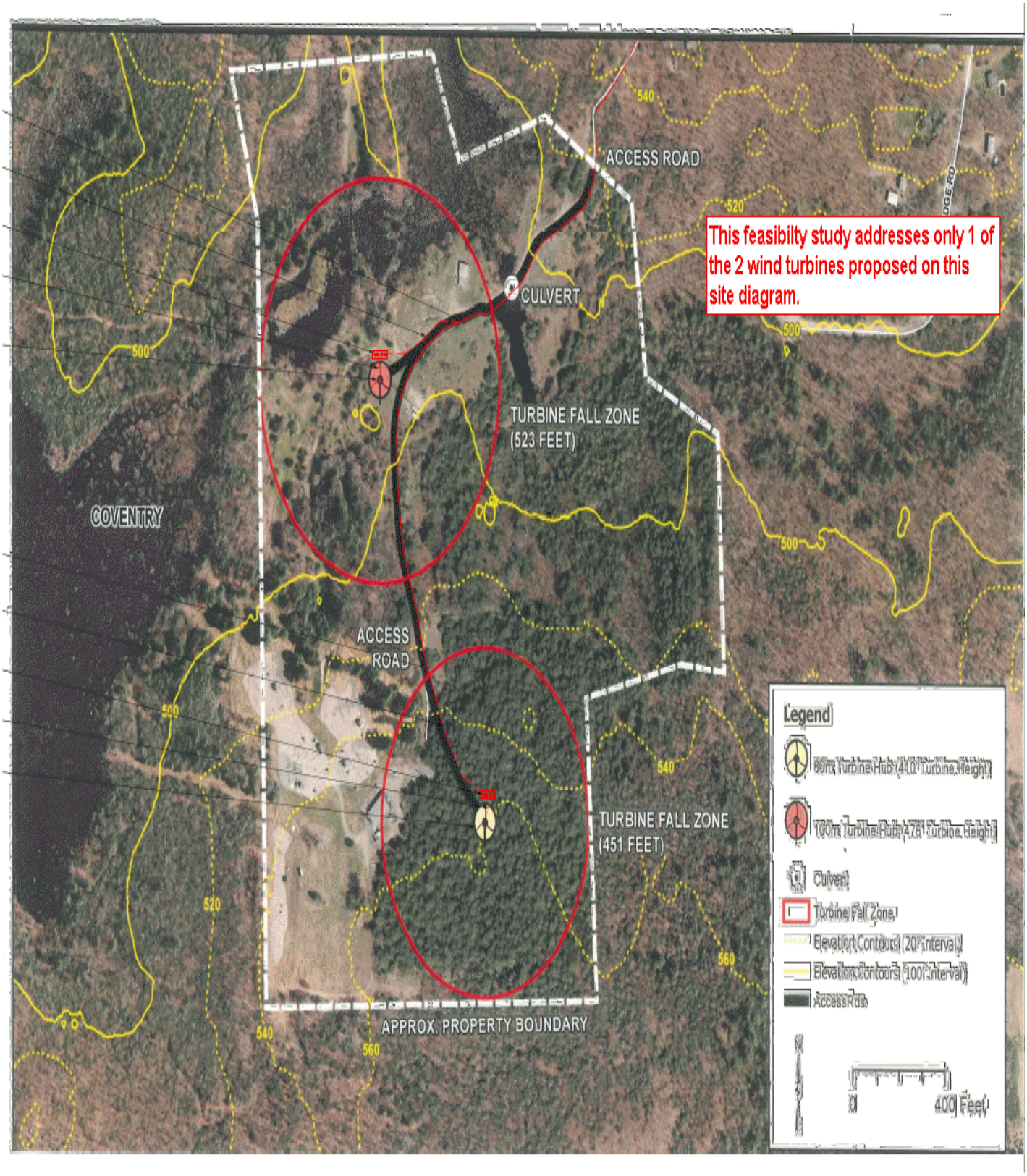

Figure 3 Customer Site Plan

System Impact Study
For
WED Coventry, LLC & WED Coventry Two, LLC
Piggy Lane.
Coventry, RI 02816

2-1500 kW Three-Phase, Converter Based Synchronous Wind Turbine Generators

Interconnection to National Grid's 12.47 kV System

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Executive Summary

National Grid ("the Company") has completed the Impact Study, for the interconnection of the WED Energy, LLC, the ("Interconnecting Customer" or "IC"), proposed total 3000 kW comprised of two (2) 1500 kW Wind Turbine Facilities ("the Facilities") to its 12.47 kV distribution system ("the Projects") and presents the conclusions of the study herein. The requirements specified are exclusive to this project and are based upon the information submitted by the IC at the time the Interconnection Applications ("IA") were submitted. Any further design changes made by the IC post IA without National Grid's knowledge, review, and/or approval will render the findings of this report null and void.

Pursuant to R.I.P.U.C. No. 2078 requirements, the proposed Facility is an Independent Power Producer ("IPP") consisting of two (2) 1500 kW (AC) ("WIND TURBINE") renewable systems. The Facilities will be located at Piggy Lane, Coventry, RI 02816 and will be connected on the customer's side of new primary metering points at the points of common coupling (PCC) on the 54F1 circuit ("Point of Interconnection" or "POI").

The purpose of this study was to:

- Conduct, as applicable, steady-state, stability, short circuit, and extreme contingency analyses and perform assessments of reliability performance of the Company's Electric Power System ("EPS") within the area of interconnection, with and without the proposed Facility, in accordance and applicable with reliability standards and study practices, and in compliance with the applicable codes, standards, and guidelines listed in Section 5.1 of the Company's *Electric System Bulletin No. 756 Appendix C: Distributed Generation Connected to National Grid Distribution Facilities Per The Massachusetts Standards for Interconnecting Distributed Generation ("ESB756D")* to determine the incremental impact and any potential adverse impacts associated with the interconnection of the Facility to the EPS.

- Determine any System Modifications required.

- Develop a planning grade cost estimate of facilities required to interconnection the Facility to the EPS.

- Provide a report describing the results of the Impact Study.

The study determined the interconnection of the Facility to be feasible with certain operating conditions. The necessary System Modifications include, but be not limited to, the installation of zero sequence overvoltage protection and Direct Transfer Trip, (DTT) at Coventry 54

substation, two new 12.47 kV primary services with metering at each Point of Common Coupling ("PCC"), and installation of a pole top recloser and load break switch between each PCC and POI. The PCC shall be at the Interconnection Customer's deadend structures on the customer's side of each of the two primary metering points, and the POI shall be at pole 49-12 off Piggy Lane.

Cost Estimates

The total estimated planning grade cost of the work associated with the interconnection of the Facility, is **$1,126,540.00** +/-25%, and includes:

System Modifications to Company EPS $907,000
Engineering, design, construction and testing for revenue
Metering, feeder modifications, reclosers, disconnect switches,
And remote stations modifications

Interconnecting Customer Interconnection Facilities ("ICIF") $22,400
Engineering review and acceptance, and compliance
Verification of the ICIFs including all required drawings
And equipment spec reviews, relay settings, and construction
And testing assistance by engineering

Tax Liability[1] $197,140
Applied to all capital associated with System Modifications

This planning grade estimate will be deemed withdrawn if not accepted by the Customer within ninety (90) calendar days of receipt of the study. **Additional costs will be involved when the required pole work takes place in Verizon Maintenance Areas and/or special environmental permitting is required. The costs associated with Verizon's work will be billed directly to the customer from Verizon. It will be the responsibility of the customer to obtain any and all easements and required permitting for work that takes place on private property.**

Estimated Schedule

The estimated duration for the Company to complete construction of the System Modifications is 18-24 months, however, the schedule driver can be impacted by unknown factors over which the company has no control. The schedule driver may be impacted by the need for

[1] The estimated tax liability was calculated using the rate at the time the estimate was completed (11.29%). Actual costs shall be reflective of the tax liability rate at the time of invoicing.

special permitting and remediation required for construction adjacent wetlands and a registered superfund site.

The interconnection schedule is contingent on the Interconnecting Customer's successful compliance with the requirements outlined in this report and timely completion of its obligations as defined in *ESB756D, Exhibit 2: Company Requirements for Projects Not Eligible for the Simplified Process*. The schedule for the Company's work shall be addressed during the development, or after the execution, of the Interconnection Agreement.

1.0 Introduction

WED Energy, LLC has requested a Distributed Generation interconnection for two (2) 1500 kW, 3000 KW total, Converter based, Synchronous Wind Turbine, renewable systems to an electrical circuit in National Grid's EPS. The Interconnection Customer's proposed In-Service date included in the Interconnection Application dated January 3, 2012 is October, 2013, however, the requested in service date is not binding.

In accordance with the R.I.P.U.C. NO. 2078 tariff, the Company has completed an Impact Study to determine the scope of the required modifications to its EPS and/or the Facility for providing the requested interconnection service.

1.1 Study Objective

The primary objectives of this Impact Study are to:

1. Identify the System Modifications necessary for the Project to reliably interconnect to the Company's system[2];

2. Identify deficiencies in the proposed Facility;

3. Identify operating restrictions;

4. Identify and describe the equipment, engineering, procurement, construction, installation, testing and commissioning work, needed to build the System Modifications and integrate them with the Interconnecting Customer's Interconnection Facilities ("ICIF");

5. Provide good faith planning grade cost estimates, within a tolerance of +/- 25%, for the System Modifications identified in Objective #1 and engineering review and acceptance of the ICIFs; and

[2]Draft design and settings may require a detailed study at a later phase in the process.

6. Provide a good faith estimate of the time required to complete the construction and installation of the System Modifications.

2.0 Project Description

2.1 Facility

As depicted in the Interconnecting Customer's Site Diagram and One Line Diagrams (*Appendix A Site Diagrams and One- Lines, Figures: 2, 3, & 4, respectively*), there will be two 1500 kW sites, for a total of 3000 kW. Each site will consist of:

Site 1 WED (RI-14319785)

- (1) Goldwind GW82-1500, 1500 kW 690V, direct drive permanent magnet, synchronous, converter based, wind turbine generator. The generator output leads to a 690V AC to 620V AC power converter.
- The output of the power converter is connected to a 1600 kVA 690V/12.47 kV step up transformer with delta primary and wye-grounded secondary windings. The output of the step up transformer is connected to a 1600 kVA 12.47 kV/12.47 kV isolation transformer with wye reactively grounded primary and delta secondary windings. A pad mounted 15 kV class neutral reactor is also connected to the neutral of the isolation transformer.
- The output of the isolation transformer is connected to a 15 kV class, 600A vacuum interrupter controlled by a SEL 351A multi-function relay.
- The output of the vacuum breaker is connected to a pole mounted, gang operated three phase, 15 kV class, 600A, lockable, load break switch. The Pole Mounted disconnect switch will connect to National Grid's Electric Power System (EPS) through a pole mounted primary metering assembly.

Site 2 WEDII (RI-14462941)

- (1) Goldwind GW82-1500, 1500 kW 690V, direct drive permanent magnet, synchronous, converter based, wind turbine generator. The generator output leads to a 690V AC to 620V AC power converter.
- The output of the power converter is connected to a 1600 kVA 690V/12.47 kV step up transformer with delta primary and wye-grounded secondary windings. The output of the step up transformer is connected to a 1600 kVA 12.47 kV/12.47 kV isolation transformer with wye reactively grounded primary and delta secondary windings. A pad mounted 15 kV class neutral reactor is also connected to the neutral of the isolation transformer.
- The output of the isolation transformer is connected to a 15 kV class, 600A vacuum interrupter controlled by a SEL 351A multi-function relay.

- The output of the vacuum breaker is connected to a pole mounted, gang operated three phase, 15 kV class, 600A, lockable, load break switch. The Pole Mounted disconnect switch will connect to National Grid's Electric Power System (EPS) through a pole mounted primary metering assembly.

The facilities will export power as they are proposed to be independent power producers. Once all documentation have been received, National Grid will issue a request for bidirectional meters that are adequate for net metering.

2.2 Service Configuration

The proposed location of the Facilities are normally served by National Grid's 7.2/12.47 kV three-phase, 4 wire, multi grounded wye, effectively-grounded EPS.

Based on the Project design at the time the study was performed, the Interconnection Facilities shall consist of a 3-phase line extension from pole 49-12, off Piggy Lane, Coventry, RI onto the property and to two (2) PCCs, one for RI-14319785 and one for RI-14462941. Pole 49-12 off Piggy Lane will be considered the POI for both projects. The line extension will be constructed by National Grid, and shall consist of seven (7) poles, approximately 700' of line, two (2) load break switches, two (2) pole-top reclosers, and two (2) primary metering assemblies, and all associated equipment to be located on the private property. (*See Appendix B-Interconnection Configuration & EPS Modifications*, *Figure 5: POI & PCC Configuration)*. The area of the proposed POI and PCC is near wetlands and a registered superfund site, additional permitting and special soil remediation methods may be required.

In accordance with the National Grid Specifications for Electrical Installations ("ESB 750 Series"), the Interconnection Customer shall install the deadend pole directly after each primary metering assembly, and the Company shall frame it, deadend its conductors, and install anchors and guys. On each deadend pole, the Interconnection Customer shall install a gang operated disconnect on the pole, and complete connections from the switch to the Company's conductors. (Additional detail is provided in ESB756D, Section 5.4.1.3 and Exhibit 7.)

The Point of Common Coupling (PCC) will be designated as the Customer side of the aforementioned connections. National Grid will install bi-

directional meters once all required documentation has been received. The Company's Design Personnel will determine the exact location of the Company's facilities and the customer's dead end pole. The Interconnecting Customer shall be responsible for obtaining all easements required for the line extension in accordance with the Company's requirements.

2.3 Area EPS

This area is normally supplied by National Grid's 54F1 feeder that originates out of National Grid's Coventry substation, a 12,470 V multigrounded and effectively grounded distribution feeder.

There are three sets of line fuses between the POI and substation, Pole 49 Perry Hill Rd, Pole 38 Perry Hill Rd, and Pole 35 Old Summit Rd. For an interconnection of this size, these single phase line fuses will cause coordination problems and must be replaced with reclosers. For this project the Line fuses on pole 49 Perry Hill Rd will be replaced with a recloser on pole 49-50 Piggy Lane, the line fuses on pole 38 Perry Hill Rd will be removed, and the fuses on pole 35 Old Summit Rd will be replaced by a recloser at the same location and a fused cutout (40K) will be installed on pole 50 Perry Hill Rd. (*See Appendix B- Interconnection Configuration & EPS Modifications*, *Figure 6: 54F1 Modifications)*.

The ability to generate is contingent on the proposed DG Facility being served by the 54F1 feeder during normal operating conditions. Under abnormal operating conditions, or if it is not supplied by the 54F1 feeder, it is not guaranteed that the DG Facility will be allowed to operate.

The current 54F1 characteristics are as follows:

- The daytime loading on 54F1 feeder has varied between a peak of 9.3 MVA and a minimum of 2.5 MVA, at time of expected maximum generation, over the past year.

- Total aggregate generation interconnected/in-process on the 54F1 feeder is 1500 kW including this application at this time.

- The 54F1 feeder is regulated by single phase regulators located within the substation and has no additional voltage regulators installed outside the substation between the POI and the substation.

- The 54F1 has five (5) existing line reclosers installed outside the substation. One (1) is installed between the POI and the substation feeder breaker.

- The 54F1 feeder has 1800 kVAR of capacitance installed outside the substation.

Location	Size (kVAR)	Control
P 107 Hill Farm Rd / Coventry	600	T/V
P 63 Victory Hwy / Coventry	600	T/V
P 577 Flat river Rd / Coventry	600	T/V

Table 1 - 54F1 Capacitor Locations

No capacitor modifications are required as a result of this interconnection.

2.4 Revenue Metering Requirements

If not already provided, the Interconnecting Customer shall provide a telecommunication line to National Grid's revenue meters in accordance with ESB756D, Section 5.4.2. The Customer should provide an analog /POTS (Plain Old Telephone Service) phone line to each National Grid owned revenue meter location. The phone line must be capable of direct inward dial without human intervention or interference from other devices such as fax machines, etc. National Grid will specify, test, install, and own the voltage and current transformers necessary to meet the metering requirements for this project. (See *Appendix C - Outdoor Meter Installations, Figures 7- 8: Revenue Meter Phone Line Installation Guide)*

The Interconnecting Customer is responsible for all costs associated with the line construction

3.0 Power Flow Analysis

The power flow analysis was substantially performed using CYMDIST. A model of the 54F1 circuit was developed based on data extracted from the National Grid GIS and field verified on March, 2013.

The analysis considered cases at minimum and peak load, at time of expected maximum generation for the following cases:

- The 54F1 in a normal configuration Peak load of 9.3 MVA @ 94% PF Lagging

- The 54F1 in normal configuration Min load of 2.5 MVA @ 99 % PF Leading.

3.1 General Loading Analysis

An analysis of the feeder loading, with and without the wind turbine system operating, was performed and demonstrated that the addition of the DG Facility will not create thermal loading problems on the 54F1 circuit, or at Coventry Substation. Specifically, no conductor, or transformer overloads occur. All National Grid owned mainline conductor and distribution facilities are thermally large enough to accommodate the added capacity from the 1500 kW Wind Turbine facility.

3.2 Reverse Power Flow

The possibility of the Facility causing reverse power flow into the Company's EPS was reviewed. At peak export (i.e., 1500 kW), the excess generation from the Facility will be absorbed by the 54F1 circuit.

3.3 Voltage Analysis

The supply circuits are regulated and therefore the Company is obligated to hold voltages at customer service points to defined limits in ANSI Standard C84.1- 2006. The Wind Turbine interconnections shall not contribute to greater than a 3.0% change in voltage on the EPS under any conditions.

In summary, there are no reports of overvoltage conditions on the Company's EPS with the generation interconnection site at full power during studied cases.

The Company will not be held liable for any power quality issues that may develop with any customers as result of the interconnection of this generation.

3.4 Flicker Analysis

The *IEEE Recommended Practice for Measurement and Limits of Voltage Fluctuations and Associated Light Flicker on AC Power Systems*, IEEE Std. 1453-2004 provides guidance on flicker and voltage fluctuations.

Based upon the Flicker Data received on January 16, 2014, the predicted flicker and voltage fluctuations are expected to be acceptable.

4.0 Short Circuit and Protection Analysis Company Facilities

The Company performed a protection review of WED Energy, LLC proposed interconnection of a 1500 kW Wind Turbine, converter based generator to the 54F1, a 12.47 kV distribution circuit served from Coventry Substation. This review will identify EPS enhancements that are necessary to complete the interconnection project and its ability to meet R.I.P.U.C. NO. 2078 interconnection tariff and the requirements of The Company's ESB 756D. The protection impact study will address the following items:

4.1 Temporary Over-Voltages on Transmission Supply

Detailed analysis of the load to generation match on the Coventry T1 supply transformer, which supplies the 54F1 circuit, during minimum load and maximum generation conditions indicates that both facilities combined poses significant risk of causing temporary over-voltage condition to develop on the 23 kV system. Consequently, zero sequence overvoltage protection will be required to be installed on the 23 kV side of the Coventry, 23 kV- 12.47 kV Grd-Y/7.2 kV, supply transformer (T1).

4.2 Fault Current Contributions

Tables 2 & 3 summarize the generation effect on fault current levels at each PCC for Facility 1 and Facilities 1 & 2 combined, respectively. These fault currents are within existing equipment ratings and will not upset existing device coordination on the feeder. The customer is responsible for ensuring that their own equipment is rated to withstand the available fault current according to the NEC and National Grid ESB 750, which specifies that the fault current should be no more than 80% of the device interrupting rating.

Fault Duty Pre and Post Project
RI -14319785 With 15 Ohm Neutral grounding Reactor

Pre-Project:			Post-Project				
Fault Location	Fault Type	Pre-Project Amps	Post-Project Amps	*Δ%	System Impedance @ PCC Post Project		
12.47 kV Substation Bus	Line to Grd	4039	4113	1.83%	Positive Sequence Impedance (Ω)	Negative Sequence Impedance (Ω)	Zero Sequence Impedance (Ω)
	Three Phase	3443	3530	2.53%			
12.47 kV PCC RI-14319785	Line to Grd	NA	900	NA	1.248+j4.079	2.988+j 6.074	4.191+j11.611

	Three Phase	NA	1191	NA			
*Δ% = (Post-Pre)/Pre							

Table 2 - Fault Current Levels (in amperes) Facility 1 (RI-14319785)

Fault Duty Pre and Post Project RI -14319785 & RI - 14462941 Combined 15 ohm Neutral Grounding Reactor on each Isolation Transformer							
Pre-Project:			Post-Project				
Fault Location	Fault Type	Pre-Project Amps	Post-Project Amps	*Δ%	System Impedance @ PCC Post Project		
					Positive Sequence Impedance (Ω)	Negative Sequence Impedance (Ω)	Zero Sequence Impedance (Ω)
12.47 kV Substation Bus	Line to Grd	4039	4167	3.17%			
	Three Phase	3443	3610	4.85%			
12.47 kV PCC RI-14319785	Line to Grd	NA	1038	NA	0.704+j3.017	2.996+j6.079	2.778+j9.631
	Three Phase	NA	1288	NA			
12.47 kV PCC RI-14462941	Line to Grd	NA	1009	NA	0.761+3.092	3.160+j6.208	2.899+j9.949
	Three Phase	NA	1256	NA			
*Δ% = (Post-Pre)/Pre							

Table 3 Fault Current Levels (in Amperes) Facilities 1 & 2 Combined (RI-14319785 & RI-14462941 Combined)

The 12.47 kV system impedance shown at the PCC and is in ohms. The value is taken from the model developed using ASPEN Oneliner. The model was based on the proposed installation of a neutral grounding reactor with an impedance of 15 ohms on the primary neutral of each of the customer's proposed 1600 kVA, 12470V Y – 12470V Delta isolation transformers, each with a 5% impedance, where, each is in series with a 12470 V Delta - 690 V Grd-Y/ 398 V generator step-up transformer, each with an impedance of 6%. Refer to (*Appendix A Site Diagrams and One-Lines, Figures: 2, 3, & 4, respectively*). If a different configuration is used other than that depicted in the one-line of record, provided for evaluation, the Short Circuit and Protection Analysis will need to be re-evaluated.

The customer is responsible for ensuring that their equipment is rated to withstand the available fault current.

5.0 Protection Analysis Customer Facilities

The protection review consisted of a review of customer's transformer connection and protection scheme and assessment of protection and transfer trip requirements. This Facility shall comply with the relevant provisions of R.I.P.U.C. NO. 2078 Dec 2009 and requirements of ESB-756D, as applicable. Please note that applicable sections of ESB-756D are referenced for information purposes and may not comprise the entirety of applicable sections. The key requirements for this Project include, but are not limited to:

5.1 Disconnect Switch

Per ESB 756D, Section 5.6 & R.I.P.U.C. NO. 2078: The Facility shall provide a disconnect switch (or comparable device mutually agreed upon by the Parties) at the point of Facility interconnection that can be opened for isolation. The switch shall be in a location easily accessible to Company personnel at all times. The switch shall be gang operated, have a visible break when open, be rated to interrupt the maximum generator output and be capable of being locked open, tagged, and grounded on the Company side by Company personnel. The Company shall exercise such right in accordance with Section 7.0 of the interconnection tariff.

The Customer's one-line shows the required disconnect switch and meets the requirement. The Customer must provide the Company with 24/7 unlimited access and control of this switch.

5.2 Unintentional islanding

Inverters/converters shall be in compliance with ESB 756D 5.7.10.1 Photovoltaic Generation and R.I.P.U.C. NO. 2078 section 4.2.1 General requirements, where all inverters must be IEEE 1547 compliant and UL-1741 certified inverters shall be equipped with an internal anti islanding scheme and active under voltage (27), over voltage (59), zero sequence over voltage (59N), under frequency (81U) and over frequency (81O) relays.

The Goldwind converters are not UL 1741-2005/ IEEE1547 compliant. Analysis indicates that there is likely ability for these facilities to remain in operation in excess of 2 seconds should and islanding condition develop.

5.3 Direct Transfer Tripping

Refer to section 5.2 above, a direct transfer tripping system, if one is required by either the Interconnecting Customer or by the Company, shall use equipment generally accepted for use by the Company and shall, at the option of the Company, use dual channels.

DTT will be required for this interconnection, the requirements are as follows:

- National Grid's Standard is model S00763PF which uses the Guard Before Trip feature for DTT applications.

- The generator breaker should be tripped for relay/breaker Loss of Potential (LOP), Relay failure, loss of Guard signal, and receive the trip signal. Relay failure, LOP and loss of guard signal should have a 30s delay to trip the breaker. This is to avoid nuisance tripping due to the system transients.

- Since National Grid does not specify the relay type, any timer that is equivalent to an ABB RXKL1 is acceptable.

- When the order actually takes place, both the transmitter and receiver should be ordered from RFL as a package.

- Even if there are different orders for the transmitter and the receiver, the receiver order from the customer and the transmitter order from National Grid, RFL needs to be informed of this to insure that the two devices will talk to each other. RFL will test them together before shipping to National Grid/customer.

- National Grid will also specify all trip and guard frequencies. National Grid uses default settings of the groups 3 and 5 to set the guard and trip frequencies.

    - Group 3:
      Tone 1 Tx: 1540Hz (trip) 1690Hz (Guard)
      Tone 1 Rx: 2030Hz (Trip) 1880Hz (Guard)

    - Group 5:
      Tone 2 Tx: 2220 Hz (Trip) 2370 Hz (Guard)
      Tone 2 Rx: 2710Hz (Trip) 2560 Hz (Guard)

5.4 Interconnection Interrupting Device

In accordance with ESB 756D, Sections 5.7.2 and 5.7.10.1

The Customer's one-line meets the above requirement.

5.5 Synchronizing Devices

The project is inverter/converter based, not applicable.

