Western New York Public Policy Transmission Need Viability & Sufficiency Assessment

A report from the New York Independent System Operator

Draft
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Table of Contents

Executive Summary

The New York Independent System Operator (NYISO) is implementing for the first time its Public Policy Transmission Planning Process, the new component of the overall Comprehensive System Planning Process. The Public Policy Transmission Planning Process supports the Federal Energy Regulatory Commission (FERC) Order No. 1000 directive requiring public utility transmission providers to consider in their planning processes transmission needs driven by Public Policy Requirements. The NYISO conducted this Viability and Sufficiency Assessment for the Western New York Public Policy Transmission Need to determine whether each Developer-submitted proposal is complete, viable, and sufficient to satisfy the public policy.

The NYISO initiated its first Public Policy Transmission Planning Process by soliciting proposed transmission needs that stakeholders or interested parties believe are driven by Public Policy Requirements. The NYISO filed for consideration by the New York Public Service Commission (NYPSC) the proposed transmission needs and the NYPSC published the proposed needs for comments. Upon considering the various comments submitted, the NYPSC issued an order that found "significant environmental, economic, and reliability benefits could be achieved by relieving the transmission congestion identified in Western New York" and therefore adopted the Western New York Public Policy Transmission Need.

The NYISO established sufficiency criteria in accordance with the criteria set forth by the NYPSC order, and developed baseline models and associated power flow results to aid interested parties in developing project proposals. The transmission security analysis of the baseline system conditions identified overloads on the Niagara to Gardenville 230 kV and 115 kV transmission corridors primarily as a result of the contingency loss of one, two, or three 230 kV transmission lines. These overloads are aggravated for increased levels of Ontario imports. These results confirm that there is insufficient transmission capability out of the Niagara area.

The NYISO issued a solicitation for solutions to address the Western New York Public Policy Transmission Need and received 15 proposals from eight developers. The NYISO conducted a comparable transmission security analysis of each project in the same manner as the baseline analysis. In general, each project addresses at least some portion of the baseline transmission security issues, but not all projects addressed all of the bulk power transmission security issues. Out of the 15 proposed projects, the NYISO identifies seven viable and sufficient projects to address the Western New York Public Policy Transmission Need and recommends certain non-bulk transmission upgrades also be made to fulfill the objectives of the transmission need identified by the PSC.

As the next step in the process, the NYPSC will review this Viability and Sufficiency Assessment and will issue an order explaining whether the NYISO should continue to evaluate and rank the viable and sufficient transmission solutions as part of the Public Policy Transmission Planning Report.

1. Introduction

The NYISO's planning process, known as the Comprehensive System Planning Process (CSPP), is comprised of four components: (1) the Local Transmission Owner Planning Process, (2) the Reliability Planning Process, (3) the Economic Planning Process, and (4) the Public Policy Transmission Planning Process (PPTPP). The NYISO also conducts interregional planning with its neighboring control areas under the Northeast Coordinated System Planning Protocol. The PPTPP supports the FERC Order No. 1000 directive requiring public utility transmission providers to consider in their planning processes transmission needs driven by Public Policy Requirements (Public Policy Transmission Needs). Section 31.4 of Attachment Y of the NYISO Open Access Transmission Tariff (OATT, or the Tariff) describes the planning process that the NYISO, and all interested parties, shall follow to consider Public Policy Requirements[1] that drive the need for expansions or upgrades to Bulk Power Transmission Facilities (BPTFs).[2] Pursuant to the Tariff, the NYISO conducted this Viability and Sufficiency Assessment for the Western New York Public Policy Transmission Need to determine whether each Developer-submitted proposal is complete, viable, and sufficient to satisfy the Public Policy Transmission Need.

The PPTPP consists of four main steps: (1) the identification of Public Policy Transmission Needs, (2) the proposal of solutions to identified Public Policy Transmission Needs, (3) the evaluation of the viability and sufficiency of proposed transmission and non-transmission solutions to a Public Policy Transmission Need, and (4) upon confirmation of the transmission need by the NYPSC, the evaluation and selection of the more efficient or cost effective Public Policy Transmission Project to satisfy a Public Policy Transmission Need.

For each two-year CSPP cycle, the NYISO initiates the first step of the PPTPP after the draft Reliability Needs Assessment (RNA) results are released in the Reliability Planning Process. In the identification step, the NYISO solicits proposals for transmission needs driven by Public Policy Requirements, and the NYPSC or Long Island Power Authority (LIPA) considers the proposals in order to identify the Public Policy Transmission Needs and determines for which of those the NYISO should solicit solutions. Subsequent to the identification of Public Policy Transmission Needs, the NYISO solicits proposed solutions, and Developers submit Public Policy Transmission Projects and Other Public Policy Projects to satisfy the identified Public Policy Transmission Needs. All submissions, regardless of project type, are evaluated for their viability and sufficiency to meet the Public Policy Transmission Needs.

