STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

CASE 12-T-0502 – Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades

CASE 13-E-0488 – In the Matter of Alternating Current Transmission Upgrades – Comparative Proceeding

CASE 13-T-0461 - Application of Boundless Energy NE, LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII for Leeds Path West Project.

BOUNDLESS ENERGY NE, LLC'S
JANUARY 7, 2015 FILING

E. John Tompkins
Chief Executive Officer
Boundless Energy NE, LLC

By Email and Electronic Filing

Hon. Kathleen H. Burgess
Secretary to the Commission
New York Public Service Commission
Agency Building 3
Empire State Plaza
Albany, New York 12223-1350

January 7, 2015

Re: Boundless Energy NE, LLC's Initial Application in the Energy Highway Initiative Proceeding – Cases 12 –T – 0502 and 13-T-0461

Dear Secretary Burgess:

Boundless Energy NE, LLC ("Boundless") is pleased to file this response to the Commission's direction in its December 16, 2014 order in these proceedings. Boundless is an independent transmission developer with significant prior transmission development experience in New York as the technical partner in the Neptune Regional Transmission System LLC's HVDC project. In this case, as in the case of the Neptune Project, Boundless focuses on innovative technical solutions using new technology. Boundless' project does not involve new right-of-way or even new structures, as Boundless proposes to use new, higher capacity conductors on existing towers to provide significantly increased transmission capability across the UPNY – SENY planning interface. This approach promises to yield a high quality, new facility with minimal environmental disturbance and significant cost savings. Boundless has identified in this filing two project revisions which appear to be required as a result of uncertainties and changes in how key system planning issues are to be handled in this case.

The Commission should be credited for taking the Energy Highway Blueprint's recommended actions and commencing a proceeding to realize them. Boundless respectfully suggests, that the Commission should encourage new entrants into the market, to introduce competition in the conception, design and construction of new transmission facilities. It is crucial to new entrants' ability to participate in this effort that the playing field be level. Incumbent utilities have significant financial advantages such that they can more easily bear the financial risks of transmission development than can non-incumbent developers.

Very truly yours,

E. John Tompkins
Chief Executive Officer

TABLE OF CONTENTS

INTRODUCTION

On December 16, 2014, the New York Public Service Commission ("Commission") directed the transmission developers in the AC Transmission Upgrades Case, Case 12-T-0502 et al. (including Case 13-T-0461) ("Upgrades Case") to make filings of specified information on January 7, 2015. This filing by Boundless Energy NE, LLC ("Boundless") responds to the Commission's order.[1] Boundless does not propose in this filing to delete or modify any of the elements of the Leeds Path West Project ("LPW Project") as filed on October 1, 2013 and updated in a filing on November 18, 2013 ("Updated Project"). Boundless does propose, however, to add two elements to the LPW Project in this filing as a potential revision to its application. Depending on how certain issues are resolved in this proceeding will control how Boundless will proceed with these potential revisions since the Commission has determined that, while it continues to seek a targeted level of congestion relief, individual projects need not provide the full 1,000 MW individually. In particular, as discussed below, how the Commission addresses the incremental transfer capability created by the TOTS projects[2] will significantly affect Boundless' application.

Boundless underscores the balance the LPW Project strikes between a provision of maximum increase in transfer capability while avoiding the need for additional rights-of-way or additional transmission infrastructure. The LPW Project maximizes environmental and system benefits for the public and rate payers, while ultimately providing a public policy benefit which meets the Commission's objectives. The LPW Project is designed and would be implemented with an accounting of all six criteria identified by the Commission for trial staff in the December 16th Order. Most important, the LPW Project goes beyond impact minimization by avoiding the acquisition of additional real estate for rights-of-way and by preserving the character that exists in the current landscape. This serves as a key distinguishing factor for the Commission in its review of the LPW Project. Moreover, it is responsive to the overwhelming submission of comments from the public and stakeholder audience. In the examination and comparison of the projects is undertaken, the LPW Project strikes a balance among all the factors in this proceeding.

This case has had a unique course which shapes this filing. Significantly, the Commission has set goals which are specific to this case, together with certain screening criteria, which have changed during the course of the proceeding. In this Introduction

---

[1] Case 12-T-0502, Alternating Current Transmission Upgrades, *Order Establishing Modified Procedures for Comparative Evaluation* 46 (issued December 16, 2014 (hereinafter the "December 16th Order").

[2] *See* discussion of the TOTS projects, including description of this short form of identification, below at Page 3.

Boundless reviews the procedural setting of the case, particularly as affected by the events over the past twelve months. In addition, Boundless identifies two particular issues which complicate the response for this filing. Finally, Boundless discusses the need, in light of these issues and the uncertainty over the Commission's goals, for Boundless to submit two project revisions, given the merits already demonstrated by the LPW Project.[3]

A. <u>Measuring Transfer Capability</u>. On February 14, 2014, the New York Independent System Operator ("NYISO") submitted its NYSPSC AC Transmission Upgrades Proceedings Screening - Level Analysis ("Screening Analysis"). The Screening Analysis, which addresses the incremental transfer capability that would be provided by each of the electric transmission projects in the Upgrades Case, surprised a number of parties. Boundless, for example, had earlier retained Siemens Power Technologies International ("Siemens PTI") to conduct incremental transfer capability studies for Boundless' proposed project. Siemens PTI's studies indicated that Boundless' LPW Project would contribute an increase of 1,232 MW of normal thermal transfer capability across the UPNY – SENY planning interface. This result was based upon data base information provided to Siemens PTI by the NYISO.