5.6 Transformers

The Company reserves the right to specify the winding connections for the transformer between the Company's voltage and the Facility's voltage (Interface Transformer) as well as whether it is to be grounded or ungrounded at the Company's voltage. **Refer to ESB-756D section 5.7.**

This project has two proposed facilities, each with a 1600 kVA, 12.47 kV, reactively grounded Wye, primary, with a fully insulated and isolated neutral with a 12.47 kV Delta secondary, with an impedance of 5.0%, isolation transformer, in series with a 1600 kVA, 12.47 kV, Delta primary, with a 690 V Grd-Y /398 V secondary, with an impedance of 6.0% generator step-up, (GSU), transformer.

The proposed configurations are acceptable provided each isolation transformer is grounded through its own 15 ohm neutral grounding reactor.

5.7 Voltage Relays

Voltage relays shall be frequency compensated to provide a uniform response in the range of 40 to 70 Hz. Refer to ESB 756D section 5.7.6. For a primary wye (high side) / delta (low side) transformer, requires voltage sensing on the delta winding. This can be accomplished using wye-grounded / wye-grounded VTs connected to the delta.

The existing one line depicts primary voltage sensing on the wye primary of each isolation transformer, where (27, 59, & 51C 51GC elements), on each SEL 351A relay control each primary main breaker at each facility. The one-line does not meet the requirement. Voltage sensing must be placed on the delta winding

5.8 Overcurrent Relays

Per section 5.7.8 of the ESB 756D Overcurrent protection is required on the high side of the DG Customer's interface transformer to detect faults on the Company's EPS. Voltage controlled overcurrent elements (51C) are required for both phase and ground. At a minimum, these relays shall utilize voltage sensing via Yg-Yg VTs on the transformer's secondary or primary to detect the single line-to-ground faults on either the primary or secondary sides of the transformer. The 51C elements shall trip the high side/or low side interrupting device. Typical 51C pickup setting are generally less than rated generation output and in this application the use of **US Extremely inverse (U4) TCC is preferred** .

The one-line shows the required 51C elements, however, the settings must be altered (Pickups lowered) to meet the above requirements.

5.9 Protective Relay Hard-Wire Requirement:

Unless authorized otherwise by the Company, protective relays must be hardwired to the device they are tripping. Further, interposing computer or programmable logic controller or the like is not permitted in the trip chain between the relay and the device being tripped.

The customer's one-line must be updated to meet these requirements.

5.10 Protective Relaying Redundancy

Refer to ESB 756D converter-based WIND TURBINE Generator Equal or Above 500k. The relays at the inverter terminal shall provide the redundant protection for voltage and frequency elements. However, the relay equipped for overcurrent protection has no redundancy, National Grid requires that the relay alarm contact should be wired to trip the switchgear when the relay fails, not in service or the DC supply voltage to the relay is lost. There will be 2s time delay in tripping the switchgear. A timer needs to be added to the switchgear's trip circuit or the internal relays must be programmed to include the delay.

An updated stamped one-line must be submitted satisfying this requirement.

5.11 Protective Relay Supply

Refer to ESB 756D section 5.7.10.4. Where protective relays are required in this Section, their control circuits shall be DC powered from a battery and battery charger system. Solid state relays shall be self-powered, or DC powered from a battery and battery charger system. If the Facility uses a

Company-acceptable non-latching interconnection contactor, AC powered relaying may be allowed provided the relay and its method of application are fail safe, meaning that if the relay fails or if the voltage and/or frequency of its AC power source deviate from the relay's design requirements for power, the relay or a separate fail-safe power monitoring relay acceptable to the Company will trip the generator, after a 2 second time delay, by opening the coil circuit of the interconnection contactor.

The relay control power has not been shown to be battery powered, a new one-line must be submitted that meets the requirement.

5.12 Current Transformers ("CT")

Refer to ESB 750C section 5.7.4.1. CT ratios and accuracy classes shall be chosen such that secondary current is less than 5 amperes and transformation errors are consistent with Company practices.

The one-line shows 300:5 CTs and meets requirement.

5.13 Voltage Sensing and Voltage Transformers ("VT")s and Connections

Transformer options based on the selected transformer configuration to detect the Under Voltage, and provide voltage detection for a voltage controlled over current (51C) element. Refer to ESB 756D sections 5.7.4.2 and 5.7.8. For a primary wye-reactively grounded isolation transformer with a secondary delta transformer in series with a delta primary – wye grounded secondary generator step-up transformer: At a minimum, wye-grounded - wye-grounded VTs shall be installed on the transformer's delta to detect line to ground faults. If it is within the relay's capability, the relay may be direct connected to the transformer delta.

The one-line shows 60:1 VTs configured Y grounded – Y grounded, connected to the primary wye of the isolation transformer, but lacks the required Y grounded – Y grounded VTs on the delta windings of the isolation and GSU transformers. A new one-line must be submitted that meets this requirement.

5.14 High-Speed Protection

The Facility may be required to use high-speed protection if time-delayed protection would result in degradation in the existing sensitivity or speed of the protection systems on the Company's EPS.

High speed protection is not required.

5.15 Service Entrance Equipment

The Interconnection Customer shall furnish, install, own, and maintain service entrance equipment in accordance with applicable requirements set forth in ESB 750, Section 5, and ESB756D, Section 5.4.1.3 and Exhibit 7.

The Customer's project one-line meets the above requirement.

5.16 Surge-Withstand capability

The interconnection system shall have the capability to withstand voltage and current surges in accordance with the environments defined in IEEE Standard C62.41.2-2002 or IEEE Standard C37.90.1-2002 as applicable.

5.17 Additional Requirement

The R.I.P.U.C. No. 2078, requires that, the Distributed Resources (DR) cease to energize the area EPS within 2 seconds, refer to IEEE1547 and UL1741. The Interconnection system's response to abnormal frequencies. Section 4.2.3.2.1 requires that NPCC Directory 12 Figure 1 Curve "Standards for Setting Underfrequency Trip Protection for Generators" for the Eastern Interconnection be followed. It is important that clearing time should be the time that the relay trips plus breaker operating time.

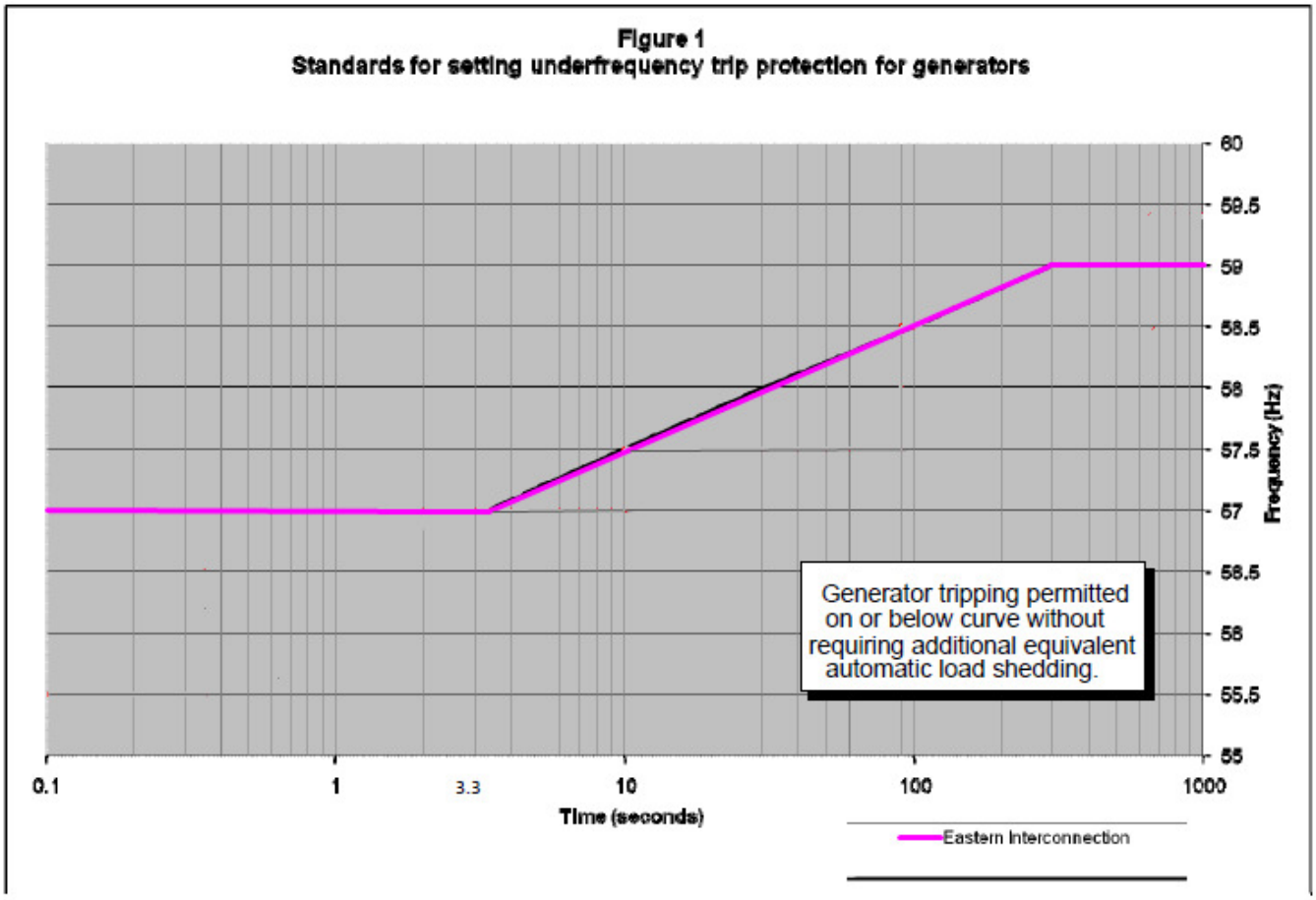


Figure 1: NPCC Directory 12 Figure 1 Curve

The under frequency setting points should also comply with the NPCC standard for setting under frequency trip protection. Per the NPCC Directory 12 Figure 1Curve, if the setting falls above the curve, there must be an equivalent amount of load shed when tripped, which in this case cannot be done and therefore the 81 under frequency must be set on or below the curve. Per NPCC Directory 12 Figure 1 Curve for the Eastern Interconnection:

The inverters/converters', and or, generator's internal relays shall also meet the NPCC Directory 12 Figure 1 Curve requirements for the Eastern Interconnection.

The IC must submit a PE stamped one-line that provides the inverters' internal relay settings.

The submitted settings for the generators' internal settings do not meet the requirements of Figure 1 above and a new PE stamped one-line with corrected settings must be submitted for review and approval.

5.18 Protection Scheme Assessment

The customer must submit a PE stamped one line which includes the required redundant relay settings, inverter internal relay settings, and meets all the requirements specified within this document, to the Company for review and approval before an interconnection application can move forward.

6.0 Telemetry and Telecommunications

The IC is an Independent Power Producer (IPP) and consequently no RTU is required.

7.0 Inspection, Compliance Verification, Customer Testing, and Energization Requirements

7.1 Inspections and Compliance Verification

For this study, the DG Facility is deemed as an Independent Power Producer pursuant to applicable RI state jurisdictional requirements. A municipal electrical inspection approval certificate from the local authority having jurisdiction is required of the DG Customer's facilities (i.e. primary service entrance conduit, primary switchgear, wiring, and generation equipment). The Company must receive the DG Customer's Draft set of installation drawings, equipment data, and test plan for the functional verification tests at least four (4) weeks before the Company's field audit.

The DG Customer shall adhere to all other Company related verification and compliance requirements as set forth in the applicable ESB 750 series documents. These and documented acceptance testing requirements of these facilities will be specified during the Draft design review of the Project prior to the Company's field audit and energization.

7.2 Testing and Commissioning

The Interconnection Customer shall submit initial relay settings to the Company no later than twenty-one (21) calendar days following the Company's acceptance of the Facility's service connection's Draft MA state licensed professional engineer sealed design. If changes/updates are necessary, the Company will notify the Interconnection Customer three (3) business days after the initial relay settings were received, and the Interconnection Customer shall submit the revised settings within seven (7) calendar days from such notification. Within three (3) business days of receipt of the proposed Draft relay settings, the Company shall provide comments on and/or acceptance of the settings. If the process must continue beyond the above evolution due to errors in the relay settings, the Company retains the right to extend the Testing and Commissioning process, as needed, to ensure the Draft relay settings are correct.

Assuming no major issues occurring with the relay settings, the Interconnection Customer shall submit a Testing and Commissioning Plan (TCP) to the Company for review and acceptance, no later than forty-five (45) calendar days following the Company's acceptance of the Facilities Draft design. The TCP must be Finalized, including Company acceptance, no later than six (6) weeks prior to functional testing.

7.3 Energization and Synchronization

The "Generator Disconnect Switch" at the interconnection point shall remain "open" until successful completion of the Company's field audit and witness testing. Prior to the start of construction, the DG Customer shall designate an Energization Coordinator (EC), and prepare and submit an Energization Plan (EP) to the Company for review and comment. The energization schedule shall be submitted to the Company and communicated with the Company's local Regional Control Center at least two (2) weeks in advance of proposed energization. Further details of the EP and synchronization requirements will be specified during the Draft design review of the Project.

The DG Customer shall submit as-built design drawings to the Company 90 days following commercial operation of their DG Facility.

8.0 Cost Estimates

The non-binding good faith cost planning grade estimate for the Company's work associated with the interconnection of this Facility to the EPS, as identified in this report, is **$1,126,540.00** +/-25%, and includes:

RI-14319785 & 14462941						
National Grid Work Item	Conceptual Cost +/-25% Planning Grade Cost Estimate not including Tax Liability				Associated Tax Liability $ @ Applied to capital	Total Customer Costs includes Tax Liability on Capital Portion
System Modifications NECO	Pre-Tax Total $	Capital	O&M	Removal	22.58%	Total $
54F1 Modifications Install reclosers on pole 49-50 Piggy Ln and pole 35 Logbridge Rd Install Loadbreak on pole 38 Perry Hill	$133,000.00	$127,000.00	$6,000.00	$0.00	$28,680.00	$161,680.00
Install zerosequency OV protection on Covetry 23- 12.47 kV Grd-Y /7.2 kV supply transformer and DTT on 54F1 feeder recloser	$491,000.00	$463,000.00	$28,000.00	$0.00	$104,550.00	$595,550.00
Build 3 Phase line extension from Pole 31 onto customer property, included in this work is the installation of (1) Loadbreak switch , (1) recloser, and (1) Primary Metering assembly. Also includes pole replacements P30, P31, & P32 Reynolds Rd	$283,000.00	$283,000.00	$0.00	$0.00	$63,910.00	$346,910.00
SUBTOTAL System Modifications NECO	**$907,000.00**	**$873,000.00**	**$34,000.00**	**$0.00**	**$197,140.00**	**$1,104,140.00**
Interconnecting Customer Interconnection Facilities ("ICIF")	**Pre-Tax Total $**	**Capital**	**O&M**	**Removal**	**22.58%**	**Total $**
Witness Testing	$5,000.00	$0.00	$5,000.00	$0.00	$0.00	$5,000.00
EMS Integration	$5,600.00	$0.00	$5,600.00	$0.00	$0.00	$5,600.00
Program Management	$1,800.00	$0.00	$1,800.00	$0.00	$0.00	$1,800.00
Review and Implementation of protective device settings	$10,000.00	$0.00	$10,000.00	$0.00	$0.00	$10,000.00
SUBTOTAL	**$22,400.00**	**$0.00**	**$22,400.00**	**$0.00**	**$0.00**	**$22,400.00**
	Pre-Tax Total $	**Capital**	**O&M**	**Removal**	**Tax Liability**	**Total $**
TOTALS	**$929,400.00**	**$873,000.00**	**$56,400.00**	**$0.00**	**$197,140.00**	**$1,126,540.00**

Table 4 - Cost Estimates

This **$1,126,540.00 +/- 25%total** planning grade estimate is based on information provided by the Interconnecting Customer for the study, and is prepared using historical cost data from similar projects. The associated tax effect liability included is the result of an IRS rule, which states that all costs for construction collected by

National Grid, as well as the value of donated property, are considered taxable income.[3]

This estimate is valid for ninety (90) calendar days from the issuance of this report. If the Interconnection Customer elects to proceed with this project after the ninety (90) calendar days, a revised estimate may be required.

9.0 Conclusion

The project was found to be feasible. It will be allowed to interconnect with certain modifications and additions to the local National Grid distribution Electric Power System (EPS) the Interconnecting Customer's equipment. The estimated planning grade cost for the Company's work associated with the Project is **$1,126,540.00** +/- 25%.

The present interconnection configuration and protection scheme submitted for review must be modified to meet National Grid's specific protection requirements. The customer must submit a PE stamped electrical one-line along with the required relay settings, that meets all the requirements specified within this document, to National Grid for review and approval, before an interconnection application can move forward.

A Detailed Study with +/- 10% estimates may be required if the total project cost, less tax liability, is greater than $500,000. The Company shall issue a Detailed Study Agreement for execution if required.

A milestone schedule shall be included in the Interconnection Agreement and shall be reflective of the tasks identified in ESB756D, Exhibit 2. Upon execution of the Interconnection Agreement, and prior to advancing the project, the Interconnecting Customer shall provide a detailed project schedule, inclusive of the Exhibit 2 tasks referenced above. After completion of Draft design and all associated applications, fees, permitting and easement requirements are satisfied, System Modifications for this Project will be placed in queue for construction.

If an Interconnecting Customer fails to meet the R.I.P.U.C. No 2078, Section 3.4 Time Frames and does not provide the necessary information required by the Company within the longer of 15 days or half the time allotted to the Company to perform a given step, or as extended by mutual agreement, then the Company may terminate the application and the Interconnecting Customer must re-apply.

[3] Actual charges shall include the tax rate in effect at the time the charges are incurred.

Note: Authorization for parallel operation will not be issued without a fully executed Interconnection Agreement, receipt of the necessary insurance documentation, and successful completion of the Company approved witness testing. Such authorization shall be provided in writing.

10.0 Revision History

Version	Date	Description of Revision
1.0	04/17/14	Final for RI-14319785/14462941, WED & WEDII Energy, LLC