[1] A Public Policy Requirement is a federal or New York State statute or regulation, including a New York State Public Service Commission (NYPSC) order adopting a rule or regulation subject to and in accordance with the State Administrative Procedure Act, any successor statute, or any duly enacted law or regulation passed by a local governmental entity in New York State, that may relate to transmission planning on the BPTFs.

[2] The BPTFs include all of the facilities designated by the NYISO as a Bulk Power System (BPS) element as defined by the NYSRC and NPCC, as well as other transmission facilities that are relevant to planning the New York State transmission system. The current BPTF list is provided in Appendix B of the 2014 NYISO Area Transmission Review, posted at: http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Reliability-Compliance/2014%20ATR%20non-ceii%20Appendix.zip

A Public Policy Transmission Project is a transmission project or a portfolio of transmission projects proposed by Developer(s) to satisfy an identified Public Policy Transmission Need and for which the Developer(s) seek to be selected by the NYISO for purposes of allocating and recovering the project's costs under the NYISO OATT.

An Other Public Policy Project is a non-transmission project or a portfolio of transmission and non-transmission projects proposed by a Developer to satisfy an identified Public Policy Transmission Need. An Other Public Policy Project may consist of transmission, generation, and/or demand-side projects.

Following the NYISO's presentation of the Viability and Sufficiency Assessment, the NYPSC will review the Viability and Sufficiency Assessment and will issue an order explaining whether there continues to be a transmission need driven by a Public Policy Requirement and, if so, that the NYISO should continue to evaluate transmission solutions to a Public Policy Transmission Need.[3] If the NYPSC concludes that non-transmission solutions should be pursued, the NYPSC will indicate in its order that there is no longer a transmission need driven by a Public Policy Requirement that requires the NYISO's evaluation of potential transmission solutions. In such case, the NYISO would not perform an evaluation, or make a selection of, a more efficient or cost-effective transmission solution for that planning cycle.

Upon a confirmation by the NYPSC that a need for a transmission solution still exists, the NYISO evaluates the proposed Public Policy Transmission Projects that have satisfied the viability and sufficiency requirements and ranks them based on the quality of their satisfaction of numerous metrics. Based on this evaluation, the NYISO may select the more efficient or cost effective Public Policy Transmission Project to satisfy the Public Policy Transmission Need(s). A selected project is eligible for cost allocation and recovery under the NYISO OATT. The assumptions, inputs, methodologies, and results of the NYISO's analysis are published in the Public Policy Transmission Planning Report.

2. Summary of the Public Policy Transmission Need

On August 1, 2014, the NYISO initiated its first Public Policy Transmission Planning Process by soliciting proposed transmission needs that stakeholders or interested parties believe are driven by Public Policy Requirements. On October 3, 2014, the NYISO filed for consideration by the NYPSC the proposed transmission needs it received from eight entities. On November 12, 2014, the NYPSC published the proposed needs in the State Register in accordance with the State Administrative Procedure Act for comments. Following its receipt and review of comments, the NYPSC sought supplemental comments on April 3, 2015, relating specifically to transmission capability in Western New York. Upon considering the

[3] The focus of the NYPSC's review is upon whether there continues to be a need for transmission. Comments regarding the technical merits of this Viability and Sufficiency Assessment should be directed to the NYISO through its stakeholder process.

various comments submitted, the NYPSC issued an order on July 20, 2015 ("NYPSC Order")[4] that found "significant environmental, economic, and reliability benefits could be achieved by relieving the transmission congestion identified in Western New York"[5] and therefore adopted a Public Policy Requirement concerning transmission congestion in Western New York.[6] The NYPSC referred the Western New York Public Policy Transmission Need to the NYISO for the solicitation and evaluation of potential solutions.[7] The NYPSC Order directed the NYISO:

> to consider solutions for increasing Western New York transmission capability sufficient to ensure the full output from New York Power Authority's Niagara hydroelectric generating facility (i.e., 2,700 MW including Lewiston Pumped Storage), as well as certain levels of simultaneous imports from Ontario across the Niagara tie lines (i.e., maximize Ontario imports under normal operating conditions and a least 1,000 MW under emergency operating conditions). This increased capability should maximize transfers out of Load Zone A and into the rest of the State.
>
> The NYISO's analysis should ensure no transmission security violations, thermal, voltage or stability, would result under normal and emergency operating conditions. The analysis should also ensure the system would be maintained in a reliable manner with fossil-fueled generation in Western New York out-of-service, as well as in-service. The NYISO shall also consider other metrics in its evaluation of this Public Policy Requirement, including: changes in production costs; Load-Based Marginal Prices; transmission losses; emissions; Installed Capacity costs; Transmission Congestion Contract revenues: transmission congestion; impacts on transfer limits; and resource deliverability.[8]