The NYISO's results for Boundless' project in the Screening Analysis – 542 MW of increased transfer capability – therefore were shocking – not merely surprising. While the NYISO's approach to calculating the increased in transfer capability has been the subject of a technical conference and various filings, what is important today is to understand how the Commission will make its assessment of transfer capability. In its December 16th Order, the Commission directed the Trial Staff to evaluate "the relative contribution to transfer capability" for the four parties' projects.[4] The Commission's Advisory Staff's Recommendations,[5] which the Commission approved in part and modified in part in the December 16th Order, called for the NYISO to conduct the "studies in accordance with the procedures and assumptions that it employs for when conducting similar investigations according to its tariff and providing advice to the Commission." While the Advisory Staff proposed that the NYISO be requested to "perform the same type of analysis as it conducted on the Statement of Intent projects and the projects

---

[3] While the Commission's regulations contain references to project alternatives, Boundless understands the term, as used in the Commission's order issued on February 21, 2014, to be more general rather than a specific reference to the Commission's regulations. Upgrades Case, *Order Authorizing Modification of the Process to Allow for Consideration of Alternative Proposals* 4.

[4] *Id.* at 38.

[5] Upgrades Case, *Advisory Staff Recommendations* 3 (issued August 13, 2014).

submitted in October 2013 . . . ."[6], the Commission did not appear to endorse this specific standard in the December 16th Order. Rather, the Commission stated that:

> . . . the Commission will direct Trial Staff to consider comments in Case 14-E-0454 and provide an overall assessment of the benefits and costs of congestion relief as a part of the Trial Staff report.[7]

These statements, Boundless respectfully submits, do not make clear what type of analysis of transfer capability increase is to be performed by the Commission. This is an important issue for Boundless.

There is more than one way to calculate increases in transfer capability. For example, since the NYISO's submission of its Screening Analysis in February 2014, it has released its Reliability Needs Assessment ("RNA").[8] The NYISO reports in the RNA that three projects (generally referred to as the "TOTS" projects) will be included in the NYISO's RNA base case for 2016.[9] The NYISO stated in the RNA that there would be an increase of transfer capability across the UPNY – SENY interface of 450 MW between 2015 and 2016, which results from the inclusion of the two TOTS projects.[10] Boundless is not aware whether the NYISO used the same approach for this calculation as it did for the Screening Analysis. In the absence of knowing which of the methods of calculating incremental transmission capability will be used will be used by the Commission in this case, Boundless is left uncertain how much is enough, and if 1,000 MW is a threshold requirement.

This is not the first time that the parties' uncertainty over how the incremental transfer capability would be measured has arisen. On February 27, 2014, the Administrative Law Judges ("Judges") in the Upgrades Case held a telephone conference call involving the parties to the case. The conference call followed an order by the Commission dated February 21, 2014 which opened the opportunity for parties to make additional project proposals. The Judges issued a ruling on March 18, 2014 reflecting on the conference call and other matters. In the ruling the Judges summarized one of three

---

[6] *Id.*

[7] December 16th Order 32.

[8] NYISO press release dated September 17, 2014 announcing the approved RNA.

[9] 2014 RNA, Page 14. While one of these three projects involves transmission upgraded affecting Staten Island and is thus not relevant to increased transfer capability across the UPNY – SENY interface, the two other TOTS projects are highly relevant to the UPNY – SENY interface, as these two projects have until recently been part of the Upgrades Case.

[10] The increase is evidenced by the difference in the representation for New York's electric system topology for 2015 and the topology for the following year, 2016 and the NYISO's explanations in working group meetings that the difference results from the addition of the TOTS projects to the 2016 representation. 2014 RNA, Appendix D.

requests made by applicants during the telephone conference call, which is pertinent to the immediate issue, as follows:

> • That they [the Applicants] be provided sufficient information to permit them to understand fully the process by which the New York Independent System Operator (NYISO) will evaluate the incremental power transfer capability of the applications; . . . .[11]

Boundless respectfully submits that this request – concerning how the transfer capability upgrade will be measured – has not been met nor explained in the Commission's subsequent order.

B. <u>TOTS Projects' Capability</u>. Another issue of importance to the parties is how the capacity represented by the TOTS projects is to be treated in this case. There is little if any dispute among the parties that the TOTS projects, having been withdrawn from the Upgrades Case, should not be evaluated, either by the Commission or by the NYISO, in this case. It is not clear, however, how the increased transfer capability produced by the TOTS projects should be treated. In the December 16th Order, the Commission stated that the TOTS projects' incremental capacity would be included in the base case for the evaluation of the incremental impact of the other applicants' projects in this case.[12]

This approach to the treatment of the TOTS projects' increased transfer capacity is not the only way that it could be considered, however. During a pretrial conference in this case, the Judges suggested that it was appropriate to consider these projects' transfer capability to remain in the analysis as if they had not yet been constructed.[13] This capacity would not, in short, be included in the base case. This position was based upon the principle of providing equity to the applicants – to avoid changing the ground rules upon which their projects had been fashioned during the course of the Upgrades Case.

Boundless is not aware of a statement by the Judges or the Commission between that conference and the December 16th order announcing how the TOTS projects' transfer capacity would be treated. While the Commission's announcement in its December 16th Order it is clear enough, it nonetheless reflects a change in the way, at least Boundless understood the projects in the Upgrades Case would be evaluated.[14]

---

[11] Judges' March 18, 2014 Ruling 1.

[12] December 16th Order 40. Each project will be measured against the base case. The details of the base case, therefore, can have significant impacts on the incremental increases of each project.

[13] Technical Conference, November 22, 2013, Transcript Page 28.

[14] Each project will be measured against the base case. The details of the base case, therefore, can have significant impacts on the incremental increases of each project.

This issue was triggered by the sponsors of the TOTS projects withdrawing the TOTS projects from this case shortly before the issuance of the Commission's December 16th Order has introduced a significant change in how Boundless understands the various projects will be evaluated.

These two issues, first, how the incremental transfer capability is to be evaluated and, second, the Commission's recent announcement concerning how the TOTS' projects' incremental transfer capability is to be treated in the analysis – have removed any clarity which may have existed earlier as to the basis for evaluating the project proposals in this case.

C. <u>Boundless' Approach in this Filing</u>. The uncertainty introduced by these two issues is made critical by the announcement by the Commission in the December 16th Order that there will be no changes in the projects following the January 7th filing. The Commission provided:

> No substantial modifications of the proposals will be allowed after the submissions due on January 7, 2015 until the comparative evaluation process is completed.[15]

This injunction by the Commission thus "freezes" the applications through the comparative process' completion as of the date of this filing. In the event that one or both of the issues identified by Boundless in this Introduction are resolved during the ensuing months in a manner adverse to Boundless, there will not be a means for Boundless to take any remedial action at that time. As a result, Boundless submits in this January 7, 2015 filing, first, the required information on its LPW Project, for which an Updated Application was filed on November 18, 2013. In addition, Boundless is providing information in this filing on two project revisions, which are necessary as revisions to Boundless' application because of the issues discussed in this Introduction.