Appendix A IC Site and One-line Diagrams

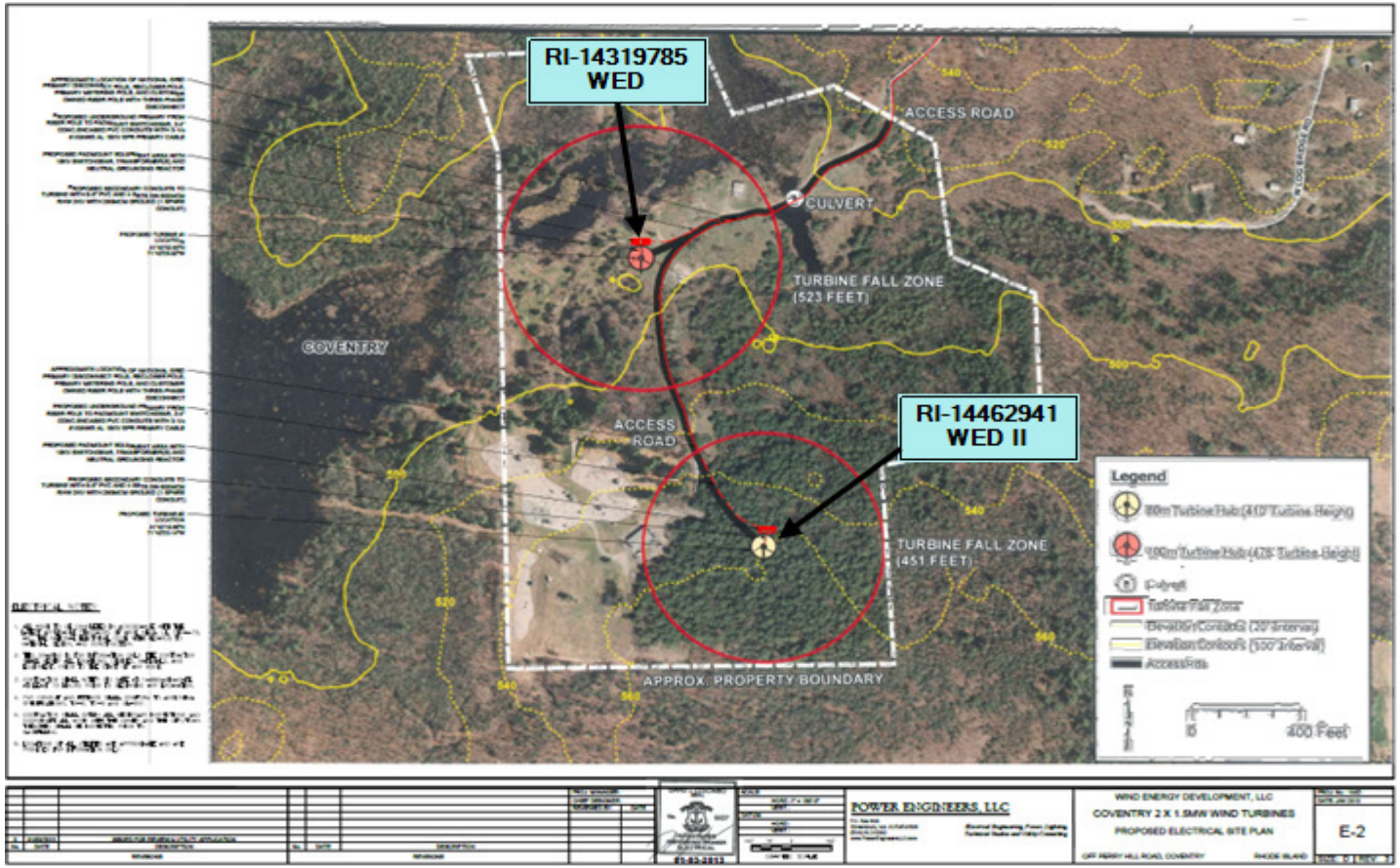


Figure 2: Site Diagram

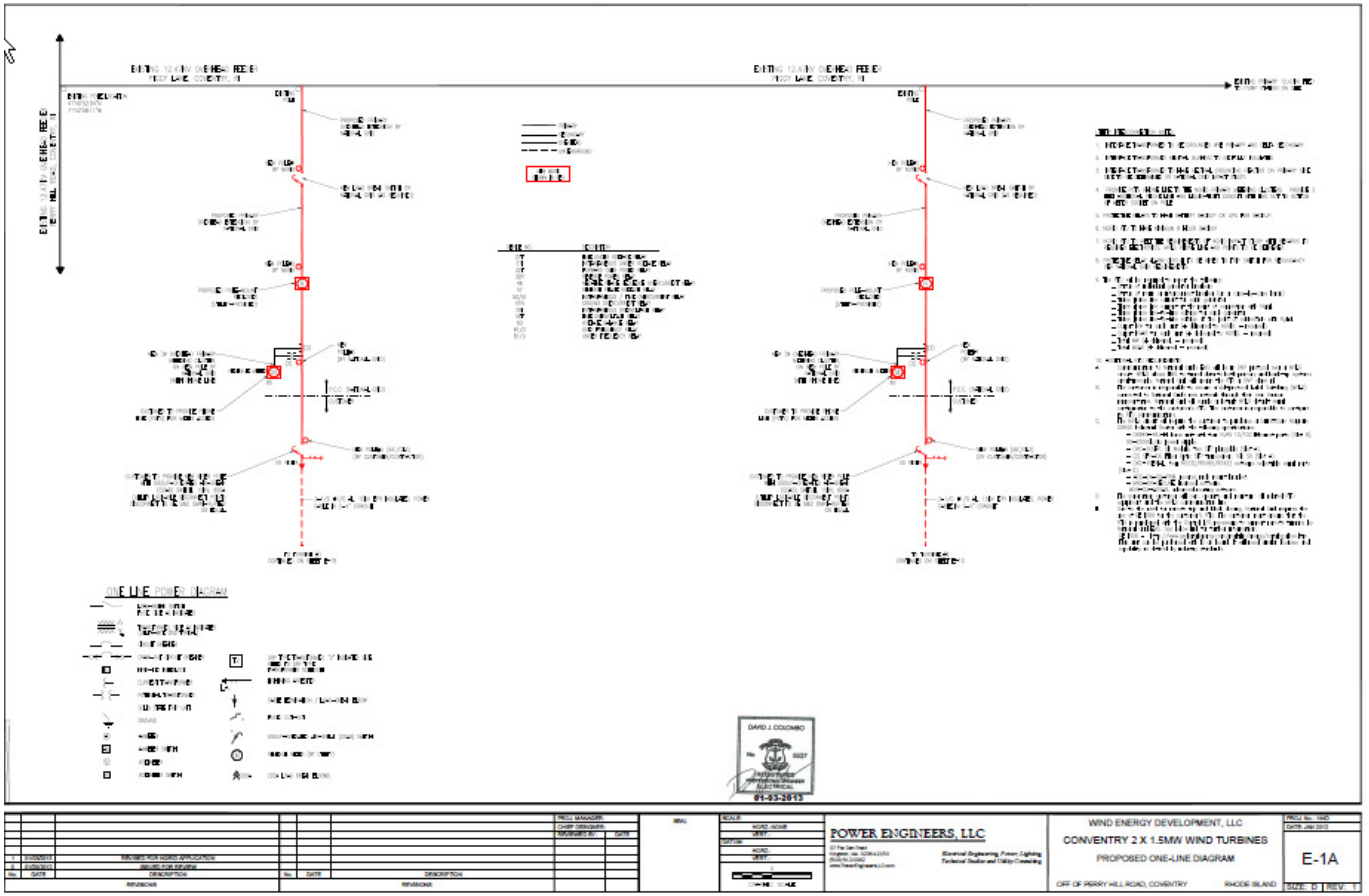


Figure 3: Project One-Line

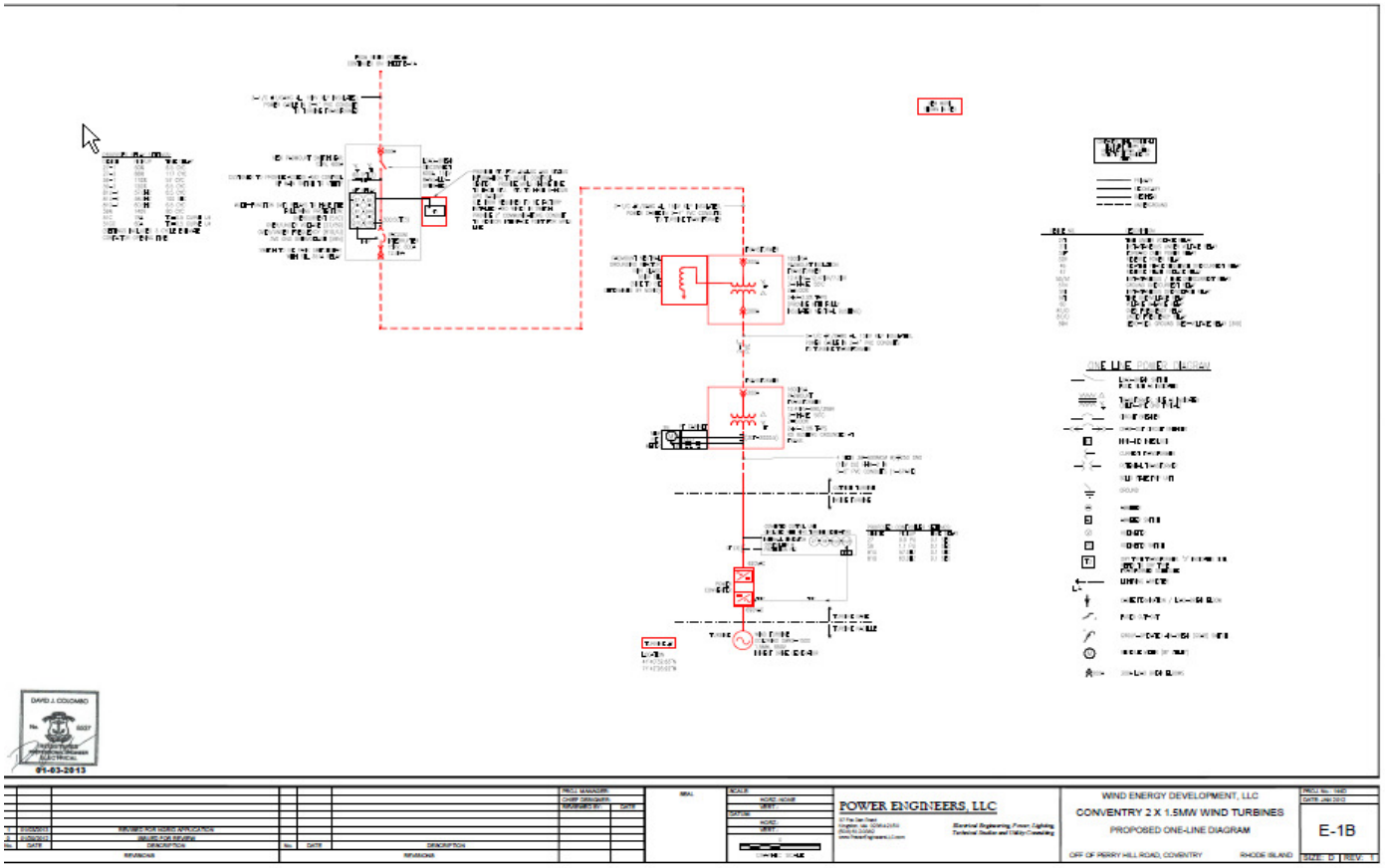


Figure 4: Project One-Line

Appendix B Interconnection Configuration & EPS Modifications

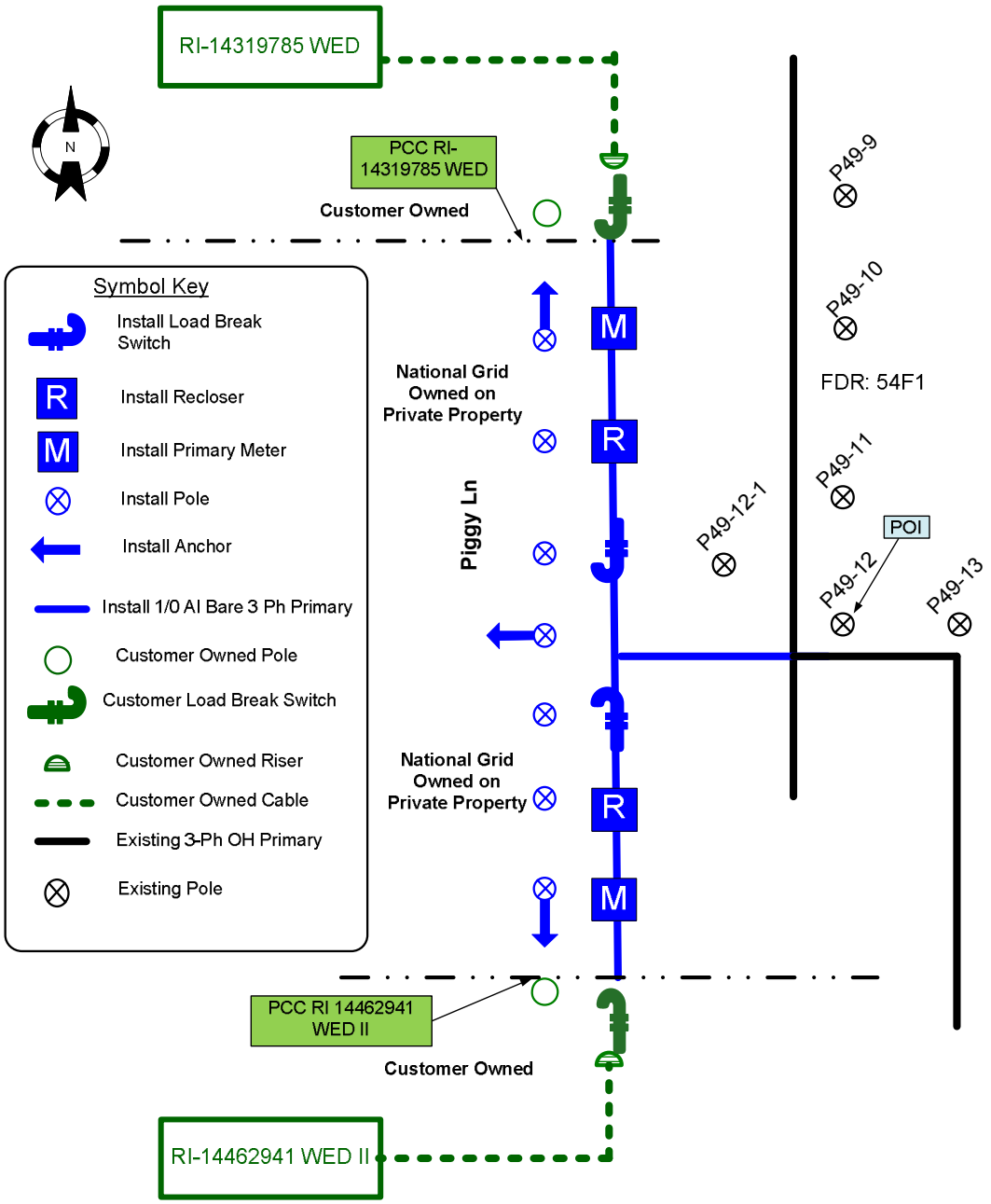


Figure 5: POI – PCC Configuration

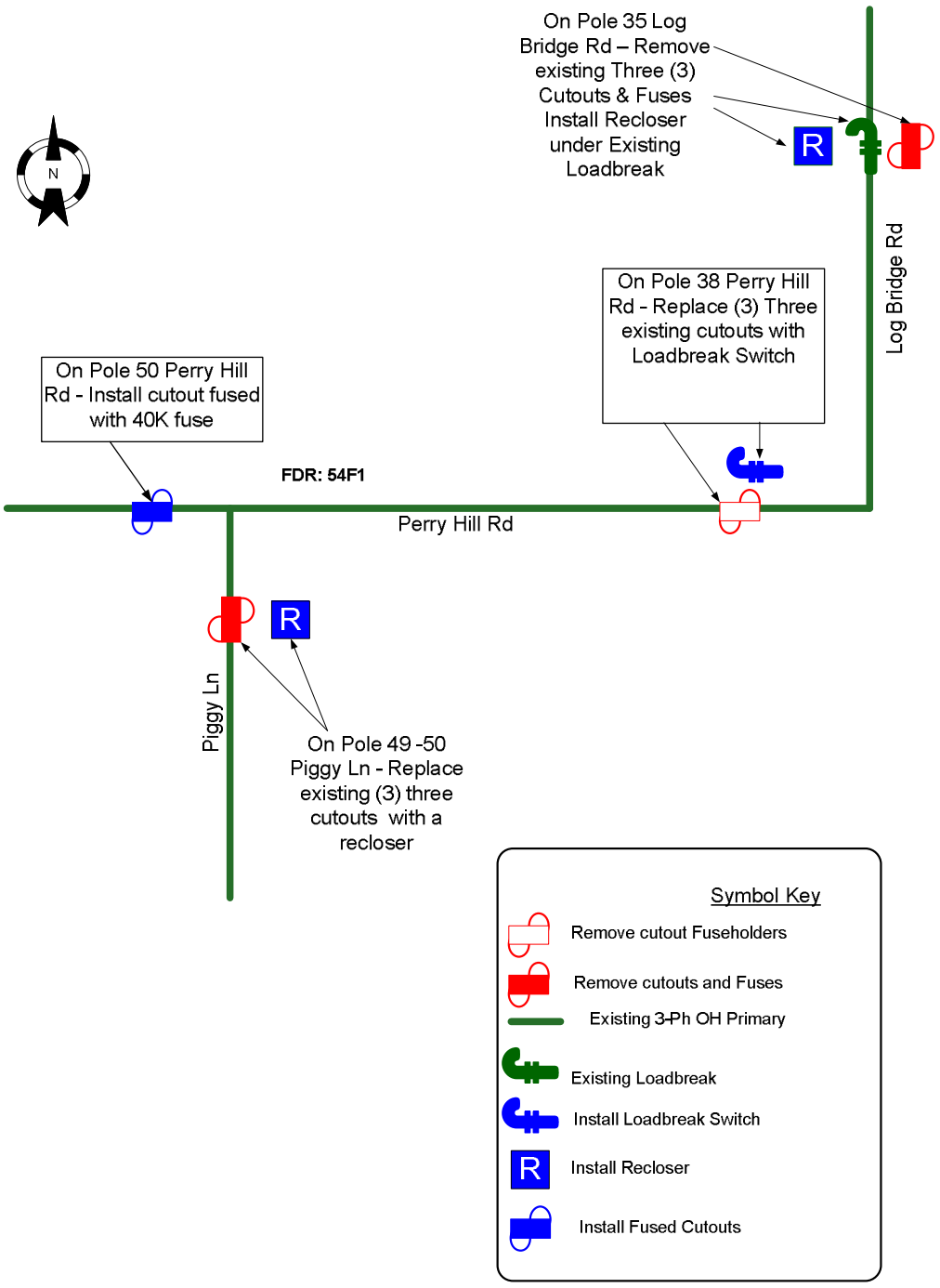


Figure 6: 54F1 Modifications

Appendix C Outdoor Meter Installations

REVENUE METERING PHONE LINE INSTALLATION GUIDE

An analog phone line to National Grid's revenue meter shall be provided by the Customer. The analog phone line must be capable of direct inward dial without human intervention or interference from other devices such as fax machines, etc. The phone line can be a phone (extension) off the customers PBX phone system, or it may be a separate dedicated phone line as provided by the Telephone Company. The following is to be used as a guide, please contact the Company if additional information is required. The most common installations are outlined below, Wall mounted Meter Installation, Outdoor Padmount Transformer Meter Installation, and Outdoor Pole Mounted Meter Installation.

1) WALL MOUNTED METER INSTALLATION
If the meter is wall mounted indoor or outdoor the customer shall provide a telephone line within 12" of the meter socket and additional equipment as described and shown below in figures 1A & 1B. National Grid will connect the meter to the customer provided phone line.

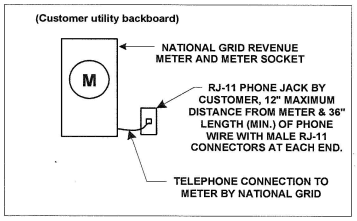


Figure 1A – Indoor Meter Installation
not to scale

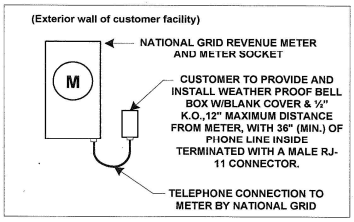


Figure 1B – Outdoor Meter Installation
not to scale

2) OUTDOOR PADMOUNT TRANSFORMER METER INSTALLATION
If the meter is mounted outside on the secondary compartment of the padmount transformer as shown below the conduit shall stub up and roughly line up with the bottom or side knock out of the meter socket and terminate into a weatherproof box or fitting. A liquid tight flexible conduit whip with end bushing and locknut of sufficient length to reach and terminate at the knockout location of the meter socket with three feet of telephone wire coiled (and terminated with a male RJ-11 connector) at its end shall be connected to the weatherproof box or fitting. National Grid will connect the conduit whip to the meter socket and terminate the telephone wire to the meter (see figure 2 below).

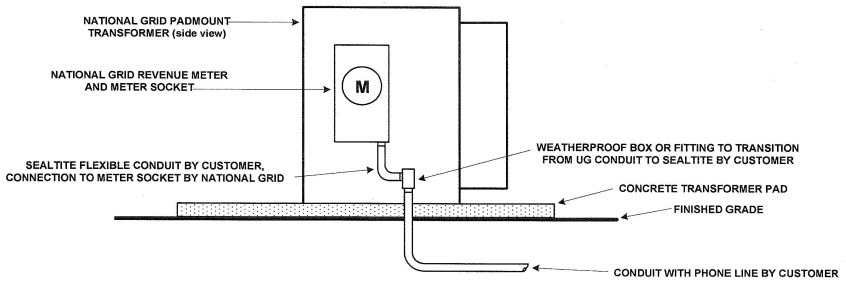


Figure 2 – Outdoor Padmount Transfomer Meter Installation
not to scale

Figure 7: Revenue Meter Phone Line Installation Guide (1 of 2)

3) OUTDOOR POLE MOUNTED METER INSTALLATION
If the meter is located outdoor on a Company owned utility pole as part of a primary metering installation the Customer will install and connect a phone line from the Telephone Company provided termination interface box, the line shall be terminated with a RJ-11 male connector and be of sufficient length to reach the meter socket and create a drip loop, as well as additional line for final connection to the meter. The customer is responsible for the Telephone Company phone line installation. (see figure 3 below).

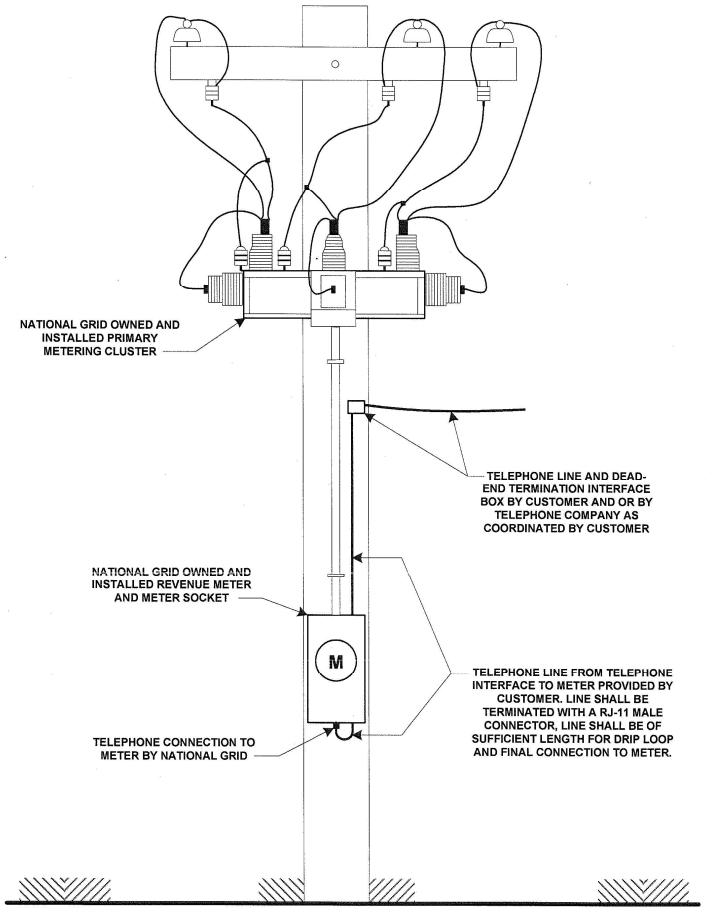


Figure 3 – Outdoor Pole Mounted Meter Installation
not to scale

Figure 8: Revenue Meter Phone Line Installation Guide 2 of 2

nationalgrid

August 14, 2014

Mr. Mark DePasquale
Wind Energy Development, LLC
3760 Quaker Lane
North Kingstown, RI 02852

Re: Letter of Understanding: Combined Impact Study for Renewable Distributed Generation; WED Coventry One, LLC; WED Coventry Two, LLC (2, 2a and 2b); WED Coventry Three, LLC; WED Coventry Four, LLC; WED Coventry Five, LLC; WED Coventry Six, LLC (6, 6a and 6b) – Six Projects

Dear Mark:

WED Coventry One, LLC; WED Coventry Two, LLC; WED Coventry Three, LLC; WED Coventry Four, LLC; WED Coventry Five, LLC; WED Coventry Six, LLC ("Interconnecting Customers") have expressed an interest in obtaining a Combined Impact Study for Distributed Generation ("ISRDG") from The Narragansett Electric Company d/b/a National Grid ("National Grid" or "Company").

The Interconnecting Customers have four existing interconnection applications in progress and has recently submitted two new interconnection applications. The six interconnection applications represent six separate Points of Interconnection for six separate projects.

Two of the existing applications, WED Coventry 1 & 2, have a completed combined ISRDG. The other two existing applications, WED Coventry 3 & 4, have completed Feasibility Studies. The two new interconnection applications are for WED Coventry 5 & 6.
The Interconnecting Customers have changed the design of WED Coventry Two which requires a revised study for WED Coventry 1 and 2. ISRDG's are required for WED Coventry 3 through 6 to progress. The Interconnecting Customer and the Company have agreed that a combined ISRDG for all six applications is in the best interest of all parties.

The Interconnecting Customers and the Company have agreed to an ISRDG Study fee in the amount of $50,000.00. This amount is in accordance and representative of the ISRDG Study fee amounts found in Table 2 in Section 3.5 of the interconnection tariff, R.I.P.U.C. No. 2078 Standards for Connecting Distributed Generation. In essence, each of the six WED Coventry interconnection applications carries an ISRDG Study fee of $10,000.00. In theory, the Company has agreed with the Interconnecting Customers to revise the existing ISRDG for WED Coventry 1 and 2 at no cost and charge the ISRDG Study fee of $10,000 for each of the remaining five applications; arriving at the $50,000.00 fee.

The order in which you have prioritized the six projects is: WED Coventry 2(2a, 2b), 3, 4, 1, 6(6a,6b), and 5. The Combined ISRDG will analyze the impact of the projects (in the order provided) cumulatively on National Grids EPS. If this order or total installation is altered (removing one or more wind turbine generators from the total project) it may require an additional study and associated fee.

If this letter accurately reflects your understanding, and you wish to proceed with the Combined ISRDG, please have a duly authorized representative of Wind Energy Development, LLC sign and return this letter, along with the ISRDG Study Agreement.

I look forward to working collaboratively with you in the successful completion of these projects.

Agreed,

Wind Energy Development, LLC

By: Mark DePasquale KB Date: 8/15/14

Name: Mark DePasquale
Phone: 401-580-2060
Email: md@wedenergy.com

The Narragansett Electric Company d/b/a National Grid

By: _____ Date: _____

Name:
Phone:
Email:

System Impact Study
For WED LLC
RI-14318785 – One, (1), 1,500 kW, three Phase, Converter Based Synchronous, Wind Turbine, WED1
RI-14462941 - Three, (3), 1,500 kW, three Phase, Converter Based Synchronous, Wind Turbines,WED 2
RI-15640455 - One, (1), 1,500 kW, three Phase, Converter Based Synchronous, Wind Turbine,WED 3,
RI-15772951 - One, (1), 1,500 kW, three Phase, Converter Based Synchronous, Wind Turbine,WED 4,
RI-17599370 - One, (1), 1,500 kW, three Phase, Converter Based Synchronous, Wind Turbine,WED 5
RI-17600293- Three, (3), 1,500 kW, three Phase, Converter Based Synchronous, Wind Turbines,WED 6

Various Locations in Coventry, RI 02816

Ten, 1,500 kW, Three-Phase, Converter Based, Synchronous Wind Turbine Generators, 15,000 kW total

Interconnection to National Grid's 23 kV System

Table of Contents

Section **Page**

Executive Summary

National Grid ("the Company") has completed a Combined Impact Study for Renewable DG (ISRDG), for the interconnection of the WED LLC, the ("Interconnecting Customers" or "IC"), proposed total 15,000 kW, comprised of ten (10) 1,500 kW Wind Turbine Facilities ("the Facilities") to its 23 kV sub-transmission system ("the Projects") at six separate Points of Interconnection (POI) and presents the conclusions of the study herein. This study was done outside of the Standard Process procedures in the Company's Standards for Connecting Distributed Generation (RIPUC 2078) as agreed to by the IC and the Company during a meeting held on January 15th, 2015. The requirements specified are exclusive to this project and are based upon the information submitted by the IC to date.

The proposed Facilities are Independent Power Producers ("IPP") consisting of ten (10)1,500 kW (AC) ("WIND TURBINE") renewable systems. The Facilities will be located at West Log Bridge Rd and Flat River Rd Coventry, RI 02816 and proposed to be connected on the customer's side of six new primary metering points, at the points of common coupling (PCC) at various locations on the Company's 2232 circuit.

WED 1 (RI-14319785), WED 2 (RI-14462941), WED 3 (RI-15640455), WED 4 (RI-15772951), WED 5 (RI-17599370) and WED 6 (RI-17600293).

The purpose of this study was to:

- Conduct, as applicable, steady-state, stability, short circuit, and extreme contingency analyses and perform assessments of reliability performance of the Company's Electric Power System ("EPS") within the area of interconnection, with and without the proposed Facility, in accordance and applicable with reliability standards and study practices, and in compliance with the applicable codes, standards, and guidelines listed in Section 5.1 of the Company's *Electric System Bulletin No. 756 Appendix D: Distributed Generation Connected to National Grid Distribution Facilities Per The Rhode Island Standards for Interconnecting Distributed Generation ("ESB756D")* to determine the incremental impact and any potential adverse impacts associated with the interconnection of the Facility to the EPS.

- Determine any System Modifications required.

- Develop planning grade cost estimates of the required facilities for interconnection of those Facilities found capable to be interconnected to the EPS.

- Provide a report describing the results of the Impact Study.

- Provide additional detail concerning any recommended further study.

The study determined the interconnection of the Facilities to be feasible with certain operating conditions. The necessary System Modifications include but are not limited to:

- An extension of the 2232 circuit
    - Overbuild on the existing 54F1 circuit (~5.8 Miles):
        - West from Pole 9003 to Pole 486 Log Bridge Rd. This route runs mainly along Flat River Road, with a small segment at the end along Old Summit Road.
        - North from Pole 486 Log Bridge Rd to Flat River Road, and then West along Flat River road to Pole 572-50 to the POIs for WED 3 and WED 4.
        - South from Pole 486 Log Bridge Rd, along Log Bridge, then continuing down West Log Bridge to the last Pole on this road, Pole 16.
    - Brand new construction/extension of the 2232 (~1.7 Miles):
        - South from Pole 16 West Log Bridge to the POIs for WED 2, WED 6 the final POI for WED5.

- Six new 23 kV primary metering installation services, ahead of the Points of Common Coupling, with new bidirectional meters, reclosers, loadbreak switches, and necessary conductor and equipment to extend 3 phase primary down to the PCCs from the POIs.

- Along the path of the new services for each wind turbine, and the new 23 kV primary along the West Log Bridge Road extension, the customer is required to clear trees and vegetation as required and to provide a suitable means of access to the company's equipment. This section of public roadway is to be brought up to the current standards to handle heavy duty vehicular traffic, as well as maintained year round for 24/7 access to Company equipment.

- Significant tree trimming/tree clearing is potentially required in order to upgrade existing distribution equipment (for instance Log Bridge Road). To complete possible vegetation management, Town/land owner approval is required. If this approval is not received the line extension route may have to be revised to accommodate. This will be determined during the work management design.

- The customer is required to provide all required easements for new poles on private property along the proposed path of construction. Final locations will be determined during the work management design and may be relocated from their current proposed locations.

- The wind turbine machines should operate at no greater than 100% to -99% (absorbing VARs) power factor. To do otherwise may create voltage excursions and power quality problems for the 2232 circuit.

    - This is based upon the expected turbine generator output as provided by Vensys, the turbine manufacturer. Operation other than the expected results may require additional study at a later date and new operational requirements if power quality issues arise once the system is brought online and operational.

- Once the wind turbine machines are online and generating, the Customer is required to submit periodic generation data (every three months for the first year) for National Grid's review in order to discern if the machines are in fact operating as expected and required. This data should be for the wind turbine system as a whole.

- Final site plans and one lines, addressing all comments within this document, are required prior to issuing the Interconnection Service Agreement.