2.1. Sufficiency Criteria

The NYISO established sufficiency criteria in accordance with the criteria set forth by the NYPSC Order, and developed baseline models and associated power flow results to aid interested parties in developing project proposals. The NYISO made presentations at combined meetings of the Transmission Planning Advisory Subcommittee and Electric System Planning Work Group on July 30, 2015, August 27, 2015, and October 29, 2015 to review the NYPSC's determination of a Public Policy Requirement, the nature of the resulting Western New York Public Policy Transmission Need, and the associated models and assumptions to be used in NYISO's evaluations.[9]

[4] NYPSC Case No. 14-E-0454 – In the Matter of New York Independent System Operator, Inc.'s Proposed Public Policy Transmission Needs for Consideration, *Order Addressing Public Policy Requirements for Transmission Planning Process* (July 20, 2015).
[5] *Id.* at p. 27.
[6] *Id.* at p. 28.
[7] *Id.* at p. 33.
[8] *Id.* at 27-28.
[9] The NYISO's presentations are posted on its website under meeting materials at the following link: http://www.nyiso.com/public/markets_operations/committees/meeting_materials/index.jsp?com=bic_espwg.

In order to achieve the environmental, economic, and reliability benefits associated with the Public Policy Requirement as identified by the NYPSC, a sufficient Public Policy Transmission Project or Other Public Policy Project shall obtain full output from Niagara and Lewiston plants while maintaining certain levels of simultaneous imports from Ontario and while meeting applicable North American Electric Reliability Corporation (NERC), Northeast Power Coordinating Council (NPCC) and New York State Reliability Council (NYSRC) reliability criteria, and local Transmission Owner planning criteria. Appendix A provides the details of the sufficiency criteria that the NYISO applied to establish baseline results and to determine the sufficiency of each proposed Public Policy Transmission Project and Other Public Policy Project to satisfy the Western New York Public Policy Transmission Need.

2.2. Sufficiency Assessment Methodology

The process for developing the study cases for the Viability and Sufficiency Assessment is described in Section 4 of the NYISO Public Policy Transmission Planning Process Manual. Based on the sufficiency criteria set forth by the NYPSC Order, the NYISO determined that a power flow model is the most applicable to evaluate the Western New York Public Policy Transmission Need. The baseline and project study cases are based on the NYISO 2014 Comprehensive Reliability Plan[10] base case system representation of 2024 summer peak load, with the following modifications:

- Niagara and Lewiston at full output of 2,700 MW, represented by two dispatch scenarios:
    - Dispatch 1
        a. Niagara 230 kV units (8-13) at full output total = 1,320 MW
        b. Niagara 115 kV units (1-7) dispatch total = 1,140 MW
        c. Lewiston Pumped Storage total = 240 MW
    - Dispatch 2
        a. Niagara 230 kV units (8-13) dispatch total = 920 MW
        b. Niagara 115 kV units (1-7) at full output total = 1,540 MW
        c. Lewiston Pumped Storage total = 240 MW
- Ontario Import to Zone A initially scheduled at 1,000 MW, allowed to reduce for conditions other than N-1 Emergency Transfer Criteria
- Huntley and Dunkirk generation plants out-of-service
- National Grid Local Transmission Plan (LTP) updates in Zone A:
    - Bypassable 1.532% series reactors on the Packard – Huntley 230 kV lines #77 and #78
    - Two 100 MVAr shunt capacitor banks at Huntley 230 kV station

The NYISO utilized these modified cases to conduct transmission security analysis of the Western New York system. Transmission security is the ability of the power system to withstand disturbances such as short circuits or unanticipated loss of system elements and continue to supply and deliver electricity. Security is assessed deterministically, with potential disturbances being

[10] The NYISO 2014 Comprehensive Reliability Plan is posted at: http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Reliability_Planning_Studies/Reliability_Assessment_Documents/2014CRP_Final_20150721.pdf

applied without concern for the likelihood of the disturbance in the assessment. These disturbances (single-element and multiple-element contingencies) are categorized as the design criteria contingencies, explicitly defined in the NYSRC Reliability Rules. The impacts when applying these design criteria contingencies are assessed to ensure no thermal loading, voltage or stability violations will occur.

The NYISO conducted transmission security analysis of the BPTFs and non-BPTFs (115 kV and above) in accordance with applicable NERC Reliability Standards, NPCC Transmission Design Criteria, NYSRC Reliability Rules, and local Transmission Owner planning criteria. AC contingency analysis is performed to evaluate thermal and voltage performance under design contingency conditions using the Siemens PTI PSS®E and PowerGEM TARA programs. Generation is dispatched to match load plus system losses, while respecting transmission security, subject to the sufficiency criteria constraints described in Appendix A. Scheduled inter-area transfers modeled in the base case between the New York Control Area (NYCA) and neighboring systems are held constant, with the exception of Ontario imports.