What is new in this filing is the identification of two reconductoring applications which expand on the use of the basic impact minimization and technology-forward approach selected by Boundless in presenting this project. The details of these project revisions is described below in Section I.[16]

---

[15] December 16th order, Page 33.

[16] In addition to these two project revisions, Boundless notes that at least two additional lines which are critical to the state's electric grid are not today at the current ice-proofing standards and that the state's electric grid would benefit by the upgrading of these two lines as well as what Boundless is proposing. These two additional lines are: two circuits from New Scotland to Leeds substations and one circuit from Edic to New Scotland substation. Boundless proposes to undertake this work.

SECTION I

DESCRIPTION OF THE REVISED LPW PROJECT

The first Boundless Project submitted (Leeds Path West) was expected to provide in excess of 1,000 megawatts (MW) of increased transmission capability under a normal FERC 715 dispatch across the UPNY - SENY interface replacing existing 345 kV conductors with advanced technology conductors in an existing transmission corridor, and a new 345 kV transmission underground transmission circuit, in an existing transmission ROW, to connect clean and efficient sources of energy in upstate New York with southeastern New York. The revised project is described below.

● Reconductor the existing circuit from Leeds Substation to Hurley Avenue Substation with composite conductor cable.

● The Project would also include the installation of 40% series compensation equipment to the existing Leeds - Hurley Avenue – Roseton 345 kV lines.

● Expansion of the East Fishkill substation to tap the existing Pleasant Valley-Wood Street and Pleasant Valley-Millwood 345 kV lines with a breaker and half breaker configuration.

● Construction of two underground 345 kV lines from Roseton Substation to the Fishkill Substation. One line would connect to the Pleasant Valley-Fishkill-Wood Street 345 kV line and the other line would connect to the Pleasant Valley-Fishkill-Millwood 345 kV line.

● A 0.5% series reactor facility (two series reactors) will be installed to increase the impedance of each of the New Scotland to Leeds circuits (two circuits) by 0.005 per unit.

● Reconductor the existing 345 kV circuit from the CPV Valley Tap to the Rock Tavern Substation with composite conductor cable.

● Perform the long overdue reconductoring of the existing circuits from the Leeds Substation to the Pleasant Valley Substation with composite conductors, and upgrade existing towers with additional cross elements as necessary to meet current icing standards. This upgrade is made possible by the North-South transfer capability added to the system by the original Leeds Path West Proposal which strengthens the circuits parallel to the backbone Leeds – Pleasant Valley corridor.

SECTION II

BOUNDLESS' LEEDS PATH WEST PROJECT'S UNIQUENESS

The Leeds Path West project is unique in this case and it is a rare transmission project generally. Set forth below are a few aspects of the uniqueness of the LPW Project's and distinguishing features.

● **No environmental impact from construction**. The visual character around the existing transmission circuits will not change. The use of real estate to widen the rights-of-way will not occur. The new, composite material conductors will be, as proposed, lighter than the existing conductors, while increasing the capacity of the circuit by at least 40 percent. These conductors will not increase the visual impacts to the existing viewshed and provide an environmentally compatible project with other land features including agricultural areas, wetlands and forested habitat.

● **Higher Efficiency - Reduced Losses**. The composite conductors proposed by Boundless for use in this project have lower losses, and thus are more efficient than the existing transmission conductors. Using aluminum conductors, with better conductivity, reduces line losses at every temperature of operation. When operating at a high temperatures, the higher operating efficiency can reduce line losses and their associated emissions by 25 to 40% or more. This results in more power delivered with decreased generation costs. Moreover, the coefficient of thermal expansion of the composite conductor is as much as nine times less than a typical conductor. This virtually eliminates thermal sag and significantly improves clearances under high-load conditions, which should improve the safety performance of transmission circuits.

● **Compliance with Governor's policy of use of existing ROWs.** Governor Andrew Cuomo has called for electric transmission projects to use existing rights-of-way to better respect the communities in which the lines will be built. The LPW Project will use existing rights-of-way.

● **Use of existing circuits**. The New York Energy Highway Initiative called for the expansion of the electrical transmission grid to use and rehabilitate the state's aging infrastructure of high voltage transmission facilities. Boundless adopted this sound public policy goal as a design criterion in its planning of the LPW Project. This valuable application of public policy is not in accord with the utility industry's age-old practice of building new, ever larger transmission lines. Nor is it in accord with how the utility industry, including the NYISO, evaluates the reliability of new transmission lines. Reliability tests, generally, are conducted by assuming that a flaw – or outage – has occurred in the system. Sometimes, the tests are conducted based on the assumption that first one

and then a second flaw or outage has occurred. This N-1-1 test, however, has an inherent bias favoring new transmission circuits.

● **Expandability**. Traditionally-designed transmission upgrades have a fixed expansion cap, based upon the maximum size of the conductors and the towers. In the case of Boundless LPW Project, however, the conductor size propose for use is not the maximum size available. During the licensing period, as a result, if decisions makers decide to value higher capacity more (against selection of a lower cost conductor) that change can be made with a major redesign of the project or the need to add an additional circuit.

● **Storm Hardening**. The changing climate is leading utility regulators to require electric utilities to take steps to improve the hardiness of the electric grid against dangerous storm events. While rising sea levels and increased flooding from rain events and storm surges has received much attention, it is also important in a state such as New York, where sub-freezing temperatures in the winter are frequent, to strengthen electric lines against ice storms. Few in the electric industry have forgotten about the severe ice storm which occurred in Quebec in 1998. This storm led to major system-wide failures of the province's high voltage electric grid which caused Montreal and other major cities to be blacked-out in winter for a number of days. In New York, some electric lines meet current national engineering standards, while other lines have been "grandfathered" so that they do not have to be replaced with new lines. Boundless LPW Project will, for the circuit miles it addresses, upgrade the conductors to the current engineering requirements. Safety and reliability of operation will be improved. The essential design concept employed by Boundless could at, the lowest cost available, increase the hardiness of New York's high voltage electric grid by replacing the conductors with composite conductors.