Cost Estimates:

The total estimated planning grade cost of the work associated with the interconnection of the Facility, is **$5,366,600.00**+/-25%, and includes:

System Modifications to Company EPS $4,532,600.00
Engineering, design, construction and testing for revenue Metering, feeder modifications, reclosers, disconnect switches, And remote stations modifications

Interconnecting Customer Interconnection Facilities ("ICIF") $15,000.00
Engineering review and acceptance, and compliance Verification of the ICIFs including all required drawings And equipment spec reviews, relay settings, and construction And testing assistance by engineering

Tax Liability[1] $819,000.00

Applied to all capital associated with System Modifications

This planning grade estimate will be deemed withdrawn if not accepted by the Customer within ninety (90) calendar days of receipt of the study. **Additional costs may be involved if the required pole work takes place in Verizon Maintenance Areas. These costs will be billed directly to the customer from Verizon.**

Estimated Schedule:

The estimated duration for the Company to complete construction of the System Modifications is 17-20 months, however, the schedule driver can be impacted by unknown factors over which the company has no control. **Verizon pole sets are dependent upon Verizon's schedule. The Company has no control over Verizon's work schedule. It will be the responsibility of the customer to obtain any and all easements and required permitting for work that takes place on private property, as well as secure the new roadway construction of the expansion of West Log Bridge Road.**

The schedule driver may be impacted by the ability to have planned outages to allow work to take place on the supply system. Outages will be contingent on the ability to support the load normally supplied by affected circuits. The schedule can also be impacted by unknown factors over which the Company has no control, such as inclement weather.

The interconnection schedule is contingent on the Interconnecting Customer's successful compliance with the requirements outlined in this report and timely completion of its obligations as defined in *ESB756D, Exhibit 2: Company Requirements for Projects Not Eligible for the Simplified Process*. The schedule for the Company's work shall be addressed during the development, or after the execution, of the Interconnection Service Agreement.

1.0 Introduction

WED LLC has requested the interconnection of ten, (10), 1,500 kW, 15,000 kW total, converter based, synchronous wind turbine, renewable systems onto to a 23 kV circuit in National Grid's.

[1] The estimated tax liability was calculated using the rate at the time the estimate was completed (22.84%). Actual costs shall be reflective of the tax liability rate at the time of invoicing.

In accordance with the R.I.P.U.C. NO. 2078 tariff, the Company has completed an Impact Study to determine the scope of the required modifications to its EPS and/or the Facility for providing the requested interconnection service.

1.1 Study Objective

The primary objectives of this Impact Study are to:

1. If possible, identify the System Modifications necessary for the Project to reliably interconnect to the Company's system[2];
2. If possible, identify deficiencies in the proposed Facility;
3. If possible, identify operating restrictions;
4. If possible, identify and describe the equipment, engineering, procurement, construction, installation, testing and commissioning work, needed to build the System Modifications and integrate them with the Interconnecting Customer's Interconnection Facilities ("ICIF");
5. If possible, provide additional detail in terms of scope of additional required study to determine final system modifications, cost estimates, and construction timelines for the interconnection of all or some proposed facilities.

2.0 Project Description

2.1 Facility

As depicted in the Interconnecting Customer's Site Diagram and One Line Diagrams (*Appendix A Site Diagrams and One- Lines*), there will be ten, (10),1,500 kW wind turbines, for a total of 15,000 kW.

WED 1 (RI-14319785)

[2]May require additional study at a later phase in the process.

- (1) Vensys SDL, 1,500 kW 690V, direct drive permanent magnet, synchronous, converter based, wind turbine generator. The generator output leads to a 690V AC to 620V AC power converter.
- The output of the power converter is connected to the low voltage side of a 1600 kVA 23 kV ungrounded wye primary / 620V/323V grounded-wye secondary (Z=6%, assumed X/R=5) interface transformer.
    - NOTE: The grounding transformer is no longer required and should be removed from the one line diagram.
- The primary side of the interface transformer is connected to a 25 kV class, 600A vacuum interrupter controlled by a SEL 351A multi-function relay.
- The high side of the vacuum breaker is connected to a gang operated three phase, 15 kV class, 600A, lockable, load break switch. The disconnect switch will connect to National Grid's Electric Power System (EPS) through a pole mounted primary metering assembly.

WED 2 (RI-14462941)

- (3) Vensys SDL, 1,500 kW 690V, direct drive permanent magnet, synchronous, converter based, wind turbine generator. The generator output leads to a 690V AC to 620V AC power converter.
- The output of each power converter is connected to the low voltage side of a 1600 kVA 23 kV ungrounded wye primary / 620V/323V grounded-wye secondary (Z=6%, assumed X/R=5) interface transformer.
    - NOTE: The grounding transformer is no longer required and should be removed from the one line diagram.
- The primary side of each of the three, (3), interface transformers is connected in parallel to one, (1), 25 kV class, 600A vacuum interrupter controlled by a SEL 351A multi-function relay.
- The high side of the vacuum breaker is connected to a gang operated three phase, 15 kV class, 600A, lockable, load break switch. The disconnect switch will connect to National Grid's Electric Power System (EPS) through a pole mounted primary metering assembly.

WED 3 (RI-15640455)

- (1) Vensys SDL, 1,500 kW 690V, direct drive permanent magnet, synchronous, converter based, wind turbine generator. The generator output leads to a 690V AC to 620V AC power converter.

- The output of the power converter is connected to the low voltage side of a 1600 kVA 23 kV ungrounded wye primary / 620V/323V grounded-wye secondary (Z=6%, assumed X/R=5) interface transformer.
    - NOTE: The grounding transformer is no longer required and should be removed from the one line diagram.
- The primary side of the interface transformer is connected to a 25 kV class, 600A vacuum interrupter controlled by a SEL 351A multi-function relay.
- The high side of the vacuum breaker is connected to a gang operated three phase, 15 kV class, 600A, lockable, load break switch. The disconnect switch will connect to National Grid's Electric Power System (EPS) through a pole mounted primary metering assembly.

WED 4 (RI-15772951)

- (1) Vensys SDL, 1,500 kW 690V, direct drive permanent magnet, synchronous, converter based, wind turbine generator. The generator output leads to a 690V AC to 620V AC power converter.
- The output of the power converter is connected to the low voltage side of a 1600 kVA 23 kV ungrounded wye primary / 620V/323V grounded-wye secondary (Z=6%, assumed X/R=5) interface transformer.
    - NOTE: The grounding transformer is no longer required and should be removed from the one line diagram.
- The primary side of the interface transformer is connected to a 25 kV class, 600A vacuum interrupter controlled by a SEL 351A multi-function relay.
- The high side of the vacuum breaker is connected to a gang operated three phase, 15 kV class, 600A, lockable, load break switch. The disconnect switch will connect to National Grid's Electric Power System (EPS) through a pole mounted primary metering assembly.

WED 5 (RI-17599370)

- (1) Vensys SDL, 1,500 kW 690V, direct drive permanent magnet, synchronous, converter based, wind turbine generator. The generator output leads to a 690V AC to 620V AC power converter.
- The output of the power converter is connected to the low voltage side of a 1600 kVA 23 kV ungrounded wye primary / 620V/323V grounded-wye secondary (Z=6%, assumed X/R=5) interface transformer.

  - NOTE: The grounding transformer is no longer required and should be removed from the one line diagram.
- The primary side of the interface transformer is connected to a 25 kV class, 600A vacuum interrupter controlled by a SEL 351A multi-function relay.
- The high side of the vacuum breaker is connected to a gang operated three phase, 15 kV class, 600A, lockable, load break switch. The disconnect switch will connect to National Grid's Electric Power System (EPS) through a pole mounted primary metering assembly.

WED 6 (RI-17600293)

- (3) Vensys SDL, 1,500 kW 690V, direct drive permanent magnet, synchronous, converter based, wind turbine generator. The generator output leads to a 690V AC to 620V AC power converter.
- The output of each power converter is connected to the low voltage side of a 1600 kVA 23 kV ungrounded wye primary / 620V/323V grounded-wye secondary (Z=6%, assumed X/R=5) interface transformer.
  - NOTE: The grounding transformer is no longer required and should be removed from the one line diagram.
- The primary side of each of the three, (3), interface transformers is connected in parallel to one, (1),25 kV class, 600A vacuum interrupter controlled by a SEL 351A multi-function relay.
- The high side of the vacuum breaker is connected to a gang operated three phase, 15 kV class, 600A, lockable, load break switch. The disconnect switch will connect to National Grid's Electric Power System (EPS) through a pole mounted primary metering assembly.

2.2 Service Configuration

The proposed locations of the Facilities are normally served by National Grid's 7.2/12.47 kV three-phase, 4 wire, multi grounded wye, effectively-grounded 54F1 and 63F6 circuits.

However, based on the results of the previous impact study, the 12.47kV system was not adequate to interconnection all 10 wind turbines, which is the Customer's primary concern.

Analysis has determined that the best alternative will be to extend, the 2232 circuit, a 23kV sub-transmission circuit, to the facilities.

Based on the Project design at the time the study was performed, the Interconnection Facilities shall consist of a 3-phase,23 kV, overhead primary line extension from Pole # 9003, Flat River Road, Coventry RI onto private property, and to the PCC at each wind turbine location. (See Appendix B). The total distance of the new 2232 circuit extension is approximately 7.5 miles, from the new Tap point to each new PCC (six in total). The majority of the line extension will be overbuild on the existing 54F1 12,47kV circuit, fed from Coventry Substation. There will be new solitary 23 kV, line construction along West Log Bridge road, from the last pole of the Company's existing equipment to the WED 5 PCC. A new recloser and load break switch are required at the tap point of the 2232.

The Point of Common Coupling (PCC) will be designated as the Customer side of the aforementioned connection. National Grid will install bi-directional meters once all required documentation has been received. The Company's Distribution Design department will determine the exact location of the Company's facilities and the customer's dead end pole on private property. The Interconnecting Customer shall be responsible for obtaining all easements required for the line extension in accordance with the Company's requirements. The Customer is required to obtain all required permitting needed for National Grid to install its facilities on private property. The customer is required to grade the area of the proposed facilities, clear trees and vegetation as required, and to provide a suitable means of direct unencumbered access to the company's equipment along a plowed driveway or road.

The Customer shall provide unencumbered direct access to the Company's switch, meters, and recloser along a plowed, accessible driveway or road, where the equipment is not behind the customer's or any third party's locked gate.

All wind turbines are proposed for private property, a minimum 1000' off of the public way, therefore there is no concern for violation of required minimum fall down zones.

2.3 Area EPS

The ability to generate is contingent on the proposed DG Facility being served by the 2232circuit during normal operating conditions. Under abnormal operating conditions, or if it is not supplied by the 2232 circuit, it is not guaranteed that the DG Facility will be allowed to operate. Additionally, if one, (1), of the two, (2), supply stations for the 2232 are out of service, the generator may not be allowed to operate.

2232

This circuit is in a network configuration, with supply out of National Grid's Drumrock and Johnston substations. As it is a 3-phase, 3-wire 23kV sub-transmission circuit it is not effectively grounded and unregulated.

The current characteristics are as follows:

- The daytime loading on the system has varied between a peak of 15 MVA and a minimum of 3.8 MVA.
- Total aggregate generation interconnected/in-process on the feeder, excluding this project, is 0 kW at this time.
- The circuit is un-regulated and has no additional voltage regulators installed outside the substation between the POI and the substation.
- There are two, (2) existing line reclosers on 2232 line, between the proposed generation and the supply stations.
- There are Dispatch controlled capacitor banks at the Coventry, Hope and Drumrock Substations. The area voltage and power factor are actively monitored by Dispatch.

2.4 Revenue Metering Requirements

If not already provided, the Interconnecting Customer shall provide a telecommunication line to National Grid's revenue meters in accordance with ESB756D, Section 5.4.2. The Customer should provide an analog/POTS (Plain Old Telephone Service) phone line to each National Grid owned revenue meter location. The phone line must be capable of direct inward dial without human intervention or interference from other devices such as fax machines, etc. National Grid will specify, test, install, and own the voltage and current transformers necessary to meet the metering requirements for this project. See *Appendix C Figures 7 and 8– (Revenue Meter Phone Line Installation Guide)*

3.0 Steady State Power Flow Analysis

The power flow analysis was substantially performed using CYMDIST. A model of the 2232 circuit was developed based on data extracted from the National Grid GIS and field verified.

Additional load flow analysis was completed using PSS/E. Data was used from current Distribution Planning models and field verified.

The analysis considered cases at minimum and peak load, at time of expected maximum generation, including contingency analysis of the loss of either supply line (from Drumrock or Johnston).

3.1 General Loading Analysis

An analysis of the circuit loading, with and without the wind turbine system operating, was performed and demonstrated that the addition of the DG Facility will not create thermal loading problems on the 2232 circuit, or at either supply Substation. Specifically, no conductor, or transformer overloads occur as a result of this interconnection. All National Grid owned mainline conductor and distribution facilities are thermally large enough to accommodate the added capacity of the 15MW facility, as long as the wind turbines operate as proposed and are limited to 100% to -99% power factor.

Under certain contingency scenarios, where either the Drumrock or Johnston supply side of the 2232 is lost, some overvoltage (OV) conditions may occur but is unlikely. National Grid's dispatch will have the ability to remove the generation from operating if this scenario occurs at their discretion.

3.2 Reverse Power Flow

The possibility of the Facility causing reverse power flow into the Company's EPS was reviewed. At peak export (i.e., 15 MW), it is unlikely that any excess generation from the Facility will flow through the sub-transmission system and into transmission system. All excess power from the DG will be absorbed by the area electric power system (EPS) at various substations.

3.3 Voltage Analysis

The 2232 supply circuit is unregulated but the design of the EPS voltages at customer service points are within defined limits of +/- 5% in ANSI Standard C84.1- 2006.

The Customer is responsible for designing and sizing its own on site distribution system and cabling to the generator to account for any voltage rise/drop on its system due to generation. It was noted that over voltage conditions may occur on the low voltage (690V) side of the customer's transformers during peak and light loads, assuming maximum power output from each generator. These results are based on the cable sizes shown on the customer's one lines. This condition will have no impact on National Grid's EPS, however the customer's equipment and operation may be affected.

The Company will not be held liable for any power quality issues that may affect the EPS or other customers as result of the interconnection of this project's generation.

3.4 Long Term Dynamics Voltage Analysis

The intent of this analysis was to perform a Long Term Dynamic, (LTD) analysis for the Wind Energy Development (WED) wind turbines to observe how the potential power fluctuations may impact the power quality, voltage drop/rise, voltage regulation, thermal capabilities, flicker conditions and operational effect of the area EPS. The analysis observed whether potential power fluctuations and voltage changes at the POIs and the nearby mainline

were maintained within the required ANSI "A" range (+/- 5% of nominal), by the voltage regulation equipment on the circuit.

The CYME, Long Term Dynamic module was used for the assessment of the impact the proposed wind turbines would have on the area EPS. The analysis was run for a 24 hour period at a 10 second iteration rate. The customer provided, 24 hour, 6 second sample rate, power output data for the existing North Kingston, RI, wind turbine, collected on March 26, 2014 was utilized for the analysis because it appears to represent volatile wind turbine output for a windy gusty day. This data was further edited based on an agreed upon set of assumptions and resubmitted on 1/19/2015.

- During turbulent events, the WTs are capped at 1,400kW each (16.3 RPM).
- After a turbine trips, each is locked at 20kW/s ramp up rates to further prevent voltage excursions on the line. This data includes a tripping event for the turbines.
- Certain abnormal tripping events were removed from the original data (due to maintenance on the day the data was captured).
- Reactive power contributions based on a certain power Factor limit
    - P=0-50%, power Factor = 100%
    - P=50-100%, power Factor = adjustable, -95% was first submitted, -99% data was also created.
- Each generator has a staggered set of data, starting with WED 1. WED 2 has the same curve shifted by 30s and the same goes for each, from WED 1 to WED 6B.

This analysis concluded that, without any major modifications to the EPS, all wind turbines can be connected to the 2232 without creating voltage issues.

Additionally, voltage flicker should not be an issue on the 2232 system, or the various distribution feeders from nearby substations supplied by the 2232, namely Hope, Arctic and Coventry. These were also modeled, with their specific voltage regulators in service.

4.0 Short Circuit and Protection Analysis Company Facilities

4.1 Temporary Over-Voltages on Transmission Supply

Based upon the winding configuration of the supply transformers at Drumrock and Johnston substations, zero sequence overvoltage protection (3V0) will not be required at those substations for this Project. Temporary over voltages during faults on the transmission system should not develop on account of this project.

4.2 Fault Current Contributions

Table 2 summarizes the generation effect on fault current levels at the PCC. These fault currents are within existing equipment ratings and will not upset existing device coordination on the feeder. The customer is responsible for ensuring that their own equipment is rated to withstand the available fault current according to the NEC and National Grid ESB 750, which specifies that the fault current should be no more than 80% of the device interrupting rating.

Fault Duty Pre and Post Project

Pre-Project:			Post- Project:				
Fault Location	Fault Type	Amps/Pre	Amps/ Post	*Δ%	System Impedance @ PCC Post Project		
23kV Drumrock Substation Bus	Line to Grd	22520	22598	0.35%			
	Three Phase	41488	41703	0.52%			
23kV Hope Substation Bus	Line to Grd	2572	2622	1.94%			
	Three Phase	6199	6421	3.58%			
23kV PCC WED 1	Line to Grd	N/A	1010	N/A	Z-positive - Units = Ω	Z-negative - Units = Ω	Z-zero - Units = Ω
	Three Phase	N/A	2208	N/A	3.48+j5.52	2.64+j6.83	7.17+j28.36
23kV PCC WED 2, 2A, 2B	Line to Grd	N/A	984	N/A	Z-positive - Units = Ω	Z-negative - Units = Ω	Z-zero - Units = Ω
	Three Phase	N/A	2134	N/A	3.67+j5.67	2.81+j7.04	7.51+j29.02
23kV PCC WED 3	Line to Grd	N/A	972	N/A	Z-positive - Units = Ω	Z-negative - Units = Ω	Z-zero - Units = Ω
	Three Phase	N/A	2009	N/A	4.2+j5.76	3.52+j6.97	8.1+j28.56
23kV PCC WED 4	Line to Grd	N/A	972	N/A	Z-positive - Units = Ω	Z-negative - Units = Ω	Z-zero - Units = Ω
	Three Phase	N/A	2007	N/A	4.2+j5.76	3.52+j6.97	8.1+j28.56
23kV PCC WED 5	Line to Grd	N/A	930	N/A	Z-positive - Units = Ω	Z-negative - Units = Ω	Z-zero - Units = Ω
	Three Phase	N/A	1958	N/A	4.18+j6.06	3.32+j7.46	8.34+j30.25
23kV PCC WED 6, 6A, 6B	Line to Grd	N/A	998	N/A	Z-positive - Units = Ω	Z-negative - Units = Ω	Z-zero - Units = Ω
	Three Phase	N/A	2179	N/A	3.53+j5.59	2.67+j6.93	7.29+j28.69

*Δ% = (Post-Pre)/Pre

The 23 kV system impedance shown at the PCC is in ohms. The value is taken from the model developed using ASPEN Oneliner. The model was based on the proposed installation as described in Section 2.1. If a different

configuration, and/or transformer winding configuration, or impedances are used, the Short Circuit and Protection Analysis will need to be re-evaluated at additional expense to the IC.

The protection analysis did indicate that a line to ground fault, in the vicinity of any of the PCCs, will result in overvoltage on the unfaulted phases in excess 1.40 PU of the nominal Line to ground voltage.

5.0 Protection Analysis Customer Facilities

The protection review consisted of a review of customer's transformer connection and protection scheme and assessment of protection and transfer trip requirements. This Facility shall comply with the relevant provisions of R.I.P.U.C. NO. 2078 Dec 2009 and requirements of ESB-756D, as applicable. Please note that applicable sections of ESB-756D are referenced for information purposes and may not comprise the entirety of applicable sections. The key requirements for this Project include, but are not limited to:

5.1 Disconnect Switch

Per ESB 756D, Section 5.6 & R.I.P.U.C. NO. 2078: The Facility shall provide a disconnect switch (or comparable device mutually agreed upon by the Parties) at the point of Facility interconnection that can be opened for isolation. The switch shall be in a location easily accessible to Company personnel at all times. The switch shall be gang operated, have a visible break when open, be rated to interrupt the maximum generator output and be capable of being locked open, tagged, and grounded on the Company side by Company personnel. The Company shall exercise such right in accordance with Section 7.0 of the interconnection tariff.

The Customer's one-line meets this requirement. The customer shall provide the Company with 24/7 unlimited access, for access and control of this switch. The Customer shall provide direct access to the switch along an accessible driveway or road, such that it is not behind the customer's locked gate. If the disconnect switch is required behind the customer's locked gate, double locking, where both the Company's and Customer's locks shall be employed, will be required.

5.2 Unintentional islanding

Inverters/Converters shall be in compliance with ESB 756D5.7.10.1 and R.I.P.U.C. NO. 2078section 4.2.1 General requirements, where all inverters/Converters must be IEEE 1547 compliant and UL-1741 certified inverters shall be equipped with an internal anti islanding scheme and active under voltage (27), over voltage (59), zero sequence over voltage (59N), under frequency (81U) and over frequency (81O) relays.

The Vensys converters are not UL 1741-2005/ IEEE1547listed and do not have any active islanding detection functionality.

However, due to the nature of the 2232 circuit, it is extremely unlikely that the wind turbine system will be islanded with load (as there are two supply substations). Dispatch has the discretion to take the generation system offline and lock out of service is one of two supply's must come offline for maintenance, in order to prevent accidental islanding of the 23kV EPS during an N-1 contingency.

5.3 Direct Transfer Tripping

Refer to section 4.2 above, a direct transfer tripping system, is not required for this interconnection.

5.4 Interconnection Interrupting Device

In accordance with ESB 756D, Sections 5.7.2 and 5.7.10.1 for a primary Wye- secondary Wye interface transformer, the interrupting device shall be installed on either side of the transformer.

The Customer's one-line shows an unknown make/model 600A 25kV main breaker controlled by a SEL-351A multifunction relay. The one line has the required interrupter but lacks the make and model number of the device. A new RI PE stamped one-line must be provided that has the required information must be clearly stated on it.

5.5 Transformers

The Company reserves the right to specify the winding connections for the transformer between the Company's voltage and the Facility's voltage (Interface Transformer) as well as whether it is to be grounded or ungrounded at the Company's voltage. **Refer to ESB-756D section 5.7.**

Additionally, the interface transformers must have two, (2), - 2.5% primary taps above and below the nominal kV rating.

The interconnecting circuit is 23 kV, 3wire, Not Effectively Grounded.

Each wind turbine connects, to a 1,500 kVA,23kV, ungrounded wye primary –620 V Grd-Y/ 358 V secondary interface transformer, which is acceptable.

It is recommended that should the IC utilize a Wye primary it have a fully rated winding and fully insulated and isolated neutral bushing to be able to withstand temporary overvoltage conditions that could develop for certain fault conditions that can occur on the Company EPS.

High side delta, low side Yg transformers are also acceptable.

5.6 Voltage relays

Voltage relays shall be frequency compensated to provide a uniform response in the range of 40 to 70 Hz. Refer to ESB 756D section 5.7.6.

The one line meets this requirement. The one lines show Yg-Yg VTs, 60:1 ratio on the 23kV side of the transformers.

Additionally, 59N protection is required on the high side of each transformer, using Yg-Yg VTs and must trip the high side interrupting device.

The customer's one line meets these requirements.

5.7 Overcurrent Relays

Per section 5.7.8 of the ESB 756D Overcurrent protection is required on the high side of the DG Customer's interface transformer to detect faults on the Company's EPS. Separate Voltage Controlled Overcurrent elements (51C Phase) and (51C Ground) are required. At a minimum, these relays shall utilize voltage sensing via 3 phase wye-grounded / wye-grounded VTs and 3 phase current sensing CTs. The 51C elements shall trip the interrupting device.

The one line meets this requirement; each interconnection utilizes an SEL-351A multifunction relay and 51C phase and ground enabled. Final settings

will be determined during the Witness Testing portion of the interconnection once all equipment is finalized.

5.8 Protective Relay Hard-Wire Requirement

Unless authorized otherwise by the Company, protective relays must be hardwired to the device they are tripping. Further, interposing computer or programmable logic controller or the like is not permitted in the trip chain between the relay and the device being tripped.

The customer's one-line meets these requirements.

5.9 Protective Relaying Redundancy

Refer to ESB 756D Inverter-based PV Generator Equal or Above 500k. The relays at the converter terminal shall provide the redundant protection for voltage and frequency elements. However, the relay equipped for overcurrent protection has no redundancy, National Grid requires that the relay alarm contact should be wired to trip the switchgear when the relay fails, not in service or the DC supply voltage to the relay is lost. There will be 2s time delay in tripping the switchgear. A timer needs to be added to the switchgear's trip circuit or the internal relays must be programmed to include the delay.

An updated PE stamped one-line must be submitted satisfying this requirement.

5.10 Protective Relay Supply

Refer to ESB 756D section 5.7.10.4. Where protective relays are required in this Section, their control circuits shall be DC powered from a battery and battery charger system. Solid state relays shall be self-powered, or DC powered from a battery and battery charger system. If the Facility uses a Company-acceptable non-latching interconnection contactor, AC powered relaying may be allowed provided the relay and its method of application are fail safe, meaning that if the relay fails or if the voltage and/or frequency of its AC power source deviate from the relay's design requirements for power, the relay or a separate fail-safe power monitoring relay acceptable to the Company will trip the generator, after a 2 second time delay, by opening the coil circuit of the interconnection contactor.

A new PE stamped one-line must be provided that shows the battery and charger system powered by an auxiliary transformer with the proper primary voltage.

5.11 Current Transformers ("CT")

Refer to ESB 756D section 5.7.4.1. CT ratios and accuracy classes shall be chosen such that secondary current is less than 5 amperes and transformation errors are consistent with Company practices.

The one-line shows 300:5 ampere CTs, located at the 25kV interrupting device and meets this requirement.

5.12 Voltage Sensing and Voltage Transformers ("VT")s and Connections

Transformer options based on the selected transformer configuration to detect the Under Voltage, line to ground faults, and provide voltage detection for a voltage controlled over current (51C) element. Refer to ESB 756D sections 5.7.4.2 and 5.7.8.

The customer's one line meets this requirement.

5.13 High-Speed Protection

The Facility may be required to use high-speed protection if time-delayed protection would result in degradation in the existing sensitivity or speed of the protection systems on the Company's EPS.

High speed protection is not required.

5.14 Service Entrance Equipment

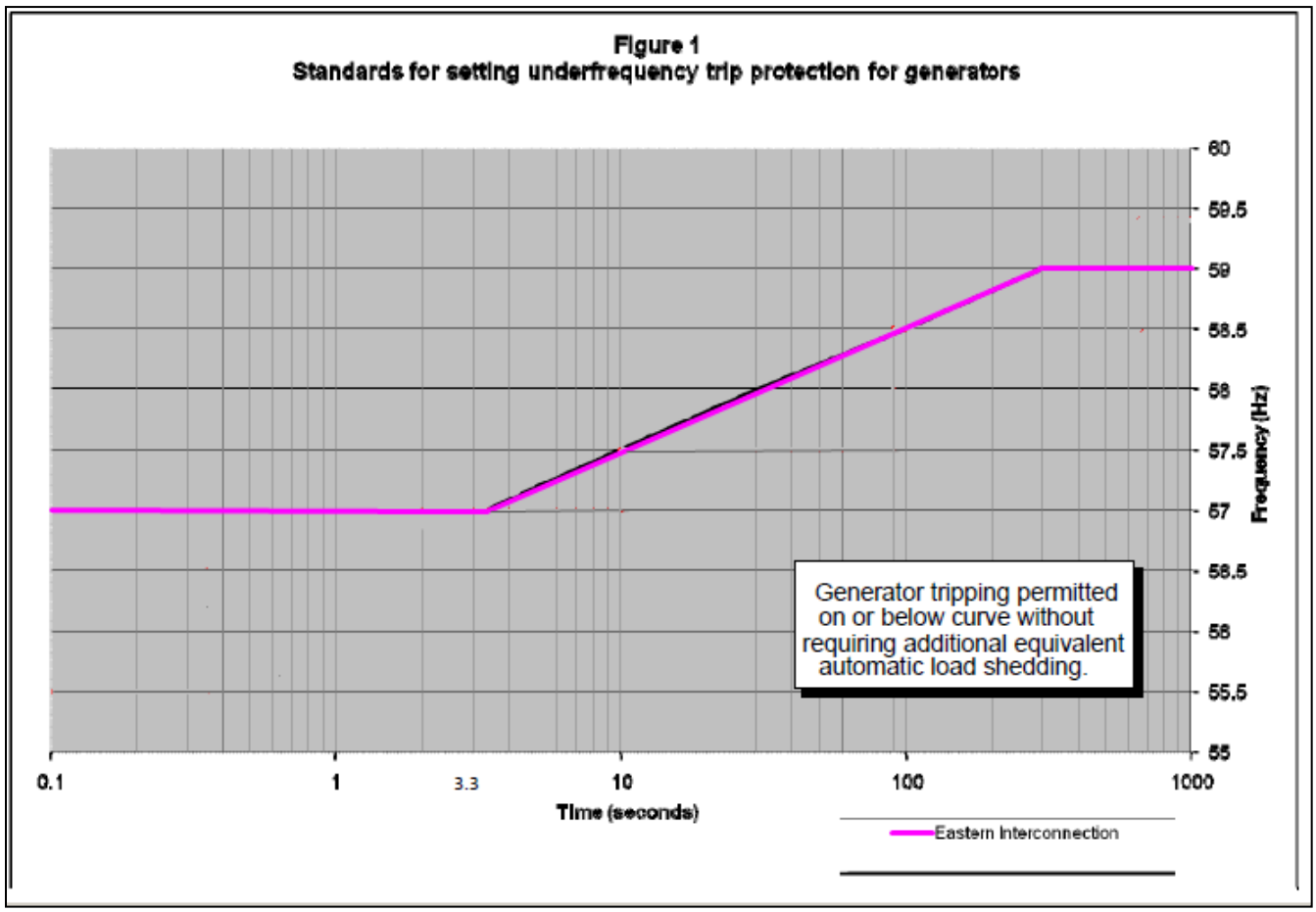
The Interconnection Customer shall furnish, install, own, and maintain service entrance equipment in accordance with applicable requirements set forth in ESB 750, Section 5, and ESB756D, Section 5.4.1.3 and Exhibit 7.

5.15 Surge-Withstand capability

The interconnection system shall have the capability to withstand voltage and current surges in accordance with the environments defined in IEEE Standard C62.41.2-2002 or IEEE Standard C37.90.1-2002 as applicable.

5.16 Additional Requirement

R.I.P.U.C. No. 2078 requires that the Distributed Resources (DR) cease to energize the area EPS within 2 seconds, refer to IEEE1547 and UL1741. The Interconnection system's response to abnormal frequencies, Section 4.2.3.2.1 requires that NPCC Directory 12 Figure 1 Curve "Standards for Setting Underfrequency Trip Protection for Generators" for the Eastern Interconnection be followed. It is important that clearing time should be the time that the relay trips plus breaker operating time.



The under frequency setting points should also comply with the NPCC standard for setting under frequency trip protection. Per the NPCC Directory 12 Figure 1Curve, if the setting falls

above the curve, there must be an equivalent amount of load shed when tripped, which in this case cannot be done. Therefore the 81 under frequency must be set on or below the NPCC Directory 12 Figure 1 Curve for the Eastern Interconnection.

The converters' internal relays shall also meet the NPCC Directory 12 Figure 1 Curve requirements for the Eastern Interconnection.

Also the converters internal relays should match those set in the SEL-351A relay for voltage and frequency. The settings shown on the one line do not.

5.17 Protection Scheme Assessment

The customer must submit a PE stamped one line which includes the required redundant relay settings, inverter internal relay settings, and meets all the requirements specified within this document, to the Company for review and approval before an interconnection application can move forward.

6.0 Telemetry and Telecommunications

Refer to ESB 756D section 6.4. The Company requires real time monitoring and reporting of generation data for this project per the recommendations of IEEE 1547.3 IEEE Guide for Monitoring, Information Exchange, and Control of Distributed Resources Interconnected with Electric Power Systems.

Each of the facilities in this Project is an IPP and therefore National Grid does not require a RTU.

The Interconnecting Customer (IC) is advised to communicate with ISO-New England for any telemetry requirement as ISO-NE may require real-time monitoring between ISO-NE EMS and the DG site. The IC shall refer to the ISO-NE website and ISO-NE customer service help desk for details.

7.0 Inspection, Compliance Verification, Customer Testing, and Energization Requirements

7.1 Inspections and Compliance Verification

For this study, the DG Facility is deemed as an Independent Power Producer pursuant to applicable RI state jurisdictional requirements. A municipal electrical

inspection approval certificate from the local authority having jurisdiction is required of the DG Customer's facilities (i.e. primary service entrance conduit, primary switchgear, wiring, and generation equipment). The Company must receive the DG Customer's final set of installation drawings, equipment data, and test plan for the functional verification tests at least four (4) weeks before the Company's field audit.

The DG Customer shall adhere to all other Company related verification and compliance requirements as set forth in the applicable ESB 750 series documents. These and documented acceptance testing requirements of these facilities will be specified during the final design review of the Project prior to the Company's field audit and energization.

7.2 Testing and Commissioning

The Interconnection Customer shall submit initial relay settings to the Company no later than twenty-one (21) calendar days following the Company's acceptance of the Facility's service connection's final MA state licensed professional engineer sealed design. If changes/updates are necessary, the Company will notify the Interconnection Customer three (3) business days after the initial relay settings were received, and the Interconnection Customer shall submit the revised settings within seven (7) calendar days from such notification. Within three (3) business days of receipt of the proposed final relay settings, the Company shall provide comments on and/or acceptance of the settings. If the process must continue beyond the above evolution due to errors in the relay settings, the Company retains the right to extend the Testing and Commissioning process, as needed, to ensure the final relay settings are correct.

Assuming no major issues occurring with the relay settings, the Interconnection Customer shall submit a Testing and Commissioning Plan (TCP) to the Company for review and acceptance, no later than forty-five (45) calendar days following the Company's acceptance of the Facilities final design. The TCP must be finalized, including Company acceptance, no later than six (6) weeks prior to functional testing.

7.3 Energization and Synchronization

The "Generator Disconnect Switch" at the interconnection point shall remain "open" until successful completion of the Company's field audit and witness testing. Prior to the start of construction, the DG Customer shall designate an Energization Coordinator (EC), and prepare and submit an Energization Plan (EP) to the Company for review and comment. The energization schedule shall be submitted to the Company and communicated with the Company's local Regional Control Center at least two (2) weeks in advance of proposed energization. Further details of the EP and synchronization requirements will be specified during the final design review of the Project.

The DG Customer shall submit as-built design drawings to the Company 90 days following commercial operation of their DG Facility.

8.0 Cost Estimates

The non-binding good faith cost planning grade estimate for the Company's work associated with the interconnection of this Facility to the EPS, as identified in this report, is **$5,366,600.00**+/-25%, and includes:

National Grid Work Item	Conceptual Cost +/-25% Planning Grade Cost Estimate not including Tax Liability				Associated Tax Liability $ @ Applied to capital	Total Customer Costs includes Tax Liability on Capital Portion
System Modifications	**Pre-Tax Total $**	**Capital**	**O&M**	**Removal**	**22.84%**	**Total $**
Build 3 Phase line extension from Pole 9003 Flat River Road, 7.5 Miles to the six wind turbine generator sites	$4,075,000.00	$3,129,000.00	$509,000.00	$437,000.00	$715,000.00	$4,790,000.00
Six new primary metered services, each with new poles, conductor, load break switch, recloser and primary meter	$452,000.00	$452,000.00	$0.00	$0.00	$104,000.00	$556,000.00
EMS Integration	$5,600.00	$0.00	$5,600.00	$0.00	$0.00	$5,600.00
SUBTOTAL	**$4,532,600.00**	**$3,581,000.00**	**$514,600.00**	**$437,000.00**	**$819,000.00**	**$5,351,600.00**
Interconnecting Customer Interconnection Facilities ("ICIF")	**Pre-Tax Total $**	**Capital**	**O&M**	**Removal**	**22.84%**	**Total $**
Witness Testing	$15,000.00	$0.00	$15,000.00	$0.00	$0.00	$15,000.00
SUBTOTAL	**$15,000.00**	**$0.00**	**$15,000.00**	**$0.00**	**$0.00**	**$15,000.00**
	Pre-Tax Total $	**Capital**	**O&M**	**Removal**	**29.55%**	**Total $**
Totals	**$4,547,600.00**	**$3,581,000.00**	**$529,600.00**	**$437,000.00**	**$819,000.00**	**$5,366,600.00**

Note: Authorization for parallel operation will not be issued without a fully executed Interconnection Service Agreement, receipt of the necessary insurance documentation, and successful completion of the Company approved witness testing. Such authorization shall be provided in writing.

This **$5,366,600.00 +/- 25% total** planning grade estimate is based on information provided by the Interconnecting Customer for the study, and is prepared using historical cost data from similar projects. The associated tax effect liability included is the result of an IRS rule, which states that all costs for construction collected by National Grid, as well as the value of donated property, are considered taxable income.

This estimate is valid for ninety (90) calendar days from the issuance of this report. If the Interconnection Customer elects to proceed with this project after the ninety (90) calendar days, a revised estimate may be required.

A 2014 tax rate of 22.84% is expected to apply to contributions in aid of construction ("CIAC") payments received by Narragansett Electric Company from the Interconnecting Customer for construction completed in 2014. The calculation of the tax gross-up adder is included in this cost estimate on the basis of tax guidance published by the Internal Revenue Service, but tax rates and decisions are ultimately subject to IRS discretion. By signing this agreement, the Interconnecting Customer understands and agrees that the tax has been estimated for convenience and that the Interconnecting Customer remains liable for all tax due on CIAC payments, payable upon the Company's demand.

9.0 Conclusion

The project was found to be feasible. It will be allowed to interconnect with certain modifications and additions to the local National Grid distribution Electric Power System (EPS) the Interconnecting Customer's equipment. The estimated planning grade cost for the Company's work associated with the Project is **$5,366,600.00** +/- 25%.

The present interconnection configuration and protection scheme submitted for review must be modified to meet National Grid's specific protection requirements. The customer must submit a PE stamped electrical one-line along with the required relay settings, that meets all the requirements specified within this document, to National Grid for review and approval, before an interconnection application can move forward.

A milestone schedule shall be included in the Interconnection Agreement and shall be reflective of the tasks identified in ESB756D, Exhibit 2. Upon execution of the Interconnection Agreement, and prior to advancing the project, the Interconnecting Customer shall provide a detailed project schedule, inclusive of the Exhibit 2 tasks referenced above. After completion of final design and all associated applications, fees, permitting and easement requirements are satisfied, System Modifications for this Project will be placed in queue for construction.

If an Interconnecting Customer fails to meet the R.I.P.U.C. No 2078, Section 3.4 Time Frames and does not provide the necessary information required by the Company within the longer of 15 days or half the time allotted to the Company to perform a given

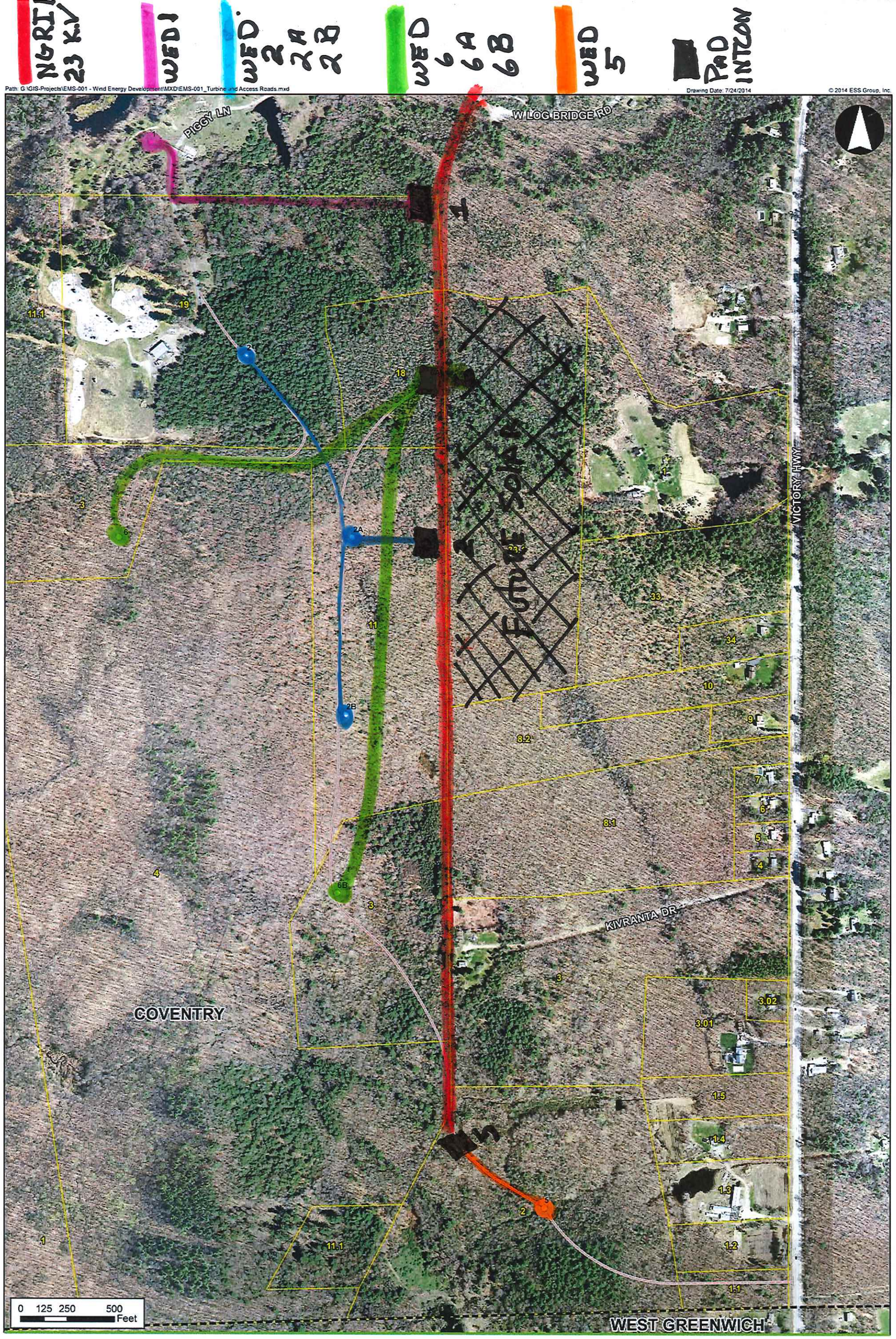
step, or as extended by mutual agreement, then the Company may terminate the application and the Interconnecting Customer must re-apply.

Note: Authorization for parallel operation will not be issued without a fully executed Interconnection Agreement, receipt of the necessary insurance documentation, and successful completion of the Company approved witness testing. Such authorization shall be provided in writing.

10.0 Revision History

Version	Date	Description of Revision
1.0	2/18/14	Final: WED Coventry 1, 2, 3, 4, 5&6, LLC, 23kV

Appendix A IC Site and One-line Diagrams



Coventry - Wind Energy Development
Coventry, Rhode Island

1 inch = 450 feet

Source: 1) Parcel Data, Town of Coventry GIS 2) RIDOT, Roads, 2010
3) FWS, NWI Wetlands, 2010 4) USGS, 6in Aerial Imagery, 2011
5) RIGIS, Town Boundaries, 1989

ess group
environmental consulting & engineering services

Legend

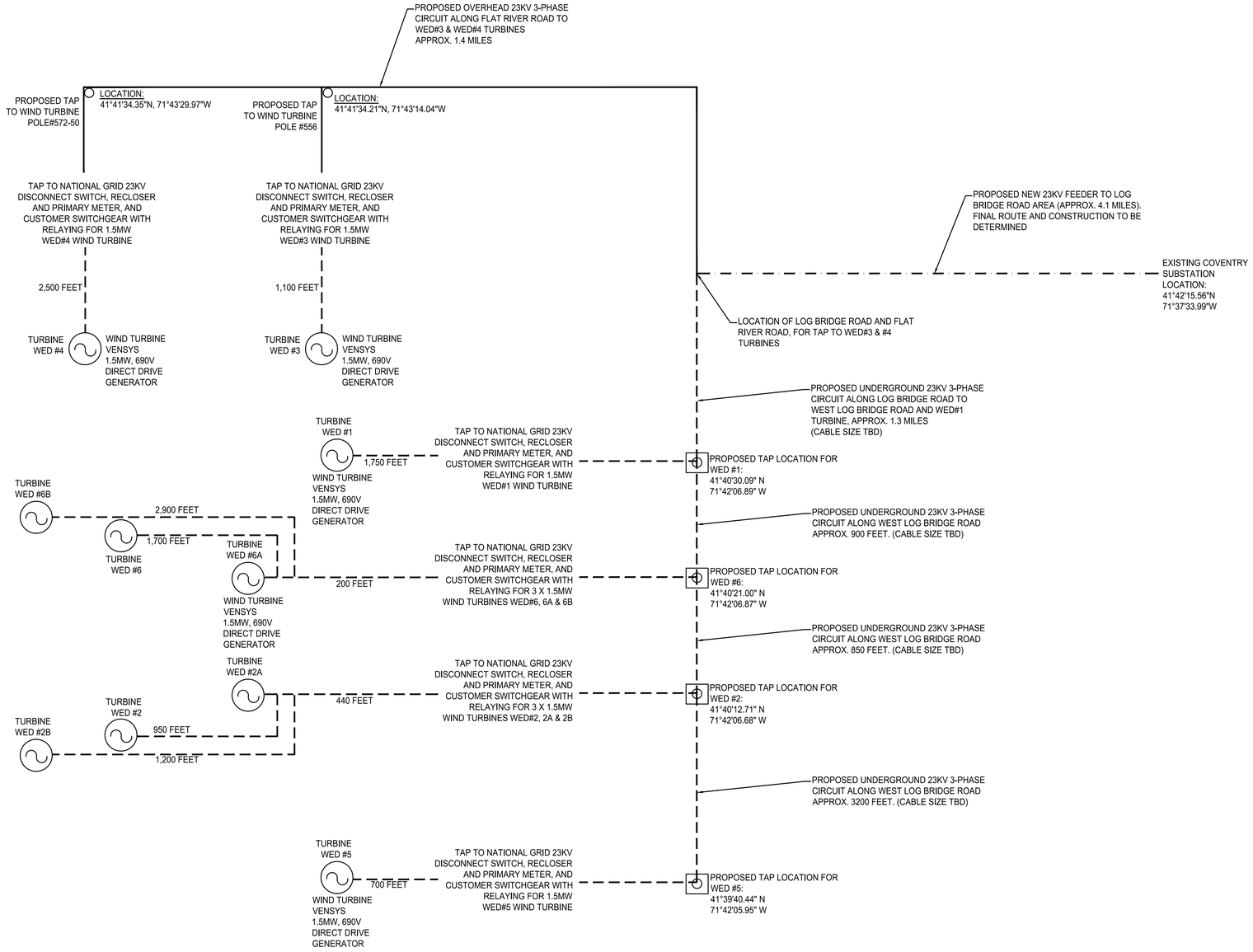
- Turbine Location Point
- Access Road Centerline
- Access Road
- Parcel Boundary

Coventry Turbine Location Map

PRIMARY
SECONDARY
OVERHEAD
UNDERGROUND

ONE LINE POWER DIAGRAM

- LOAD-BREAK SWITCH FUSE, SIZE AS INDICATED
- TRANSFORMER, SIZE AS INDICATED (DELTA-WYE GND TYPICAL)
- CIRCUIT BREAKER
- DRAW-OUT CIRCUIT BREAKER
- K1 KIRK-KEY INTERLOCK
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- SOLID STATE TRIP UNIT
- GROUND
- Ⓐ AMMETER
- As AMMETER SWITCH
- Ⓥ VOLTMETER
- Vs VOLTMETER SWITCH
- T2 DRY TYPE TRANSFORMER. "2" INDICATES SIZE, REFER TO DRY TYPE TRANSFORMER SCHEDULE
- L.A. LIGHTNING ARRESTER
- CABLE TERMINATION / LOAD-BREAK ELBOW
- FUSED CUT-OUT
- GROUP-OPERATED AIR-BREAK (GOAB) SWITCH
- Ⓜ REVENUE METER (BY UTILITY)
- 200A 200A LOAD BREAK ELBOWS



DAVID J. COLOMBO
No. 8527
REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL
01-29-2015

No.	DATE	DESCRIPTION
0	01/19/2015	ISSUED FOR REVIEW

REVISIONS

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CHIEF DESIGNER:
REVIEWED BY: DATE

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SCALE:
HORZ.:NONE
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DATUM:
HORZ.:
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37 Fox Den Road
Kingston, MA 02364-2150
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www.PowerEngineersLLC.com
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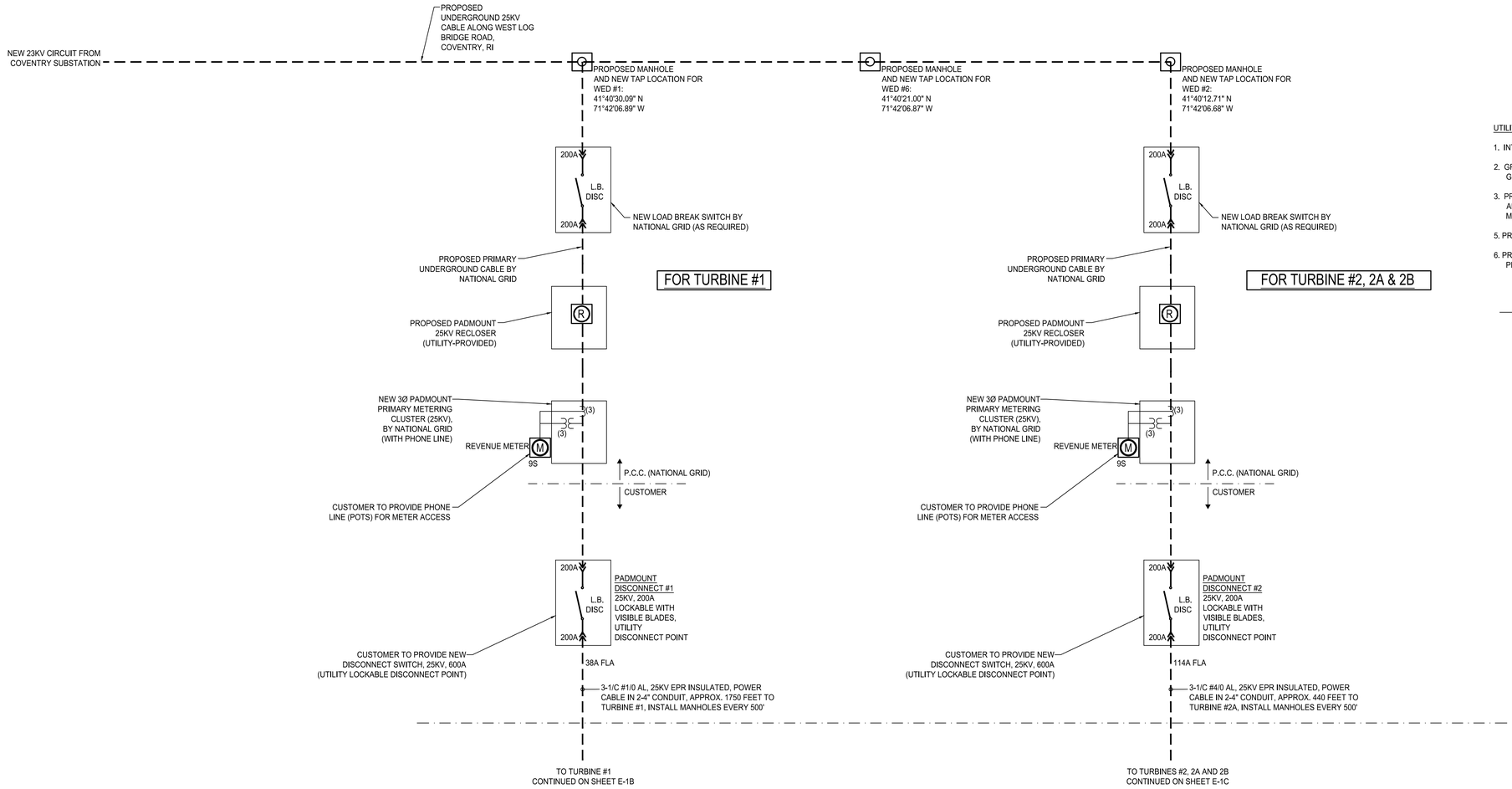
WIND ENERGY DEVELOPMENT, LLC
COVENTRY WIND TURBINES
PROPOSED OVERALL 23KV ONE-LINE DIAGRAM
COVENTRY RHODE ISLAND

PROJ. No.: 144D
DATE: JAN 2015
E-0
SIZE: D | REV: 0



UTILITY INTERCONNECTION NOTES:

1. INTERFACE TRANSFORMER TO BE WYE PRIMARY AND SECONDARY.
2. GROUNDING TRANSFORMER TO HAVE INSULATED H0 BUSHING WITH EXTERNAL GROUND STRAP, TO ALLOW PLACEMENT OF NEUTRAL CT ON TRANSFORMER PRIMARY.
3. PROVIDE POTS PHONE LINE TO THE NGRID PRIMARY METERING. PROVIDE 3 FEET ADDITIONAL PHONE LINE AND LIQUID-TIGHT CONDUIT WITH END NUT TO BOTTOM OF METER SOCKET.
5. PROTECTIVE RELAYS TO HAVE BATTERY BACKUP OR UPS FOR BACKUP.
6. PROTECTIVE RELAY ALARM CIRCUIT TO BE WIRED TO TRIP SWITCH FOR REDUNDANCY PER NATIONAL GRID REQUIREMENTS.