● **Overall Benefit of LPW Project**. In addition to the advantages of the LPW Project noted above, it is important to consider its benefit to system planning. In eastern New York, there is a major electric transmission corridor crossing the Hudson River at the Leeds substation and continuing on the east side of the Hudson River into Westchester County and into New York City. In the central part of the state, the Marcy South circuit, coupled with an upgrade south of the Rock Tavern substation, constitutes a major electric transmission corridor comparable to the corridor on the eastern side of the Hudson River.

Boundless is proposing to make two major changes to the electric grid. The circuits on the west side of the Hudson would be strengthened by the substitution of modern conductors. In addition, the cross-Hudson tie from Roseton substation to East Fishkill substation will create a cross-connection between the reinforced west side

corridor and the existing east side corridor. Such linkage, a "rung" in a ladder, will increase operators' flexibility in the event of failures of circuits at some point in the future.

Coupled with these basic system improvements, various project revisions could be added, with the goal of increasing transfer capability further. Boundless has identified what it believes are the most valuable project revisions, which are described in Section I(B) above. Other, add-on reconductoring projects are also available as well.

SECTION III

MODELING DATA FOR THE EXISTING LPW PROJECT PLUS FOR EACH PROJECT REVISION

AC Transmission

Boundless' consultants are working on providing this information in the format required and Boundless expects to provide it promptly. The unexpected delay results from the needed interaction of two different consultants. In addition, Boundless includes information on the conductors for the two project revisions in the figures set forth below. The first pair of figures shows the comparison between the current conductors used on the Leeds – Pleasant Valley circuits and advanced composite conductors, while the comparison shown in the second pair of figures is applicable to the CPV Valley to Rock Tavern circuit.

Technical Comparison
ACSR Drake vs ACCC Drake

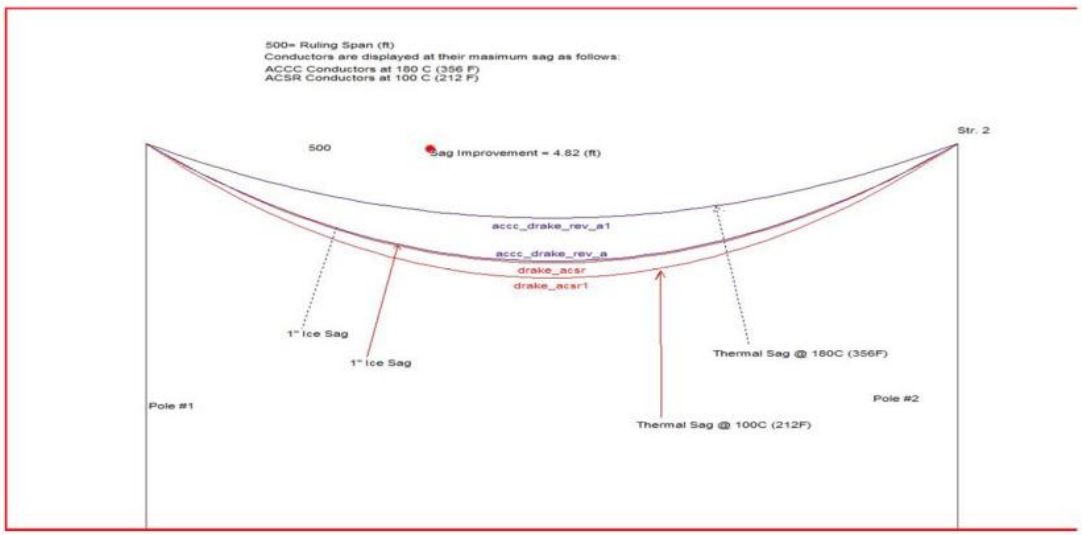
Conductor Name			ACSR Drake		ACCC Drake		Notes
Area of Aluminum		kcmil	795		1025.6		
Maximum DC Resistance (@ 20deg C)		ohm/kft	0.0214		0.0163		
Overall Diameter of Conductor		in.	1.108		1.108		
Mass of Conductor per 1000ft		lb	1094		1051.8		
Rated Tensile Strength of Conductor		lbf	31,500		41,200		
Maximum Working Current / Resistance @ 75°C		A - ohm/mile	1910	0.1390	2182	0.1065	
Maximum Working Current / Resistance @ 100°C		A - ohm/mile	2311	0.1502	2639	0.1152	
Maximum Working Current / Resistance @ 150°C		A - ohm/mile	-	-	3303	0.1325	Note1
Maximum Working Current / Resistance @ 180°C		A - ohm/mile	-	-	3618	0.1428	Note2
Condutors per Bundle			2		2		
Number of Circuits			2		2		
Conductor Temperature at 2311 A		°C	100		81		
First Year Line Losses for 39.3 miles line @ 2311 A		MWh	432,096		312,686		
First Year Line Losses for 39.3 miles line @ 2311 A based on $80 MWh			$34,567,680		$25,014,880		
First Year Line Losses Savings based on $80 MWh			-		$9,552,800		
First Year Line Losses Savings by		%	-		28%		
Sag of Conductor		500 ft Span	Sag	Total Tension	Sag	Total Tension	
1	NESC Heavy	ft-lbs	7.64	10261	7.00	11025	
2	1 inche of an ice (extreme ice)	ft-lbs	9.62	12069	9.52	12067	
3	21 psf wind (extreme wind)	ft-lbs	8.63	8063	8.01	8610	
4	0C	ft-lbs	5.23	6542	4.57	7192	
5	15°C (60°F)	ft-lbs	6.34	5393	5.63	5836	Note3
6	90°C(194°F)	ft-lbs	10.44	3277	5.81	5661	
7	100°C(212°F)	ft-lbs	10.78	3172	5.83	5638	
9	150°C (302°F)	ft-lbs	-	-	5.89	5577	
10	180°C (356°F)	ft-lbs	-	-	5.96	5519	

Note 1 Environmental conditons assumed: Ambient temp: 20°C, Wind 2 ft/sec, Sun Radiation 97.08 Watt/ft², Elevation 100 ft; Solar Absorotivity and Emissivity 0.5. Ampacity/Temperature calculated using IEEE 738.