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32R	REVERSE POWER RELAY
46	NEGATIVE PHASE SEQUENCE OVERCURRENT RELAY
47	REVERSE PHASE VOLTAGE RELAY
50/51	INSTANTANEOUS / TIME OVERCURRENT RELAY
51N	GROUND OVERCURRENT RELAY
59I	INSTANTANEOUS OVERVOLTAGE RELAY
59T	TIME OVERVOLTAGE RELAY
60	VOLTAGE BALANCE RELAY
81/O	OVER FREQUENCY RELAY
81/U	UNDER FREQUENCY RELAY

PRIMARY
SECONDARY
OVERHEAD
UNDERGROUND

ONE LINE POWER DIAGRAM

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- POTENTIAL TRANSFORMER
- SOLID STATE TRIP UNIT
- GROUND
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- As — AMMETER SWITCH
- V — VOLTMETER
- Vs — VOLTMETER SWITCH
- T2 — DRY TYPE TRANSFORMER. "2" INDICATES SIZE, REFER TO DRY TYPE TRANSFORMER SCHEDULE
- L.A. — LIGHTNING ARRESTER
- CABLE TERMINATION / LOAD-BREAK ELBOW
- FUSED CUT-OUT
- GROUP-OPERATED AIR-BREAK (GOAB) SWITCH
- M — REVENUE METER (BY UTILITY)
- 200A — 200A LOAD BREAK ELBOWS

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REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL
01-29-2015

TURBINE #1 IS CONNECTED TO A SINGLE NET METER
TURBINES #2, #2A & #2B CONNECTED TO A SINGLE NET METER

No.	DATE	DESCRIPTION
6	1/29/2015	REVISED FOR 23KV INTERCONNECTION
5	10/29/2014	REVISED FOR PERRY HILL INTERCONNECTION POINT
4	9/17/2014	REVISED FOR GROUNDING TRANSFORMER
3	7/14/2014	REVISED FOR VENSYS TURBINE
2	7/7/2014	REVISED TURBINE CONFIGURATION
1	01/03/2013	REVISED FOR NGRID APPLICATION
0	01/20/2012	ISSUED FOR REVIEW

REVISIONS

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CHIEF DESIGNER:
REVIEWED BY: DATE

SEAL

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HORZ.:NONE
VERT.:
DATUM:
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37 Fox Den Road
Kingston, MA 02364-2150
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WIND ENERGY DEVELOPMENT, LLC

COVENTRY - PIGGY LANE WIND TURBINES

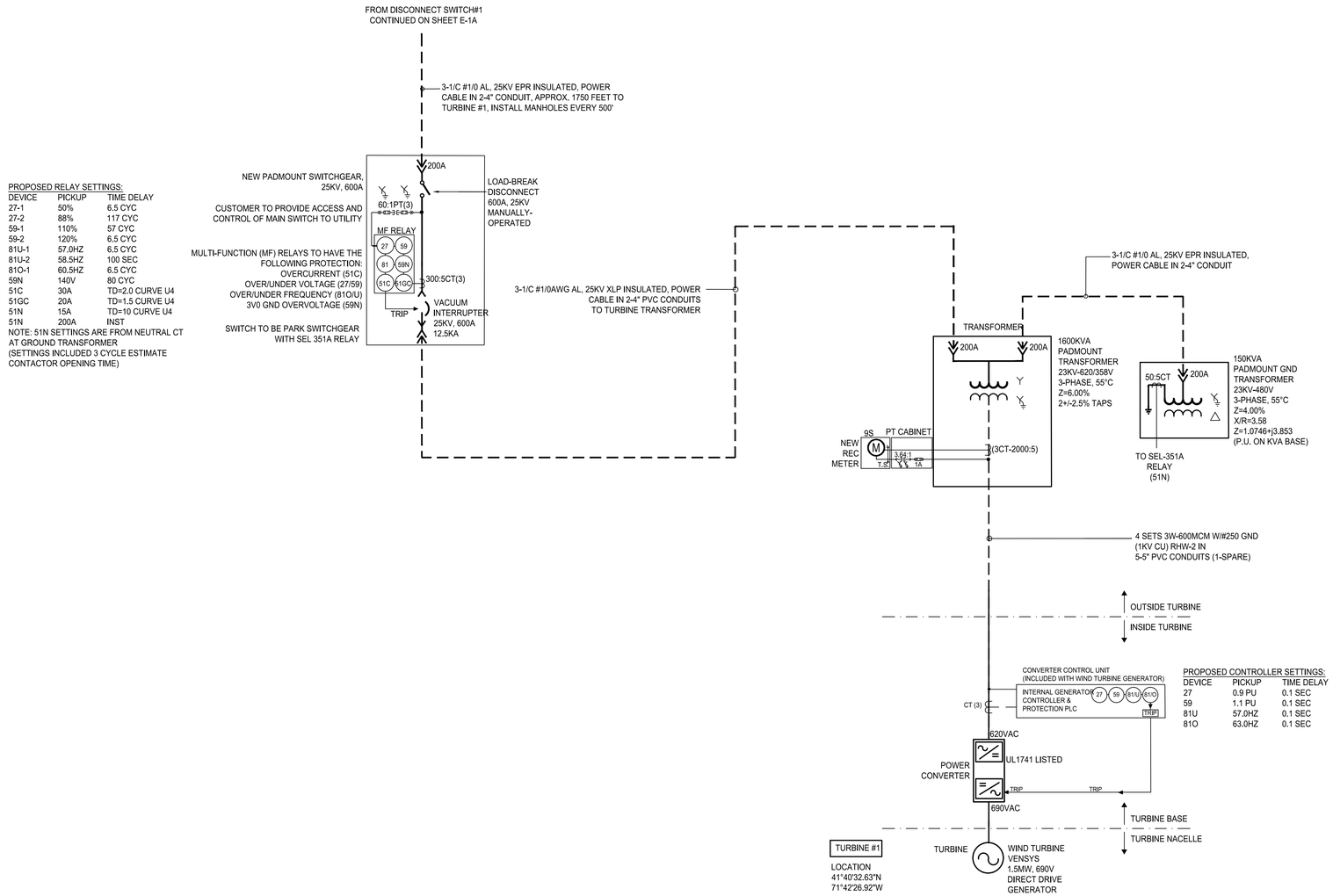
PROPOSED ONE-LINE DIAGRAM

OFF OF PERRY HILL ROAD, COVENTRY RHODE ISLAND

PROJ. No.: 144D
DATE: JAN 2012

E-1A

SIZE: D REV: 6



CONTRACTOR SHALL PROVIDE ALL EQUIPMENT SHOWN ON ONE-LINE DIAGRAM, UNLESS NOTED TO BE PROVIDED BY UTILITY.

PRIMARY
SECONDARY
OVERHEAD
UNDERGROUND

DEVICE NO.	DESCRIPTION
27T	TIME UNDER VOLTAGE RELAY
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59T	TIME OVERVOLTAGE RELAY
60	VOLTAGE BALANCE RELAY
81/O	OVER FREQUENCY RELAY
81/U	UNDER FREQUENCY RELAY
59N	ZERO-SEQ. GROUND OVER-VOLTAGE RELAY (3V0)

ONE LINE POWER DIAGRAM

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- DRAW-OUT CIRCUIT BREAKER
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- POTENTIAL TRANSFORMER
- SOLID STATE TRIP UNIT
- GROUND
- A AMMETER
- AS AMMETER SWITCH
- V VOLTMETER
- VS VOLTMETER SWITCH
- T2 DRY TYPE TRANSFORMER. "2" INDICATES SIZE, REFER TO DRY TYPE TRANSFORMER SCHEDULE
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- FUSED CUT-OUT
- GROUP-OPERATED AIR-BREAK (GOAB) SWITCH
- M REVENUE METER (BY UTILITY)
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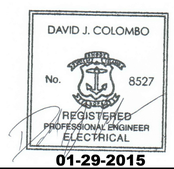

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PROPOSED ONE-LINE DIAGRAM
OFF OF PERRY HILL ROAD, COVENTRY RHODE ISLAND

PROJ. No.: 144D
DATE: JAN 2012
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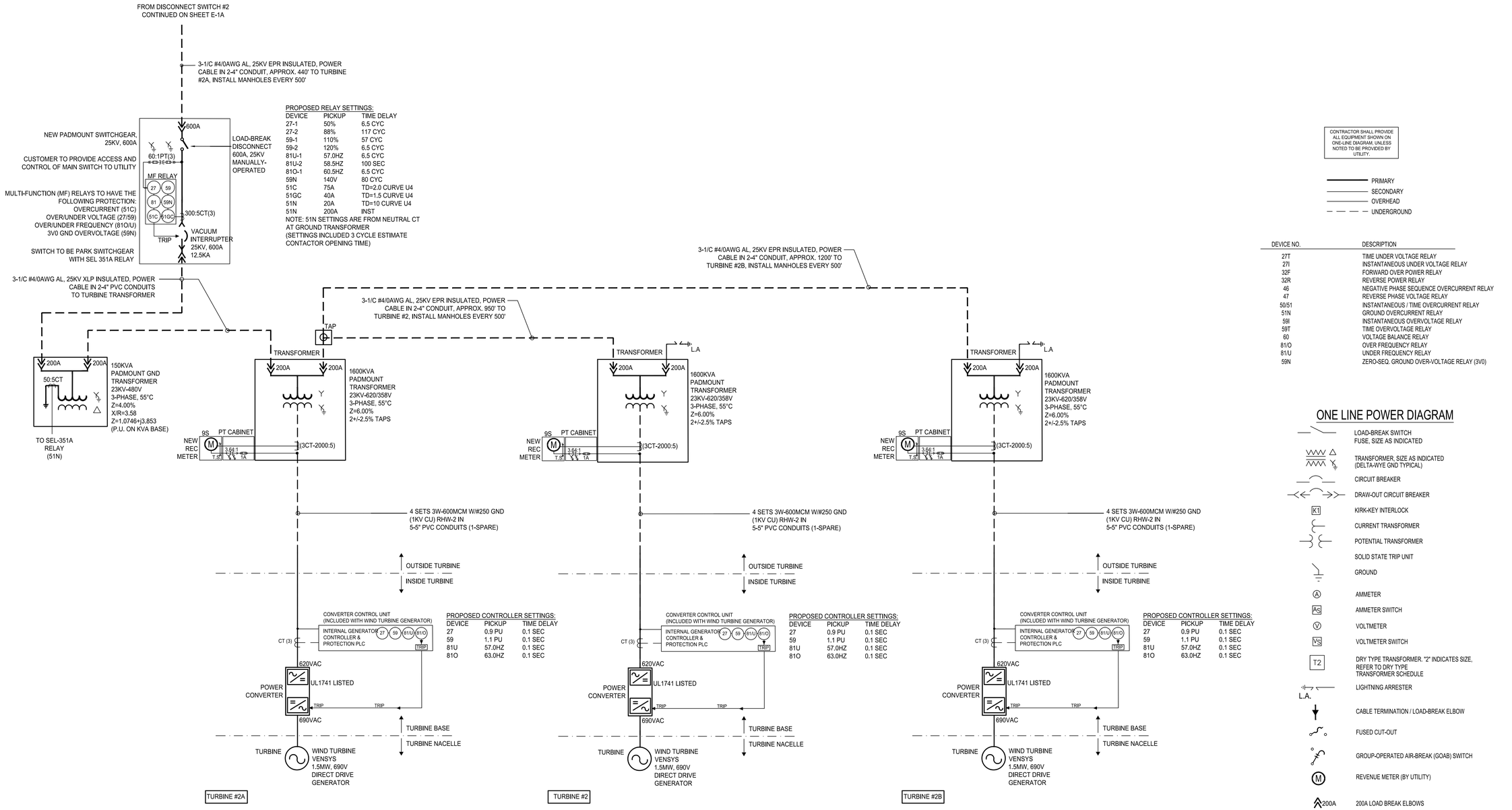

DAVID J. COLOMBO
No. 8527
REGISTERED PROFESSIONAL ENGINEER ELECTRICAL

01-29-2015

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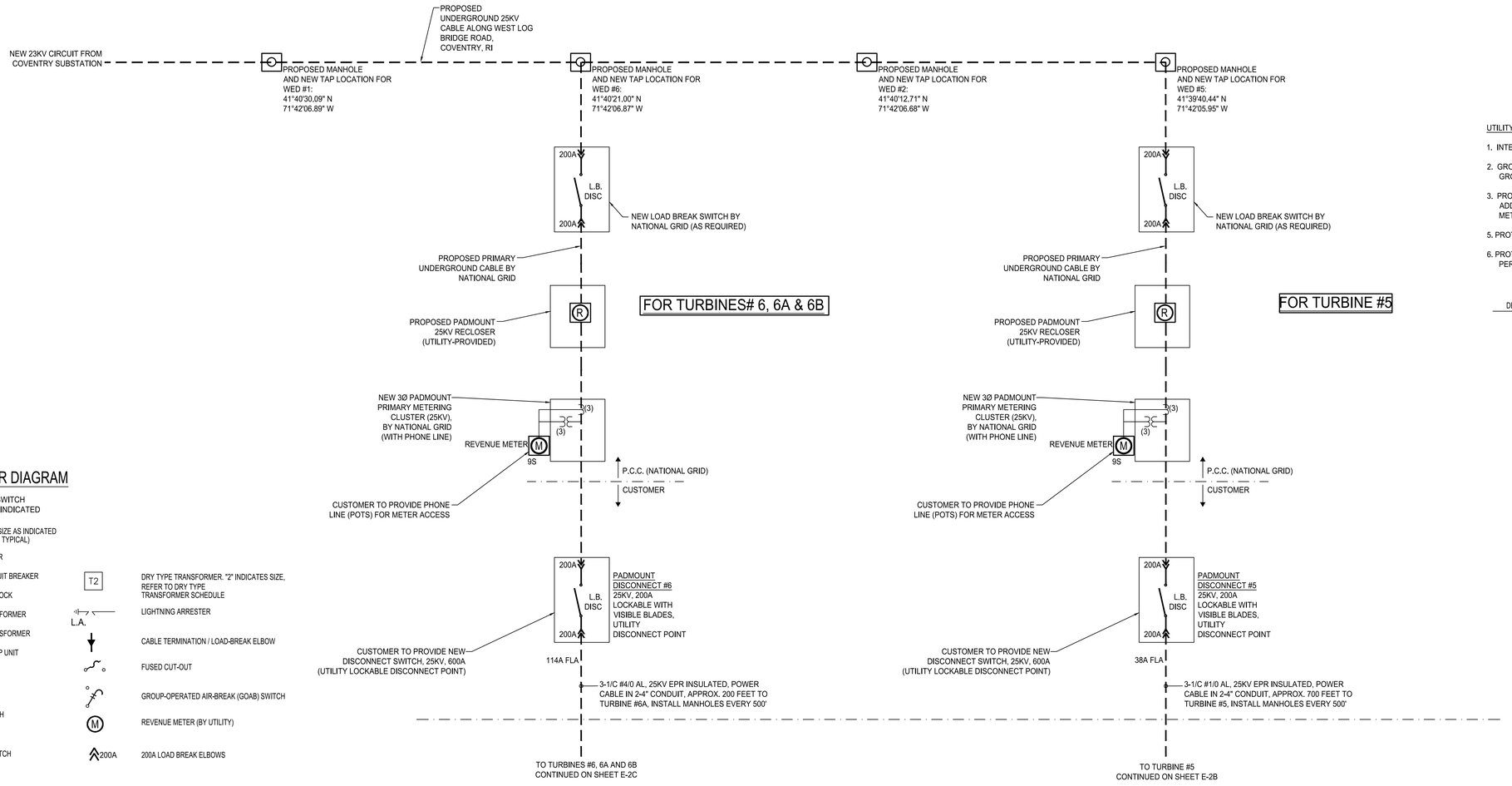
OFF OF PERRY HILL ROAD, COVENTRY RHODE ISLAND

PROJ. No.: 144D
DATE: JAN 2012
E-1C
SIZE: D | REV: 6



ONE LINE POWER DIAGRAM

- LOAD-BREAK SWITCH, FUSE, SIZE AS INDICATED
- TRANSFORMER, SIZE AS INDICATED (DELTA-WYE GND TYPICAL)
- CIRCUIT BREAKER
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- M — REVENUE METER (BY UTILITY)
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UTILITY INTERCONNECTION NOTES:

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59T	TIME OVERVOLTAGE RELAY
60	VOLTAGE BALANCE RELAY
81/O	OVER FREQUENCY RELAY
81/U	UNDER FREQUENCY RELAY

- PRIMARY
- SECONDARY
- OVERHEAD
- UNDERGROUND

DAVID J. COLOMBO
No. 8527
REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL
01-29-2015

TURBINE #5 IS CONNECTED TO A SINGLE NET METER
TURBINES #6, #6A & #6B ARE CONNECTED TO A SINGLE NET METER

No.	DATE	DESCRIPTION
4	1/29/2015	REVISED FOR 23KV INTERCONNECTION
3	9/17/2014	REVISED FOR GROUNDING TRANSFORMER
2	7/14/2014	REVISED FOR VENSYS TURBINE
1	7/7/2014	REVISED TURBINE CONFIGURATION
0	4/28/2014	ISSUED FOR REVIEW

REVISIONS

PROJ. MANAGER:
CHIEF DESIGNER:
REVIEWED BY: DATE

SEAL

SCALE: HORZ.:NONE VERT.:
DATUM: HORZ.: VERT.:
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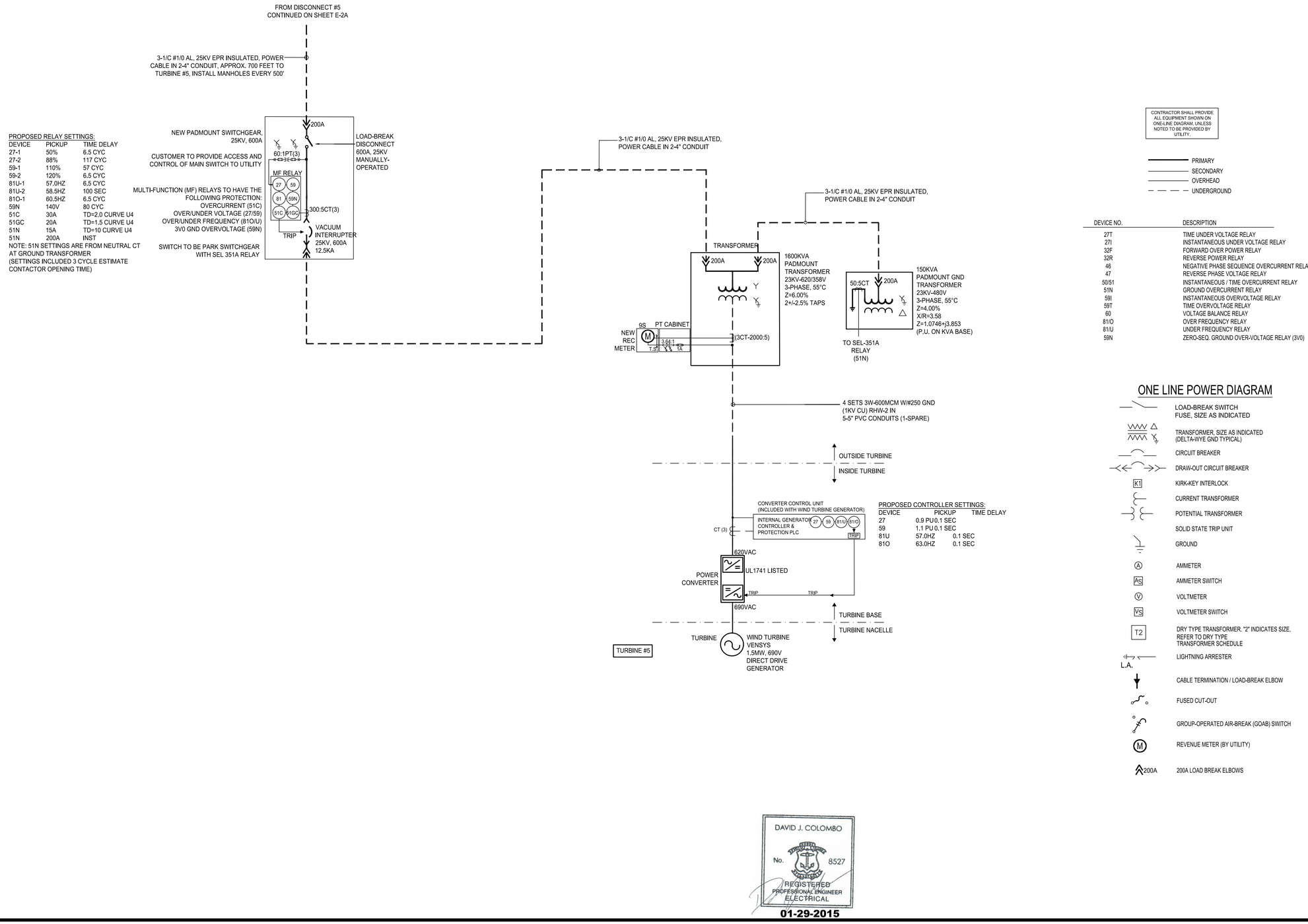
WIND ENERGY DEVELOPMENT, LLC
COVENTRY VICTORY HWY WIND TURBINES
PROPOSED ONE-LINE DIAGRAM
VICTORY HIGHWAY, COVENTRY RHODE ISLAND

PROJ. No.: 144D
DATE: APRIL 2014
E-2A
SIZE: D | REV: 4



DAVID J. COLOMBO
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ELECTRICAL

01-29-2015

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PROJ. No.: 144D
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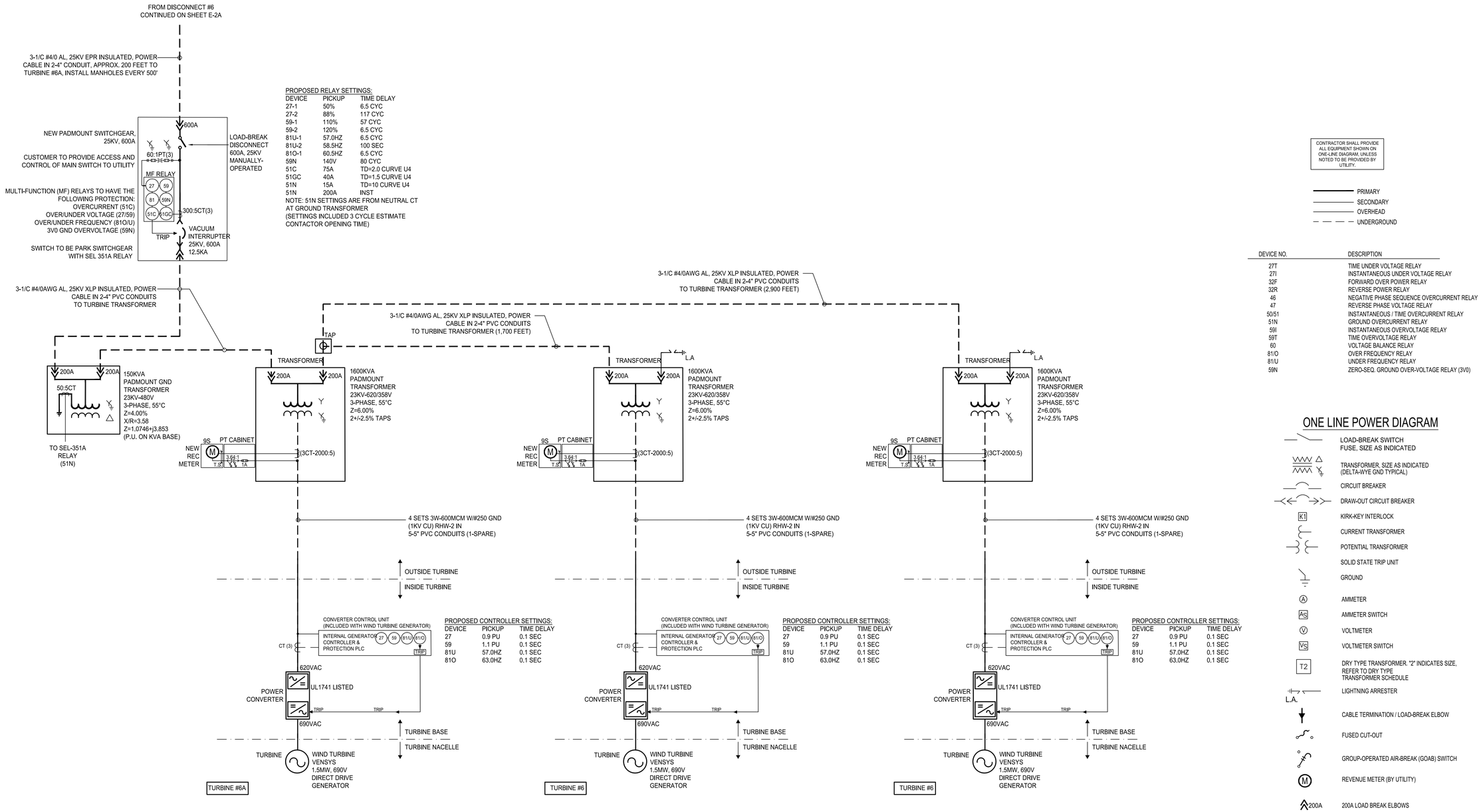

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PROJ. No.: 144D
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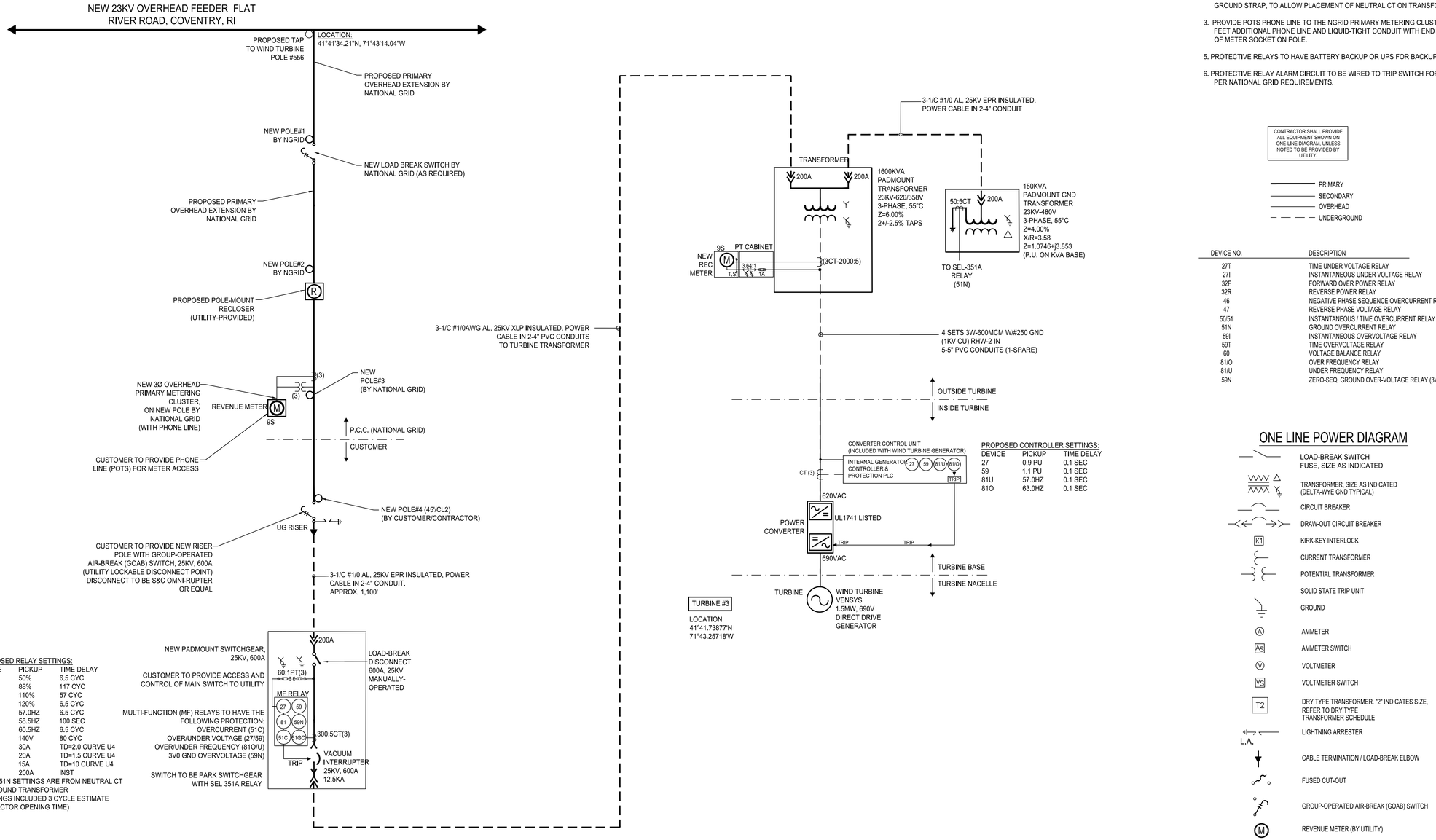

UTILITY INTERCONNECTION NOTES:

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CONTRACTOR SHALL PROVIDE ALL EQUIPMENT SHOWN ON ONE-LINE DIAGRAM, UNLESS NOTED TO BE PROVIDED BY UTILITY.

PRIMARY
SECONDARY
OVERHEAD
UNDERGROUND

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59T	TIME OVERVOLTAGE RELAY
60	VOLTAGE BALANCE RELAY
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- DRAW-OUT CIRCUIT BREAKER
- K1 KIRK-KEY INTERLOCK
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- SOLID STATE TRIP UNIT
- GROUND
- A AMMETER
- AS AMMETER SWITCH
- V VOLTMETER
- VS VOLTMETER SWITCH
- T2 DRY TYPE TRANSFORMER. "2" INDICATES SIZE, REFER TO DRY TYPE TRANSFORMER SCHEDULE
- L.A. LIGHTNING ARRESTER
- CABLE TERMINATION / LOAD-BREAK ELBOW
- FUSED CUT-OUT
- GROUP-OPERATED AIR-BREAK (GOAB) SWITCH
- M REVENUE METER (BY UTILITY)
- 200A 200A LOAD BREAK ELBOWS

DAVID J. COLOMBO
No. 8527
REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL
01-29-2015

No.	DATE	DESCRIPTION
4	1/29/2015	REVISED FOR 23KV INTERCONNECTION
3	9/17/2014	REVISED FOR GROUNDING TRANSFORMER
2	7/14/2014	REVISED FOR VENSYS TURBINE
1	7/7/2014	UPDATED INT APP
0	8/22/2013	ISSUED FOR REVIEW

REVISIONS

PROJ. MANAGER:
CHIEF DESIGNER:
REVIEWED BY: DATE

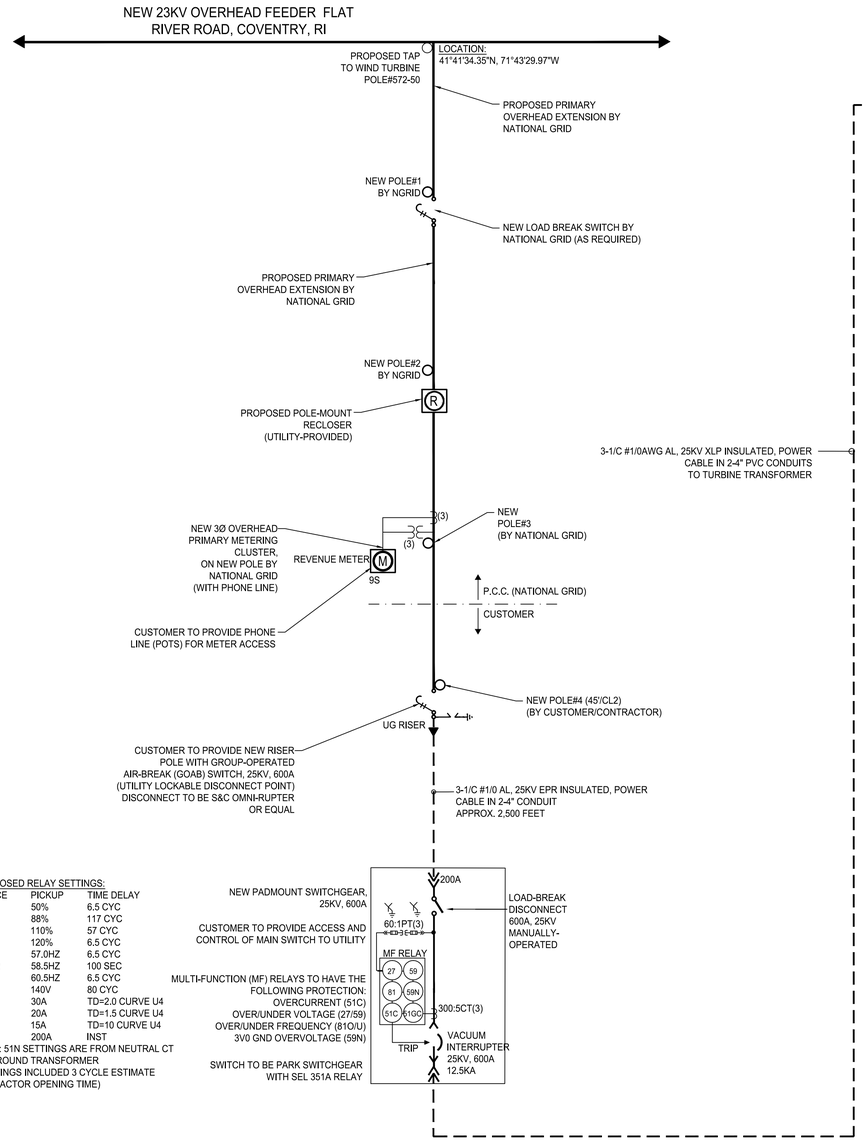
SEAL

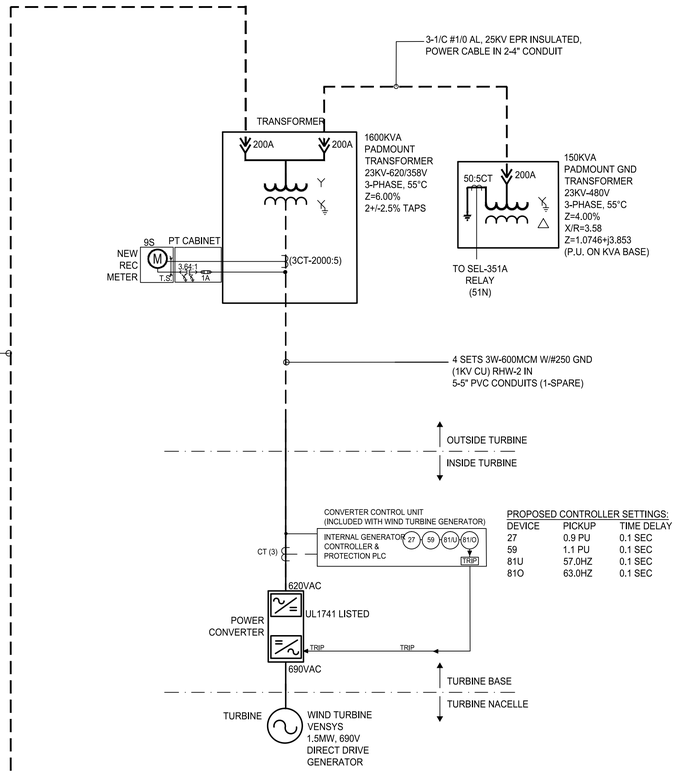
SCALE:
HORZ.:NONE
VERT.:
DATUM:
HORZ.:
VERT.:
0
GRAPHIC SCALE

POWER ENGINEERS, LLC
37 Fox Den Road
Kingston, MA 02364-2150
(508) 612-0382
www.PowerEngineersLLC.com
Electrical Engineering, Power, Lighting, Technical Studies and Utility Consulting

WIND ENERGY DEVELOPMENT, LLC
COVENTRY WIND#3 1.5MW WIND TURBINE
PROPOSED ONE-LINE DIAGRAM
FLAT RIVER ROAD, COVENTRY RHODE ISLAND

PROJ. No.: 144D
DATE: AUGUST 2013
E-1.3
SIZE: D REV: 4





PROPOSED CONTROLLER SETTINGS:

DEVICE	PICKUP	TIME DELAY
27	0.9 PU	0.1 SEC
59	1.1 PU	0.1 SEC
81U	57.0HZ	0.1 SEC
81O	63.0HZ	0.1 SEC

TURBINE #4

LOCATION
41°41'10.84"N
71°43'42.48"W

UTILITY INTERCONNECTION NOTES:

1. INTERFACE TRANSFORMER TO BE WYE PRIMARY AND SECONDARY.
2. GROUNDING TRANSFORMER TO HAVE INSULATED H0 BUSHING WITH EXTERNAL GROUND STRAP, TO ALLOW PLACEMENT OF NEUTRAL CT ON TRANSFORMER PRIMARY.
3. PROVIDE POTS PHONE LINE TO THE NGRID PRIMARY METERING CLUSTERS. PROVIDE 3 FEET ADDITIONAL PHONE LINE AND LIQUID-TIGHT CONDUIT WITH END NUT TO BOTTOM OF METER SOCKET ON POLE.
5. PROTECTIVE RELAYS TO HAVE BATTERY BACKUP OR UPS FOR BACKUP.
6. PROTECTIVE RELAY ALARM CIRCUIT TO BE WIRED TO TRIP SWITCH FOR REDUNDANCY PER NATIONAL GRID REQUIREMENTS.

CONTRACTOR SHALL PROVIDE ALL EQUIPMENT SHOWN ON ONE-LINE DIAGRAM, UNLESS NOTED TO BE PROVIDED BY UTILITY.

PRIMARY
SECONDARY
OVERHEAD
UNDERGROUND

DEVICE NO.	DESCRIPTION
27T	TIME UNDER VOLTAGE RELAY
27I	INSTANTANEOUS UNDER VOLTAGE RELAY
32F	FORWARD OVER POWER RELAY
32R	REVERSE POWER RELAY
46	NEGATIVE PHASE SEQUENCE OVERCURRENT RELAY
47	REVERSE PHASE VOLTAGE RELAY
50/51	INSTANTANEOUS / TIME OVERCURRENT RELAY
51N	GROUND OVERCURRENT RELAY
59I	INSTANTANEOUS OVERVOLTAGE RELAY
59T	TIME OVERVOLTAGE RELAY
60	VOLTAGE BALANCE RELAY
81/O	OVER FREQUENCY RELAY
81/U	UNDER FREQUENCY RELAY
59N	ZERO-SEQ. GROUND OVER-VOLTAGE RELAY (3V0)

ONE LINE POWER DIAGRAM

- LOAD-BREAK SWITCH FUSE, SIZE AS INDICATED
- TRANSFORMER, SIZE AS INDICATED (DELTA-WYE GND TYPICAL)
- CIRCUIT BREAKER
- DRAW-OUT CIRCUIT BREAKER
- K1 KIRK-KEY INTERLOCK
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- SOLID STATE TRIP UNIT
- GROUND
- A AMMETER
- As AMMETER SWITCH
- V VOLTMETER
- Vs VOLTMETER SWITCH
- T2 DRY TYPE TRANSFORMER. "2" INDICATES SIZE, REFER TO DRY TYPE TRANSFORMER SCHEDULE
- L.A. LIGHTNING ARRESTER
- CABLE TERMINATION / LOAD-BREAK ELBOW
- FUSED CUT-OUT
- GROUP-OPERATED AIR-BREAK (GOAB) SWITCH
- M REVENUE METER (BY UTILITY)
- 200A 200A LOAD BREAK ELBOWS

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1	7/7/2014	UPDATED INT APP
0	9/17/2013	ISSUED FOR REVIEW

REVISIONS

No.	DATE	DESCRIPTION

REVISIONS

PROJ. MANAGER:
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SEAL

SCALE:
HORZ.:NONE
VERT.:
DATUM:
HORZ.:
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GRAPHIC SCALE

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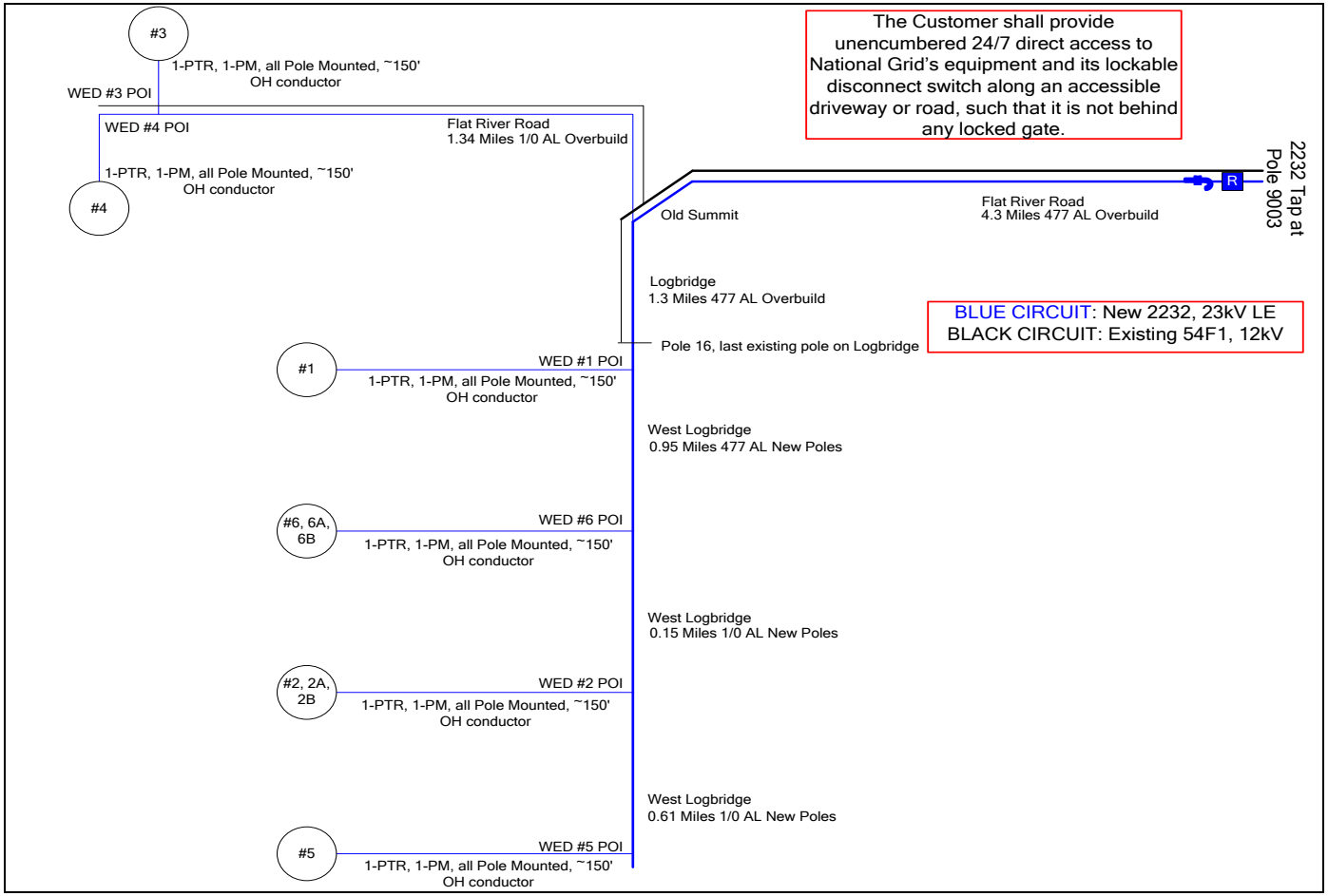
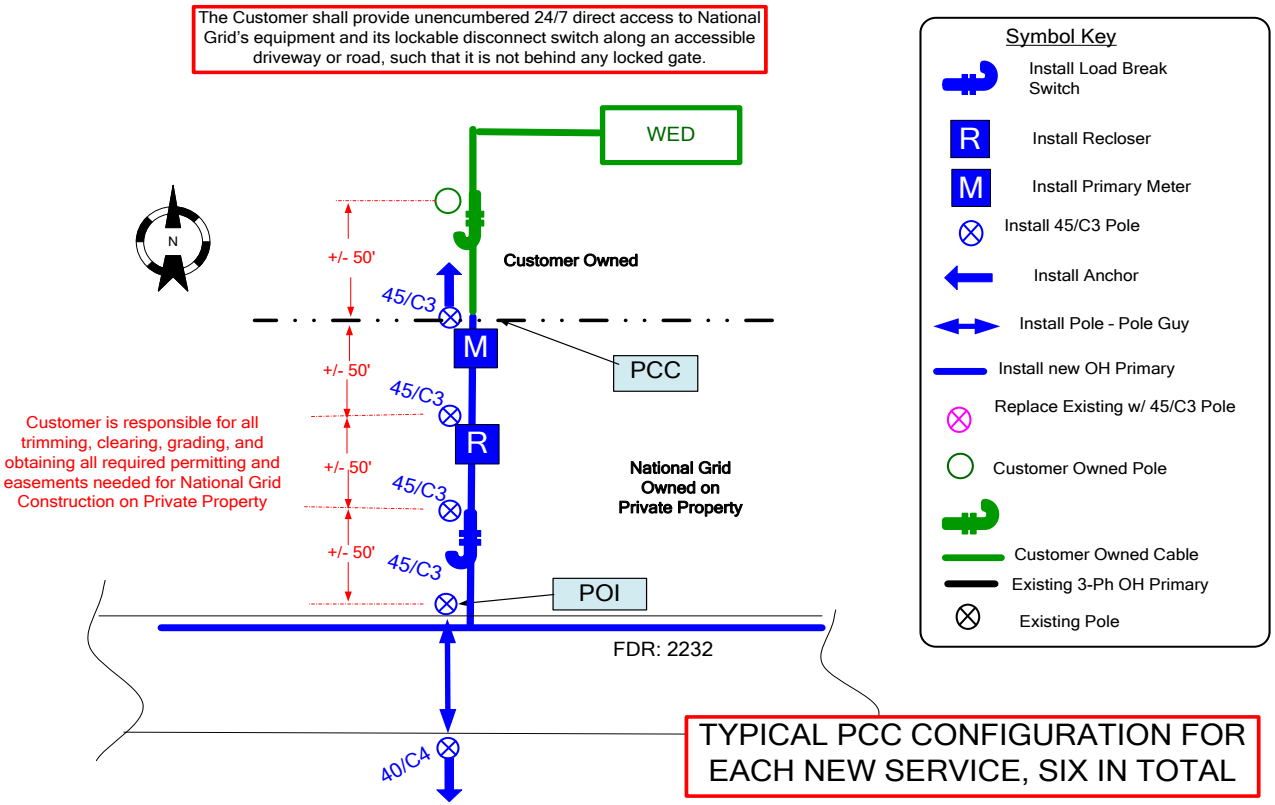
WIND ENERGY DEVELOPMENT, LLC
COVENTRY WIND#4 1.5MW WIND TURBINE
PROPOSED ONE-LINE DIAGRAM
FLAT RIVER ROAD, COVENTRY RHODE ISLAND

PROJ. No.: 144D
DATE: SEPT 2013
E-1.4
SIZE: D REV: 4

Appendix B EPS Modifications


#3
1-PTR, 1-PM, all Pole Mounted, ~150' OH conductor
WED #3 POI
WED #4 POI
Flat River Road
1.34 Miles 1/0 AL Overbuild
1-PTR, 1-PM, all Pole Mounted, ~150' OH conductor
#4
The Customer shall provide unencumbered 24/7 direct access to National Grid's equipment and its lockable disconnect switch along an accessible driveway or road, such that it is not behind any locked gate.
2232 Tap at Pole 9003
R
Old Summit
Flat River Road
4.3 Miles 477 AL Overbuild
Logbridge
1.3 Miles 477 AL Overbuild
BLUE CIRCUIT: New 2232, 23kV LE
BLACK CIRCUIT: Existing 54F1, 12kV
Pole 16, last existing pole on Logbridge
#1
WED #1 POI
1-PTR, 1-PM, all Pole Mounted, ~150' OH conductor
West Logbridge
0.95 Miles 477 AL New Poles
#6, 6A, 6B
WED #6 POI
1-PTR, 1-PM, all Pole Mounted, ~150' OH conductor
West Logbridge
0.15 Miles 1/0 AL New Poles
#2, 2A, 2B
WED #2 POI
1-PTR, 1-PM, all Pole Mounted, ~150' OH conductor
West Logbridge
0.61 Miles 1/0 AL New Poles
#5
WED #5 POI
1-PTR, 1-PM, all Pole Mounted, ~150' OH conductor


The Customer shall provide unencumbered 24/7 direct access to National Grid's equipment and its lockable disconnect switch along an accessible driveway or road, such that it is not behind any locked gate.
WED
N
+/- 50'
Customer Owned
45/C3
M
PCC
+/- 50'
45/C3
R
Customer is responsible for all trimming, clearing, grading, and obtaining all required permitting and easements needed for National Grid Construction on Private Property
+/- 50'
45/C3
National Grid Owned on Private Property
+/- 50'
45/C3
POI
FDR: 2232
40/C4
Symbol Key
Install Load Break Switch
Install Recloser
Install Primary Meter
Install 45/C3 Pole
Install Anchor
Install Pole - Pole Guy
Install new OH Primary
Replace Existing w/ 45/C3 Pole
Customer Owned Pole
Customer Owned Cable
Existing 3-Ph OH Primary
Existing Pole
TYPICAL PCC CONFIGURATION FOR EACH NEW SERVICE, SIX IN TOTAL

Begin forwarded message:

From: "Kennedy, John C." <John.Kennedy@nationalgrid.com>
Date: February 4, 2015 at 5:03:29 PM EST
To: "Kennedy, John C." <John.Kennedy@nationalgrid.com>, "Mark(Wind) Depasquale" <md@wedenergy.com>
Cc: "Kelly, Kevin G." <Kevin.Kelly2@nationalgrid.com>, "LaBrake-Jr, Neil F." <Neil.LaBrake-Jr@nationalgrid.com>, "George, Caleb" <caleb.george@nationalgrid.com>, 'David Colombo' <Dave@PowerEngineersLLC.com>
Subject: RE: WED Coventry 1-6; 23kV Interconnection and Impact Study

i Mark,

Checking in to see if there are any new developments with your dealings with ISO-NE; any changes to POI's? We have initiated the Transmission Planning Study at your request of the 23kV interconnection. We also modified what the OH option estimate will provide per our conversation Monday and I made changes noted below. Revised site plan for West Log Bridge Rd are still required at this point.