Note 2 With ACCC Drake current capacity will increase up to 3,600 amps from ACSR Drake's 2,000 amps.

Note 3 Designed a Max tension of 1210 lbs. of ACSR Drake was applied under initial 1' ice (extreme ice conditions) and is used for all conductors.

PLS-CADD Result

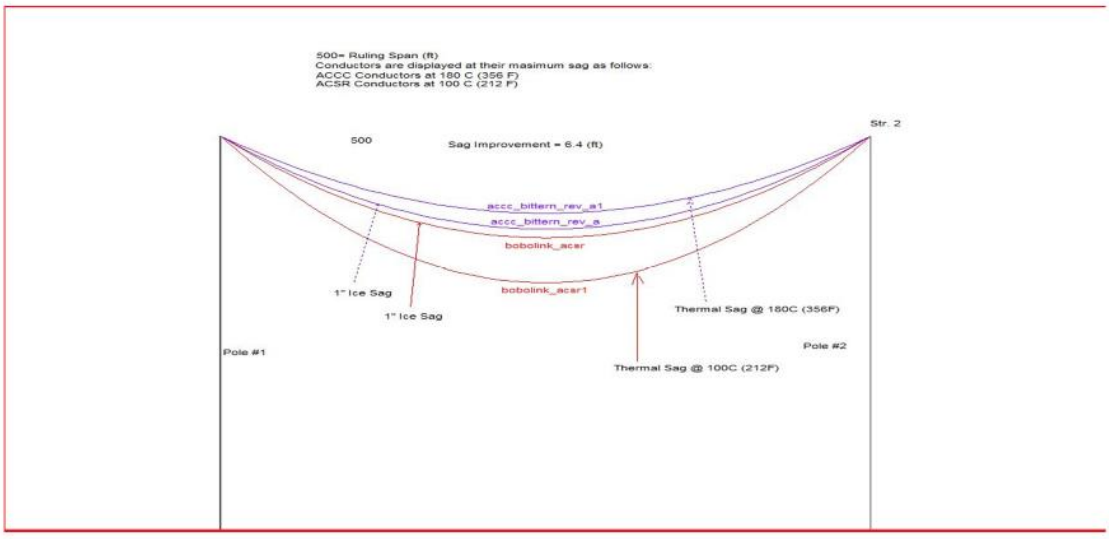


Technical Comparison
ACSR Bobolink vs ACCC Bittern

Conductor Name			ACSR Bobolink		ACCC Bittern		Notes
Area of Aluminum		kcmil	1431		1581.6		
Maximum DC Resistance (@ 20deg C)		ohm/kft	0.0120		0.0107		
Overall Diameter of Conductor		in.	1.427		1.345		
Mass of Conductor per 1000ft		lb	1613		1566.3		
Rated Tensile Strength of Conductor		lbf	38,300		39,400		
Maximum Working Current / Resistance @ 75°C		A - ohm/mile	2681	0.0808	2807	0.0738	
Maximum Working Current / Resistance @ 100°C		A - ohm/mile	3261	0.0871	3412	0.0795	
Maximum Working Current / Resistance @ 150°C		A - ohm/mile	-	-	4301	0.0910	
Maximum Working Current / Resistance @ 180°C		A - ohm/mile	-	-	4725	0.0978	Note1 Note2
Condutors per Bundle			2		2		
Number of Circuits			2		2		
Conductor Temperature at 3621 A		°C	100		93		
First Year Line Losses for 46.6 miles line @ 3261 A		MWh	591,836		512,202		
First Year Line Losses for 46.6 miles line @ 3261 A based on $80 MWh			$47,346,880		$40,976,160		
First Year Line Losses Savings based on $80 MWh			-		$6,370,720		
First Year Line Losses Savings by		%	-		10%		
Sag of Conductor		500 ft Span	Sag	Total Tension	Sag	Total Tension	
1	NESC Heavy	ft-lbs	7.74	13020	6.69	14602	
2	1" ice (extreme ice)	ft-lbs	9.47	15295	9.16	15296	
3	21 psf wind (extreme wind)	ft-lbs	9.20	10105	7.94	11131	
4	0C	ft-lbs	6.15	8194	4.90	9987	
5	15°C (60°F)	ft-lbs	7.50	6727	6.10	8028	Note3
6	90°C(194°F)	ft-lbs	13.34	3782	7.41	6604	
7	100°C(212°F)	ft-lbs	14.00	3603	7.43	6586	
8	150°C (302°F)	ft-lbs	-	-	7.54	6497	
9	180°C (356°F)	ft-lbs	-	-	7.60	6444	

Note 1 Environmental conditions assumed: ambient temp. 10 degrees, wind 2 ft/sec, sun radiation 97.08 Watt/ft^2, elevation 100 ft; solar absorotivity and emissivity 0.5. Ampacity/temperature calculated using IEEE 738.

PLS CADD Result



Series Compensation

Boundless does not propose to change anything regarding the information furnished in the Update Application, except that the facility at Coopers Corners is not within Boundless scope as it is now being constructed by the New York Power Authority.

Transformers

Not applicable.

Substations

Boundless does not propose to establish any new substations.

As to modified substations (e.g., new line connecting to existing substation), we have provided this information under confidentiality protection to the NYISO previously in connection with the pending Feasibility Study. Boundless will provide the information again if requested. Recent information received from manufacturers on gas insulated substations indicates that the size and losses of substations, particularly the East Fishkill Substation, can be reduced by adoption of this technology. Typical results show gas insulated substations will be between 4 to 15 times more reliable than Air Insulated substations with a lower total life cycle cost. This reduces the footprint and improves the aesthetics.

SECTION IV

DEVELOPER QUALIFICATIONS AND TIMING

A. Current and Expected Financial Resources of Boundless

Boundless has secured development financing from two entities, CorEnergy Infrastructure Trust. In addition, Boundless continues to negotiate with other entities to secure future development funding.

CorEnergy Infrastructure Trust has expressed an interest, as a condition of providing its development funding, of providing the equity funding for the Leeds Path West project. Moreover, over the past decade, Boundless has worked with a number of other financial firms which specialize in investments in transmission and power generation projects, including Energy Capital Partners, Energy Investors Funds, plus other firms, and has typically used Societé General as an investment banker. In addition,

Boundless has entered into an agreement with Tag Energy Partners, LLC to advise Boundless on financing issues and to assist Boundless in securing the necessary funding for the LPW Project.

Boundless seeks authority from the Commission and the NYISO for the Leeds Path West Project. In the event that such authority is provided, Boundless will seek, in cooperation with the NYISO, appropriate rate orders from the Federal Energy Regulatory Commission ("FERC") for recovery of investment and a return on investment. This project, in short, will be a regulated project.

No audited annual financial statements nor credit ratings exist for Boundless. Boundless has not declared bankruptcy, nor had a material default, dissolution or significant merger transaction.

B. Technical Expertise of Boundless Regarding the Proposed Project

Boundless is an experienced transmission development company, with a number of seasoned development professionals. Boundless' principals include registered professional engineers. Boundless projects are in operation and in development worldwide. See: www.JDFCable.com, www.NeptuneRTS.com and www.TRMC.com.

Boundless has licensed a number of projects in the past. In the recent past in New York, key Boundless professionals were involved in the Neptune Regional Transmission Project. The Neptune Project provides up to 660 MW of electric power from the PJM system to the LIPA grid on Long Island via a 500-kilovolt (kV), direct current (DC) cable. The two converter stations enable the Project to take alternating current (AC) power from the PJM system and convert it to DC power and, on Long Island, convert DC power back to AC for use on the LIPA system. The DC cable runs approximately 50 miles under the Raritan River in New Jersey and the Atlantic Ocean, and an additional 15 miles buried alongside the Wantagh Parkway.

Additionally, Boundless' professionals have been involved in the licensing of a number of other transmission and power generation projects in some cases while associated with Boundless and in other cases during other periods of employment. Boundless has retained Ecology and Environment, Inc. to provide assistance in environmental permitting.

Boundless, as noted above, has entered into an agreement with Miller Brothers. As a part of that agreement, Miller Brothers will serve as Boundless' engineer in connection with the licensing, construction and commissioning of the LPW Project. In addition, Boundless may retain other experienced construction managers to oversee the turnkey construction of EPC contracts for these the LPW Project. The turnkey EPC construction method could be used to contract with the investor owned utilities for construction

management when the use of turnkey EPC contracts minimizes the financial risks to ratepayers and taxpayers.

Boundless expects to contract with the incumbent utility for each segment of the LPW Project which is proposed in this case. The incumbent utility will maintain an interest in the portion of the capacity of the new project conductors equal to the current capacity of the existing facilities, and can be expected to seek to continue operation of the project conductors. While the NYISO will control the operation of the lines for many purposes, it is expected that the incumbent utility will, as a matter of providing safe and reliable service to its customers seek to continue control over the operation of the project conductors. In the event that satisfactory arrangements with such utilities cannot be realized, Boundless will turn to one or more of a number of companies which operate and maintain transmission facilities, which are known to Boundless. Boundless will contract with one or more such companies to provide operational control and to maintain the project facilities. In addition, Boundless expects that the NYISO will exercise overall operational control of the LPW Project.

Boundless projects that involved rights of way acquisition, include the Westbrook Generation Facility and the Neptune Transmission project. Acquired rights for these projects included those for generators, HVDC converters, new electrical transmission, and access to gas pipelines.

Boundless has already submitted its qualifications to the NYISO and been approved to submit a reliability project. In 2012, Boundless submitted an application to the NYISO in connection with the NYISO's 2012 Comprehensive Reliability Plan solicitation. As a part of that submission as an alternative regulated solution, Boundless submitted its qualifications for undertaking the proposed project. While the NYISO solicited additional technical information from Boundless about that project, it did not solicit additional information about Boundless' submission of its qualifications. Boundless' submission of entity and project qualifications were sufficient for the NYISO to include Boundless' submission in the 2012 Comprehensive Reliability Plan.[17]

The NYISO's current Open Access Transmission Tariff, Section 31.2.4.1.1.3 provides, among other matters, that a transmission developer shall retain its qualification status for three years following the date of the original approval. While Boundless understands that this tariff provision was submitted to the FERC on October 15, 2013 and that at the time of Boundless' participation in the NYISO's 2012 Comprehensive Reliability Plan process a number of the current tariff provisions did not exist, Boundless

[17] The NYISO indicated that only a high level review of the proposal had been conducted as there were sufficient market-based projects to preempt Boundless' alternative regulated project under the NYISO's tariff provisions.

suggests that the approval of its qualification in the 2012 Comprehensive Reliability Plan should now be considered by the NYISO in its evaluation of Boundless' qualifications.

C. Experience Needed to Develop, Construct, and Operate a Transmission Project

Boundless was incorporated in 1996 as a developer of non-utility transmission and generation projects. Boundless was the original developer of the Neptune Regional Transmission System's high voltage DC cable connecting PJM with Long Island, having conceived and pursued the concept of multiple northeast submarine HVDC interconnections in 1997 before joining with the other partners in 2000 to form Atlantic Energy Partners, the ultimate developer. Boundless is one of the Neptune Project's shareholders as a limited partner.

An early Boundless project was a 550 MW combined cycle gas turbine in the City of Westbrook that required innovative electrical and gas interconnections. Despite competition from several other similar projects in the same area, the Westbrook project prevailed and went on line in 2001.

Since independent merchant transmission development won regulatory approval, most of Boundless' work has been in the area of merchant HVDC electric cable projects, for which it has served both as the originator and technical designer of interconnection concepts that go beyond "extension cords" to incorporate significant network reliability, stability and enhanced capacity.