You had also inquired on WED procuring and installing HV cable for the underground option. National Grid will not allow that. I have a hard copy of our Electric System Bulletin #759B Underground Commercial Distribution and Responsibility Guide for you next time we meet which will apply in this case.

Please let me know if you have any questions.

Thanks,

From: Kennedy, John C. [mailto:John.Kennedy@nationalgrid.com]
Sent: Thursday, May 01, 2014 10:30 PM
To: Mark(Wind) Depasquale; Laura Anthony; 'David Colombo'; George, Caleb
Cc: Enayati, Babak; Isberg, John F.
Subject: RE: Wind Energy Development: Coventry I - IV

Mark et al,

I am providing agenda, my notes and next steps from today's meeting below. Please confirm and/or provide edits, additions if I may have missed anything in our discussion.

Agenda:

To provide:

- A technical review of recent results for Coventry I & II Impact Study for Renewable DG and review of estimated construction timelines.
- A review of results of Feasibility Studies conducted for Coventry III & IV and timeline of requested ISRDG.
- Discussion of impacts on National Grid's electrical power system by all four projects.

Mark,

Once we complete discussion on the wind turbine projects I'd like to discuss the NK Green account also.

Notes/Next Steps:

- Coventry I & II ISRDG
- 18-24 month estimated timeline of design and construction from time of Interconnection Service Agreement(ISA) execution will not allow enough time to provide Output Demonstration Test results by February 2, 2015.
- Three part payment plan will be incorporated into ISA when requested.
- NGrid will revise study to provide only one-Loadbreak Switch, one-pole top recloser and two primary metering assemblies(one DG Contract WTG, one for Net Metering WTG) at WED's request.
- WED will consult with Goldwind Americas to determine if WTG inverter is UL Listed and provide results to NGrid. If UL Listed consideration of anti-islanding protection requirement to be made.
- NGrid to determine what generation value would negate anti-islanding protection(Direct Transfer Trip) requirement for Coventry I if WED determines that they wish to execute ISA and result might allow reduction of design/construction timeline. More discussion needed.
- General Discussion of WED's proposed installation of 7 – 1.5mW WTG's in Coventry, RI
- WED informed NGrid that they are proposing a total of 7 WTG's and that they will provide site plan detailing WTG locations
- NGrid to provide high level interconnection review based on site plan provided, distribution circuits available, and below information.
- Coventry I - DG Contract
- Coventry II, IIa, IIb – Net Metered
- Coventry III, IV – Net Metered
- Coventry V – DG Contract
- WED proposed one point of interconnection for III and IV by crossing public way(underground). This would not be allowed as it would infringe on NGrid's franchise rights.
- WED proposed contracting with NGrid's recommended contractors in an effort to shorten overall timeline

for NGrid distribution line construction required for all WTG system impacts. NGrid indicated that this proposal had been made by others and would not be allowed but would bring up again within organization.

- WED and NGrid agreed to continue high level review and to meet Friday, May 9th. Goldwind Americas to be present. Meeting notice provided.

- NK Green Account

- We agreed that we would discuss plan to bring account current on Thursday, May 8th. Meeting notice provided for Wednesday, May 7th due to conflict in schedule.

Thank you for your time today and we look forward to next week's meetings.

Best regards,

John Kennedy

nationalgrid

Lead Technical Support Consultant - RI

Technical Sales and Engineering Support

Office: 401-784-7221

Please select the appropriate link below for the latest DG information:

National Grid's DG Website(RI)

RIPUC No.2078 Standards for Connecting Distributed Generation

RIPUC No.2075 Net Metering Provision

IESB No.756 Requirements for Parallel Generation

-----Original Appointment-----
From: Kennedy, John C.
Sent: Monday, April 21, 2014 11:51 AM
To: Kennedy, John C.; 'Mark(Wind) Depasquale'; David Colombo; George, Caleb; Enayati, Babak; Isberg, John F.
Subject: Wind Energy Development: Coventry I - IV
When: Thursday, May 01, 2014 10:00 AM-11:00 AM (GMT-05:00) Eastern Time (US & Canada).
Where: CR- Providence - S(14) Melrose St - Business Services

Sending again for all to reply.

Thanks,

To provide:

- A technical review of recent results for Coventry I & II Impact Study for Renewable DG and review of estimated construction timelines.
- A review of results of Feasibility Studies conducted for Coventry III & IV and timeline of requested ISRDG.
- Discussion of impacts on National Grid's electrical power system by all four projects.

Mark,

Once we complete discussion on the wind turbine projects I'd like to discuss the NK Green account also.

Thanks,

John

From: Kennedy, John C. [mailto:John.Kennedy@nationalgrid.com]
Sent: Thursday, July 03, 2014 9:38 AM
To: Mark(Wind) Depasquale
Cc: George, Caleb; Kelly, Kevin G.; LaBrake-Jr, Neil F.; Distributed.Generation
Subject: WED WTG Projects - 6 in Total

Mark,

Per our conversation yesterday; we agreed to perform one study for the six interconnection applications(4 existing, to be revised and 2 new, to be submitted) of your newly proposed 15mW wind turbine generator project . All points of common coupling will be net metered. Once all revised and new project documents (applications, one-lines, site plans, spec sheets) are received and processed I will prepare the Impact Study for Renewable DG (ISRDG) agreement.

The total fee will be $50,000 in line with what would have been charged if we conducted separate studies for each application(Coventry 1 ISRDG would have been revised with no fee, as discussed). The order in which you have prioritized the six projects is: Cov 2(2a,2b), 3, 4, 1, 6(6a,6b), and 5. If this order or total installation is altered (removing one or more WTG's from the total project) it may require an additional study and associated fee).

We will hold to the tariff timelines and expedite each step as we are able. Our ability to do so is directly related to you providing required documents and data requested in a timely manner. All revised and new documents should be sent to our distributed.generation@nationalgrid.com email address.

For reference, the DG Work Request numbers existing are as follows:

Coventry 1: 14319785

Coventry 2: 14462941

Coventry 3: 15640455

Coventry 4: 15772951

I understand that you intend to order equipment prior to receiving a completed ISRDG for this total project. We caution and urge all of our DG customers to not order equipment until they have a completed ISRDG and Interconnection Service Agreement(ISA)in hand so that they have a full understanding of required system modifications to our electric power system, construction timeline and associated costs.

We look forward to working with you towards a successful interconnection of this renewable energy project.

Best regards,

John Kennedy

nationalgrid

Lead Technical Support Consultant - RI

Technical Sales and Engineering Support

From: "Kennedy, John C." <John.Kennedy@nationalgrid.com>
Date: November 3, 2014 at 10:17:17 AM EST
To: "Mark(Wind) Depasquale" <md@wedenergy.com>
Subject: FW: substation addresses & ISO-NE

Mark,
Please find below the substation addresses that are involved with Coventry 1-6 interconnections. WED Coventry 2, 3, 4, and 1 are on the 54F1 and proposed in that order. 6 and 5 are on 63F6 and proposed in the order listed. ISO- NE Operating Procedures 14 and 18 should be referenced which I had provided to you already. The link below is also handy.
We will be in touch with ISO-NE today/tomorrow. I will touch base with you once complete.

From: Kennedy, John C. [mailto:John.Kennedy@nationalgrid.com]
Sent: Tuesday, November 04, 2014 3:41 PM
To: Mark(Wind) Depasquale; 'David Colombo'; George, Caleb; Kamal, Rashed; Ryan, James W. (US-WBRO-Ops); 'nreis@controlpointtech.com'
Subject: WED Coventry 1-6: 10/31 Meeting Notes

All,

Please review attached and let me know if anything needs editing.

Mark,

Regarding DTT and communication required point to point: Please provide us with your proposed plan, for our review/approval, detailing how all generator breakers will be taken off line(tripped) within the 2 second tariff requirement. This is needed for us to progress the study and will impact substation modifications. I believe Vensys was to provide you with some detail with a proposal for bring the leased line to one point within project sites.

Note: other than the leased line for DTT; a point to point radio system would be an option. It would require a 3rd party to study the line of sight potential from you turbine sites to our substations.

Please contact me with any questions.

Thanks,

John Kennedy

nationalgrid

Lead Technical Support Consultant - RI

Technical Sales and Engineering Support

Office: 401-784-7221

Please select the appropriate link below for the latest DG information:

National Grid's DG Website(RI)

RIPUC No.2078 Standards for Connecting Distributed Generation

Gmail

Clarification documents

Mark(Wind) Depasquale <md@wedenergy.com> Tue, Nov 11, 2014 at 6:17 PM
To: "Kennedy, John C. (John.Kennedy@nationalgrid.com)" <John.Kennedy@nationalgrid.com>
Cc: "P. E. David J. Colombo (Dave@PowerEngineersLLC.com)" <Dave@powerengineersllc.com>, "t.peters@vensys.de" <t.peters@vensys.de>, "Mark(Wind) Depasquale" <md@wedenergy.com>

John, Enclosed documents from the manufacture, section 11 shows the ramp up / delay settings. It is possible to adjust this settings if required. This should be everything you need to answers Caleb's question.

Now regarding your anti-islanding comment below in quotes:

· "A revised letter providing National Grid with assurance that you will seek no claims against us with regard to requiring Direct Transfer Trip in the associated Impact Study for Renewable DG pending for all of the wind turbine generators; Coventry 1-6, as a result of following your instructions to not perform an anti-islanding study for these six interconnection projects that are proposed to interconnect as follows: Coventry Substation. 54F1; WED Coventry 1, 2. 2a. 2b. 3 and 4. Hopkins Hill Substation, 63F6: WED Coventry 5 & 6. "

CAN NATIONAL GRID ANSWER THE FOLLOWING.

1. National Grid said if we cannot supply UL listing, we have to install the anti-islanding equipment at both substations?

2. WED told National Grid, we could not give them a UL listing.

3. National Grid states that even if we give a UL Listing, we may still be required to install anti-islanding equipment at the substation.

4. If we are installing anti-islanding and have been studying it since June 17, 2013 (second time around), doesn't National Grid have this under control?

5. This is a dead issue, we are installing anti-islanding equipment because NG says we have to.

6. If National Grid is doing something wrong that will cause this to go into litigation later, please tell us what it is so we can resolve it.

IF WE ARE DESIGING THE SYSYEM WITH ANTI-ISLANDING AND DTT LINES, WHY ARE WE TALKING ABOUT THE STUDY

DDT Lines

The respective entities that own the systems will be installing individual DTT lines for each interconnection and will be billed separately by Verizon on separate bills. Four lines from the Coventry Substation to WED Coventry One, Two, Three and Four. Two DTT lines from Hopkins Hills to WED Coventry Five and Six.

Point to point seems problematic due to there be six different owners

EACH OF THE SIX ENTITIES WILL HAVE THEIR OWN DEDICATED DTT LINE

-

John, it concerns me that National Grid is concerned about litigation. Wind Energy Development wants align themselves with National Grid in good faith. It is obvious that the renewable energy industry needs to move forward in RI which National Grid supports 100%.

I am trying to complete this interconnection study that we started June of 2013. We need to put behind us ideas of litigation and we need to complete this impact study because this project will be online August of 2015. We have all worked very hard to get where we are today. Once we receive the completed study, we will be paying the fee and National Grid will design the project, install the six individual projects, and then will audit the projects at the completion and will only charge me what is allowed by law. At the end of the process, if there is remaining funds due to the entities, the entities will be refunded by NG.

We are hopeful and confident that National Grid shares in our good faith

I look forward to our conference call on Friday to close all remaining open items.

Mark DePasquale

WIND ENERGY

3760 Quaker Lane

North Kingstown, RI 02852

Office: 401-295-4998 Ext. 103

Fax: 401-295-4944

From: Kennedy, John C. [mailto:John.Kennedy@nationalgrid.com]
Sent: Friday, January 23, 2015 4:30 PM
To: Mark(Wind) Depasquale; 'David Colombo'
Cc: George, Caleb; Kelly, Kevin G.
Subject: Cov. 1-6 23kv Interconnection Study

Mark,

Spotty call just now; to recap:

Much progress made in vetting 23kv; 3V0 not required at station, DTT analysis is almost done and we expect to know Monday if required or not.

At this point to begin study we will need revised one-lines and site plans(only for POI's that have changed) – David can contact Caleb directly to facilitate.

Let's talk Monday on status of West Log Bridge Rd for Cov. 5 & 6 POI's. We need to have a conversation on Transmission Planning Study and ISO-NE also.

Have a great weekend in Jackman,

John Kennedy

nationalgrid

Lead Technical Support Consultant - RI

Technical Sales and Engineering Support

Exhibit_E_Impact_Study
_Agreemen...onnect.pdf

From: "Kennedy, John C." <John.Kennedy@nationalgrid.com>
Subject: **RE: WED Coventry 1-6; 23kV Interconnection and Impact Study**
Date: February 4, 2015 at 5:03:28 PM EST
To: "Kennedy, John C." <John.Kennedy@nationalgrid.com>, "Mark(Wind) Depasquale" <md@wedenergy.com>
Cc: "Kelly, Kevin G." <Kevin.Kelly2@nationalgrid.com>, "LaBrake-Jr, Neil F." <Neil.LaBrake-Jr@nationalgrid.com>, "George, Caleb" <caleb.george@nationalgrid.com>, 'David Colombo' <Dave@PowerEngineersLLC.com>

Hi Mark,
Checking in to see if there are any new developments with your dealings with ISO-NE; any changes to POI's? We have initiated the Transmission Planning Study at your request of the 23kV interconnection. We also modified what the OH option estimate will provide per our conversation Monday and I made changes noted below. Revised site plan for West Log Bridge Rd are still required at this point.

You had also inquired on WED procuring and installing HV cable for the underground option. National Grid will not allow that. I have a hard copy of our Electric System Bulletin #759B Underground Commercial Distribution and Responsibility Guide for you next time we meet which will apply in this case.

Please let me know if you have any questions.

Thanks,

John Kennedy

nationalgrid
Lead Technical Support Consultant - RI
Technical Sales and Engineering Support
Office: 401-784-7221

Please select the appropriate link below for the latest DG information:
National Grid's DG Website(RI)
RIPUC No.2078 Standards for Connecting Distributed Generation
RIPUC No.2075 Net Metering Provision
ESB No.756 Requirements for Parallel Generation

From: Kennedy, John C.
Sent: Friday, January 30, 2015 4:01 PM
To: 'Mark(Wind) Depasquale'
Cc: Kelly, Kevin G.; LaBrake-Jr, Neil F.; George, Caleb; 'David Colombo'
Subject: WED Coventry 1-6; 23kV Interconnection and Impact Study

Mark,
It was great to speak with you this morning. To recap our meeting please see below and let me know if any edits or additions are needed.

- Caleb and his team have completed enough analysis of the 23kV sub-transmission circuit to determine that 3V0 and DTT will not be required.
- We agreed that National Grid will provide an Impact Study of the 23kV sub-transmission

interconnection. Impact Study fees will not be charged at this point and will be included in the payment plan of the Interconnection Service Agreement(ISA). We will include the tariff fee of $10,000 per application/POI totaling $60,000 in study fees at time of ISA. Note: I failed to mention it during our call; as a point of information, National Grid has incurred approximately $100,000 in consulting fees alone for Coventry 1-6.

- The study will provide an estimate of system modification which will include an overhead line extension of the 2232 circuit along Flat River Rd to Coventry 3 and Coventry 4; along Log Bridge and West Log Bridge Roads to the cul de sac on West Log Bridge Road. The estimate will also include an **overhead** ~~underground~~ line extension from the cul de sac on West Log Bridge Road to Coventry 1, 2, 5, and 6. ~~WED will design, provide necessary permits, procure and construct the manhole and duct system per National Grid's construction and material standards. MH/Duct system will be conveyed to National Grid prior to National Grid installing cable. The mh/duct installation will be subject to a donated property tax. Further details of this arrangement to be provided at a later date.~~
- The study will also provide an estimate of system modification which will include an underground line extension of the 2232 circuit along Flat River Rd to Coventry 3 and Coventry 4; along Log Bridge and West Log Bridge Roads to Coventry 1, 2, 5, and 6. WED will design, provide necessary permits, procure and construct the manhole and duct system per National Grid's construction and material standards. MH/Duct system will be conveyed to National Grid prior to National Grid installing cable. The mh/duct installation will be subject to a donated property tax. Further details of this arrangement to be provided at a later date.

- We received the revised one-lines yesterday. We also received the rendering of POI's for Coventry 1, 2,5 & 6 on Wednesday of this week. **A more definitive site plan will be required prior to completion of the study showing property lines and limits of public way.**
- We reviewed that the overhead extension estimate of the study will be completed first as the underground extension will need to be modeled. National Grid will endeavor to provide the 23kV interconnection Impact Study and estimates of both options as soon as possible.

Please let me know if you have any questions.

Enjoy the weekend – Go Pats!,

John Kennedy

nationalgrid
Lead Technical Support Consultant - RI
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ESB No.756 Requirements for Parallel Generation

From: Kennedy, John C. [mailto:John.Kennedy@nationalgrid.com]
Sent: Friday, February 13, 2015 3:20 PM
To: 'Mark(Wind) Depasquale'
Cc: Stephen Brusini; 'P. E. David J. Colombo (Dave@PowerEngineersLLC.com)'; Stephen Brusini; 'Kara Bennett'; Kelly, Kevin G.
Subject: RE: WED Coventry 1-6 Combined Study Agreement -23kV Interconnection & PCC Confirmation Reply

Mark,

I am very surprised by your response to my providing the impact study agreement to you. Respectfully, we are not currently under an impact study agreement. The impact study agreement you reference was for projects Coventry 1-6 related to the 12kV interconnection only. Since the review of that completed 12kV impact study, held on December 19th, we presented you with two options: (1) a further study of the 12kV interconnections with new generation data that Vensys would provide, and/or (2) embark on a new study incorporating a new sub-transmission circuit. All discussion and correspondence since December 19th has related and indicated that a new study, study agreement and associated fees would be required to study a sub-transmission circuit interconnection.

On January 15th, we collectively reviewed the study fee payment arrangement contained within the 23kV study agreement, with Kevin Kelly present, and you clearly stated that you understood. This arrangement was again reiterated in the attached email sent to you on January 30th.

With [illegible]

with regard to what you describe below in how the 12kV Combined Study progressed and what that completed study provided: I respectfully disagree. I am happy to hear that you are in communication with ISO-NE and there has been no change to Point of Common Coupling(PCC) locations; please keep me posted with any new information. The Transmission Planning Study is underway.

The 23kV Combined Impact Study with the overhead estimate is complete and presently undergoing internal review. The only item that would delay National Grid in providing you with the completed study, would be any delay in your signing the impact study agreement. National Grid must have a signed impact study agreement for this particular impact study to comply with its tariff and internal company procedures under the tariff. Otherwise we cannot issue a new impact study. There is nothing in the impact study agreement I sent you that is different from the terms we previously agreed to in our discussions and that were detailed in the January 30th email.

The National Grid team has endeavored to provide you with the sub-transmission interconnection Impact Study well ahead of our 30 day commitment and well before the end of the tariff timeline. This has all been in an effort to assist you in meeting your project timelines. I sincerely hope that you understand National Grid's strong commitment in progressing your projects to the next step.

Best regards,

John Kennedy

nationalgrid
Lead Technical Support Consultant - RI
Technical Sales and Engineering Support
Office: 401-784-7221

Please select the appropriate link below for the latest DG information:
National Grid's DG Website(RI)
RIPUC No.2078 Standards for Connecting Distributed Generation
RIPUC No.2075 Net Metering Provision
ESB No.756 Requirements for Parallel Generation

From: Mark(Wind) Depasquale [mailto:md@wedenergy.com]
Sent: Thursday, February 12, 2015 4:34 PM
To: Kennedy, John C.
Cc: Stephen Brusini; 'P. E. David J. Colombo (Dave@PowerEngineersLLC.com)'; Stephen Brusini; Kara Bennett
Subject: WED Coventry 1-6 Combined Study Agreement -23kV Interconnection & POI Confirmation Reply

John:

We've been over this. We're under an impact study agreement right now as described in your letter of August 14, 2014, which added COV2A through 6B onto the existing study for COV1&2. You were to study the most effective/efficient means to interconnect those turbines to the distribution system. Your study overlooked the much simpler and cheaper interconnection method that is under consideration now, opting for a $13 million plan the vast majority of which

expense was to rebuild your system. It also made major mistakes, including overlooking the loading data we gave you for the planned Vensys turbines. The study you sent us said you would re-run the study with better data from the customer, and you are now doing that. As I've said, we're willing to pay reasonable engineering fees associated with this when assessed at the time of operation, as provided by the statute.

We are in communication with ISO and will give you any meaningful updates when we have them.

We will also send you the requested site plan, but that need not slow down your study.

Mark

Mark DePasquale

WIND ENERGY Development llc

3760 Quaker Lane
North Kingstown, RI 02852
Office: 401-295-4998 Ext. 103
Fax: 401-295-4944
md@wedenergy.com

P Please consider the environment before printing this email.

From: **Gonzalez, Monica** mgonzalez@iso-ne.com
Subject: RE: West Coventry Wind
Date: February 23, 2015 at 10:21 AM
To: **Handy, Seth** seth@handylawllc.com, **Forrest, David** dforrest@iso-ne.com
Cc: **Wilkinson, Eric** EWilkinson@iso-ne.com, **Columbo, Dave** dave@powerengineersllc.com, **Mark(Wind) Depasquale** md@wedenergy.com, **Schulte, Jason** jschulte@iso-ne.com, **Roughan, Timothy** timothy.roughan@nationalgrid.com, **Downey, Amanda** Amanda.Downey@nationalgrid.com, **Schwennesen, Terry** terry.schwennesen@nationalgrid.com

Hi Seth,

The questions you posed regarding ISO's involvement, in our opinion, would be best addressed by National Grid. At issue here is not whether the interconnection of the West Coventry units is FERC or state jurisdictional. National Grid has already determined that the interconnection of the units is state jurisdictional. ISO's involvement comes into play with respect to National Grid's requirements to offer the units' in the ISO markets and requirements related to the assessment of adverse impacts on the regional system, both of which fall wholly within FERC's jurisdiction. As your questions relate to National Grid's obligations, we have reached out to National Grid (copied in this email) to see whether they can support a meeting on March 2. If they are not available, we may need to reschedule for a date that works for all relevant parties. I will endeavor to finalize meeting logistics today.

Separately, in your letter, you mention that you and your team will be attending the meeting. Can you send me the names and full contact information for each of the individuals that plan to attend the meeting in person? I need that information to process visitors' requests.

Thanks in advance.

Best,

Monica Gonzalez
Senior Regulatory Counsel
ISO New England Inc.
One Sullivan Road, Holyoke, MA 01040
Tel: 413-535-4178, Fax: 413-535-4379
E-mail: mgonzalez@iso-ne.com

From: **Roughan, Timothy R.** Timothy.Roughan@nationalgrid.com
Subject: **RE: Re: [EXT] West Coventry Wind**
Date: **February 24, 2015 at 1:40 PM**
To: **Gonzalez, Monica** mgonzalez@iso-ne.com, **Handy, Seth** seth@handylawllc.com
Cc: **Forrest, David** dforrest@iso-ne.com, **Wilkinson, Eric** EWilkinson@iso-ne.com, **Columbo, Dave** dave@powerengineersllc.com, **Mark(Wind) Depasquale** md@wedenergy.com, **Schulte, Jason** jschulte@iso-ne.com, **Downey, Amanda** Amanda.Downey@nationalgrid.com, **Schwennesen, Terry L.** Terry.Schwennesen@nationalgrid.com, **Webster, Raquel** Raquel.Webster@nationalgrid.com, **OBrien, Celia** CELIA.OBRIEN@nationalgrid.com

Seth/Monica,

Please see the language which requires assets to be set up to earn wholesale energy revenues. The background is the requirement to use wholesale energy revenues to offset the costs paid for by all other customers in RI to fund renewable energy programs.

In the current net metering tariff (RI PUC 2075), section II(8) reads:

> As a condition to receiving any payments pursuant to this provision, Customers who install Eligible Net Metering Systems with a nameplate capacity in excess of 60 kW must comply with any and all applicable New England Power Pool ("NEPOOL") and ISO-NE rules, requirements, or information requests that are necessary for the Eligible Net Metering System's electric energy output to be sold into the ISO-NE administered markets. If the Company must provide to NEPOOL or ISO-NE any information regarding the operation, output, or any other data in order to sell the output of the Eligible Net Metering System into the ISO-NE administered markets, the Eligible Net Metering System must provide such information to the Company in a timely manner.

The proposed new tariff reads:

> As a condition to receiving any payments pursuant to this provision, customers who install Eligible Net Metering Systems with a nameplate capacity in excess of 25 kW must comply with any and all applicable NEPOOL and ISO-NE rules, requirements, or information requests that are necessary for the Eligible Net Metering System's electric energy output to be sold into the ISO-NE administered markets. If the Company must provide to NEPOOL or ISO-NE any information regarding the operation, output, or any other data in order to sell the output of the Eligible Net Metering System into the ISO-NE administered markets, the customer who

installs an Eligible Net Metering System must provide such information to the Company prior to the project being authorized to operate in parallel with the Company's electric distribution system.

Under the proposed REG tariff – section 7(b):

> The Applicant for a DG Project shall provide all necessary information to, and cooperate with, the Company to enable the Company to obtain the appropriate asset identification for reporting generation to ISO-NE and the NEPOOL Generation Information System for the creation of RECs, designate the Company, or another party as directed by the Company, as the Applicant's Responsible Party under the NEPOOL-GIS rules, and direct all RECs from the DG Project to the Company's appropriate NEPOOL-GIS account. If requested by the Company, Applicant will provide approvals or assignments, as necessary, to facilitate Applicants participation in asset aggregation or other model of asset registration and reporting.

Tim Roughan
Director of Energy and Environmental Policy
National Grid
781-907-1628