For the Neptune Project, Boundless originated the concept of the New Jersey to Long Island interconnection, performed initial project siting and interconnection evaluations and undertook the initial marine routing environmental analysis. Most significantly, Boundless devised the innovative interconnection concept at the LIPA Newbridge Road substation that obviated LIPA's prior interconnection capacity limitations. Boundless also performed the initial project scoping work with the NYISO and PJM and final interconnection analysis that interconnected the Neptune Project with very low interconnection costs.

In concert with Sea Breeze Power Corporation, Boundless has developed the international Juan De Fuca Cable Project, a 550 MW HVDC submarine cable and converter system linking Port Angeles, Washington and Victoria, British Columbia. This project has attained all principal international permits, including a U.S. Presidential Permit, completed environmental impact statement, a Canadian National Energy Board Certificate of Convenience and Necessity and Environmental Clearance, U.S. Army Corps of Engineers combined water quality/wetlands permits and all British Columbia and Washington State governmental permits/approvals. The project is "shovel ready," and was initially accepted into Department of Energy's Phase 2 (Innovative Projects) loan guarantee application process. The JDF project is currently in negotiations with regional

utilities on an innovative revenue sharing concept for the new transmission service without an increase to existing customers.

Other current projects being developed by Boundless and Sea Breeze include West Coast Cable, a 1600 MW DC cable project between Oregon and California and an interconnecting cable project from Northwest British Columbia, both under path rating review by the regional reliability agency, WECC. Individually, the principals of Boundless have decades of project development, financing, permitting and management experience including New England HVDC and AC transmission and biomass energy plants.

Boundless has been a force for innovative interconnections and the early application of world class best available technology for twenty years. A small group of engineers with decades of utility and EPRI experience, the group understands the regulatory environment and culture of the modern American utility. It is focused on addressing the seams of service territories and regions in a comprehensive way that benefits the systems being connected on multiple levels.

Boundless seeks to find high value gaps and specific needs of existing systems that may be leveraged into superior load serving systems by the application of creative thinking and thorough understanding of the systems and their operational needs. The much acclaimed Neptune Project, the one large HVDC undertaking in North America that finished on time and within its $660 million budget, is the prime example. Boundless respects the requirements of the investor owned utilities as well as the role of the large public utilities. It considers the generation and distribution functions, and how they can all best be aided by an innovative, technically-based transmission owner working under the FERC mandates, as it seeks select specific opportunities for its expertise to help build the system that will best serve the nation in the 21st Century

SECTION V

PROJECT INFORMATION REQUIREMENTS

(A) Contact Information

E. John Tompkins
Chief Executive Officer
203 Redstone Hill
Plainville, CT 06062
(860) 747 0497
ejt@trmc.com

(B) The Lead Time Necessary to Complete the Project

Eleven months following the NYISO selection of the project.

(C) A Description of the Project

At the time of Boundless' application for the Updated Project, the LPW Project was expected to provide in excess of 1,000 megawatts (MW) of increased transmission capability across the UPNY - SENY interface using new 345 - kilovolt (kV) conductors in an existing transmission corridor and a new 345 - kV transmission line adjacent to an existing transmission line to connect clean and efficient sources of energy in upstate New York with southeastern New York. The Updated Project is described below.

Boundless proposes to reconductor an existing 345 - kV line and to construct two new 345 – kV transmission lines in Greene, Ulster, Dutchess, and Orange counties. Reconductoring would be done on existing H - frame structures of the existing line between the Leeds substation and the Hurley Avenue substation. The sections of new transmission line between the Roseton substation and the east bank of the Hudson River and between the east bank of the Hudson River and East Fishkill are expected to be installed underground. These Lines would cross under the Hudson River using horizontal directional drilling (HDD) between Orange and Dutchess counties. It is expected that the lines would then continue underground to the East Fishkill Substation. The Project would also include switching stations, new and expanded substations, and the installation of 40% series compensation equipment on the existing transmission line between the Hurley Avenue substation and the Roseton substation.

Applicant's proposed project is also based on a second installation of series compensation. Boundless's application assumes that NYPA will complete and install this facility. This TOTS project has, moreover, been added to the base case for other applicants.

Section 1 of the Updated Project would use 345 – kV aluminum conductor composite core (ACCC) or aluminum conductor composite reinforced (ACCR) composite conductors in place of the existing conductors to achieve substantially higher capacity. This section runs from Leeds to the Hurley Avenue substation.

The Updated Project will include new 40% series compensation equipment on the existing transmission line between the Hurley Avenue substation and the Roseton substation. No other physical changes would be made to this section. From the Roseton substation the Updated Project will consist of two new 345 - kV lines running under the Hudson River to the east bank of the river in Dutchess County. The Hudson River crossing would be made using HDD.

The final segment of the Updated Project is expected to consist of two new underground 345 – kV lines from the east bank of the Hudson River east to an expanded East Fishkill substation in Dutchess County. The lines would connect with the two existing 345 - kV circuits which are not presently interrupted at East Fishkill, by expanding the existing substation.

(D) Evidence of a Commercially Viable Technology

The overhead AC 345 kV composite power cable technology used for most of the circuit miles for the Leeds Path West Project is standard, widely used electric industry technology. The underground AC 345 kV power cable, used for the Hudson River crossing is similarly widely used electric industry technology. Both types of cables are available in the United States from multiple suppliers. A number of United States electrical utilities have adopted the reconductoring approach proposed by Boundless.

Similarly, the technology used for horizontal directional drilling under the Hudson River has been used worldwide in both the electrical and gas pipeline industries. In all instances the equipment and technologies involved are broadly available from multiple manufacturers.

(E) A Major Milestone Schedule

A major milestone schedule for Boundless' Leeds Path West project is attached as Appendix A.

(F) A Schedule for Obtaining Any Required Permits and Other Certifications

See major milestone schedule under Subsection E.

(G) Evidence of Site Control, or a Plan for Obtaining Site Control

The majority of the project site will consist of the circuit miles of existing 345 KV transmission line, together with associated substations. This property is today owned by incumbent utilities. The issue of Boundless' ability to gain access to the site necessary for it to construct its project was raised in this case by the Department of Public Service Staff in the form of a letter, dated November 1, 2013, asserting deficiencies in Boundless' application. The Staff assertion of a deficiency assumed that Boundless' project required the consent of the incumbent utility owners. Boundless responded by asserting that it will incorporate under the New York Transportation Corporations Law and that it could take the necessary property rights by eminent domain in the event agreement with the incumbent utility was not reached.

On December 20, 2013, the Administrative Law Judges in this case ruled on the Staff assertion. Among other determinations, the Judges noted: "Then, with a certificate of public convenience and necessity issued by the Commission in hand, it will have the authority to acquire the property of Central Hudson by eminent domain."[18] And, further with respect to Boundless' power to take the property interests it needs, the Judges stated:

> Whether or not the details of such an arrangement can be worked out without causing material interference with Central Hudson's use of its right-of-way is a factual inquiry that can be addressed as this proceeding continues. At present, we have no grounds to find that Boundless's proposal is infeasible as a matter of law.
>
> Boundless has described a legally plausible path for implementing its proposed project.[19]

The full ruling is available on the docket for Case 13-T-0461 maintained by the Commission.

It is significant that the Federal Energy Regulatory Commission ("FERC"), in its Order 1000, has stated that transmission providers cannot maintain a right of first refusal, and thus refuse to cooperate with non-incumbent developers on new projects. Moreover, in a decision pertinent to the current situation, FERC ruled that the Consolidated Edison Company of New York could not refuse to make an existing bay in a major Manhattan switchyard available to a transmission developer on the claim that the utility might need it at some time in the future. *Consolidated Edison Company of New York, Inc.*, 101 FERC ¶ 61,185, Order Accepting For Filing, With Modifications, Proposed Interconnection Agreement (Issued November 20, 2002). On the basis of these facts, Boundless submits that it has a viable plan for obtaining Site Control.

(H) Status of any Contracts (other than an Interconnection Agreement) That Are Under Negotiation or in Place

As noted above, Boundless is in discussions with firms to provide additional financial support for the Leeds Path West Project. Moreover, one or more electric utilities may well seek to participate in financing Boundless' projects. It is premature, however, to commit fully to a financing entity until the acceptance of proposed projects has been determined. The determination of financial structure and the source of the financing is best made after the project it is accepted. It is similarly premature to commit to a utility owning the ROW for Boundless' projects until they have been accepted. In addition,

[18] Judges' Ruling, issued December 20, 2013, P. 3
[19] *Id.* at PP. 5 – 6.

Boundless is in discussions with several of the equipment suppliers over the terms by which they will supply the needed equipment for the project.

(I) Status of any Interconnection Studies and an Interconnection Agreement

Boundless filed an interconnection request on November 26, 2013 with the NYISO. The NYISO continues to conduct the Feasibility Study pursuant to that interconnection request.

(J) The Status of Equipment Availability and Procurement

Boundless has not commenced equipment procurement. It is completely infeasible and irresponsible to purchase conductors, for example, prior to being awarded the necessary regulatory authority by the State of New York and FERC to permit the project to move forward. Nevertheless, Boundless has discussed the equipment which will be required for the Leeds Path West project with the following equipment suppliers, among others:

CTC Global
ABB
Prysmian
Nexans

Boundless has received project price estimates from equipment suppliers and installers. Boundless will require suppliers to include full warranties which requires the details of the project to be established.

(K) Evidence of Financing or Ability to Finance the Project

Please refer to the discussion above in Section IV(A) for information concerning evidence of financing or ability to finance the project.

(L) Capital Cost Estimate

The capital cost estimate for the Leeds Path West project, as originally proposed plus the two additional components identified in this filing, is $650,000,000. The Leeds Path West project, as proposed in this filing, includes the two components Boundless considers to be necessary in light of the requirements suggested by the Commission, NYISO and as well as other New York State stakeholders.

It is possible to reduce the total cost of the project by more than $200 million by eliminating the two additional components identified in this filing, namely the Leeds – Pleasant Valley, and Leeds – Athens – Pleasant Valley reconductoring components. However, bringing these critical circuits up to current icing standards and

increasing the capacity of total energy flow into the SENY area is long overdue by nearly 20 years and, in the opinion of Boundless, would be imprudent to eliminate.

(M) Description of Permitting or Other Risks Facing the Project at the Stage of Project Development, Including the Reasonableness of Project Cost Estimates

Boundless has retained Ecology & Environment, Inc., a consulting firm expert in licensing matters. Ecology & Environment has reported to Boundless that they do not see any significant barriers to a prompt licensing of the LPW Project. This project, which is largely on the right of way of one investor-owned utility and one public authority, should not present significant licensing issues. The LPW Project serves to preserve the character that exists in the current landscape and therefore increases the environmental compatibility of this project. The basic activity – reconductoring – is a very often-undertaken maintenance activity in the electric utility business and can be performed with minimal or no impacts.

(N) Any Other Information Requested by the NYISO

The NYISO has not made any request to Boundless for additional information. In the event that such a request is made in the future, Boundless will promptly respond.

This January 7, 2015 filing, made in response to the Commission's order, is respectfully submitted.

Boundless Energy, NE, LLC

E. John Tompkins

Chief Executive Officer

Appendix A

Major Milestone List

Update Application Information	1 - 2015
DPS Trial Staff Report and Motion re Ranking	6 - 2015
Commence Prep. of Appl'n. for Art. VII Proc.	6 – 2015
PSC Decision on LPW Project Ranking	9 - 2015
NYISO Solicits Solutions	9 - 2015
NYISO Commences Review of Solutions	12 – 2015
File Appl'n. for Article VII Proceeding	12 – 2015
NYISO Determines Review of Solutions	3 – 2016
Rate Filing at FERC	4 – 2016
Completion of Ind. Article VII Proceeding	12 – 2016
File EM&CP Materials	12 – 2016
Completion of EM&CP	3 – 2017
Commence Construction	4 – 2017
Complete Construction	9 – 2017
COD	12 - 2017