To evaluate the impact of a single event from the normal system condition (N-1), all design criteria contingencies are evaluated including: single element, common structure, stuck breaker, generator, bus, and HVDC facilities contingencies. An N-1 violation occurs when the power flow on the monitored facility is greater than the applicable post-contingency rating. N-1-0 and N-1-1 analysis evaluates the ability of the system to meet design criteria after a critical element has already been lost. The process of N-1-0 and N-1-1 testing allows for corrective actions including generator redispatch, phase angle regulator (PAR) adjustments, and HVDC adjustments between the first and second contingency. These corrective actions prepare the system for the next contingency by reducing the flow to normal rating after the first contingency. An N-1-0 violation occurs when the flow cannot be reduced to below the normal rating following the first contingency. An N-1-1 violation occurs when the facility loading is reduced to below the normal rating following the first contingency, but the power flow following the second contingency is greater than the applicable post-contingency rating.

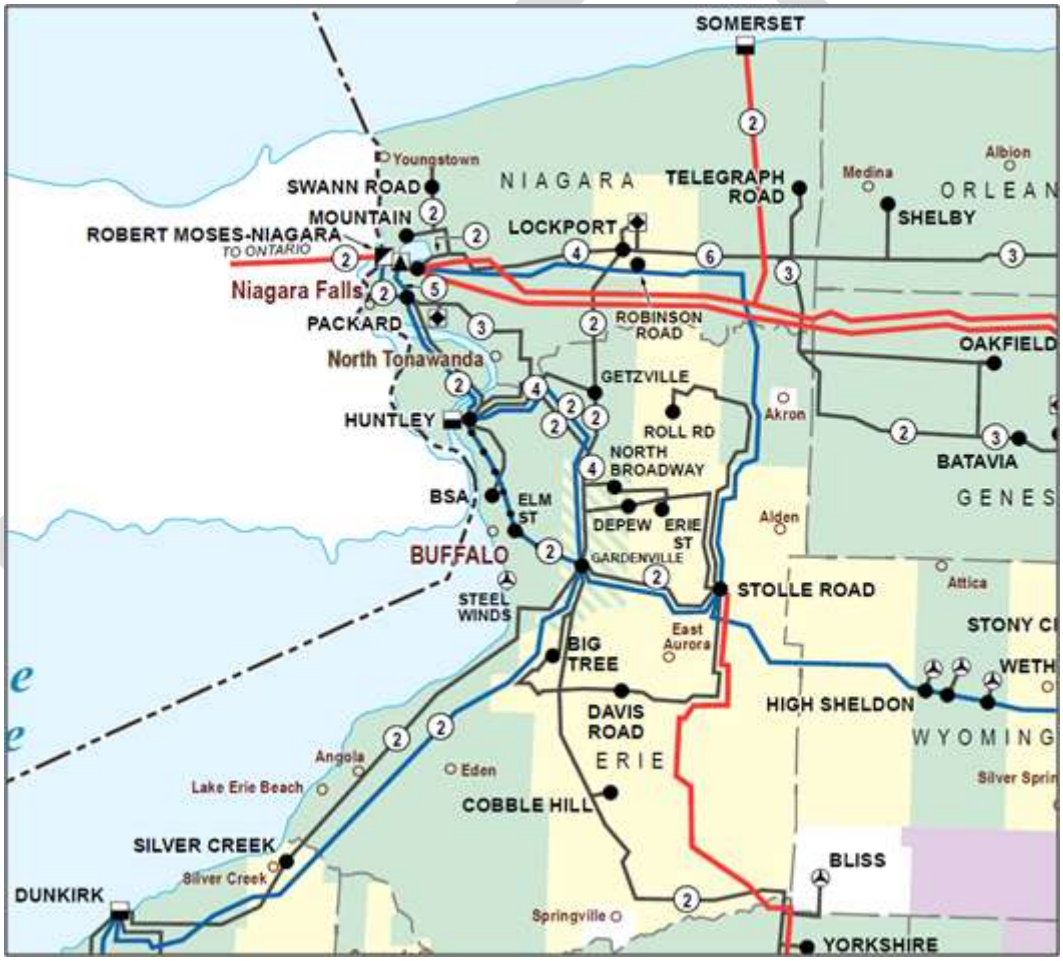
2.3. Baseline Results

The 230 kV system between Niagara and Gardenville includes two parallel 230 kV transmission lines from Niagara to Packard to Huntley to Gardenville, including a number of taps to serve load in the Buffalo area. A third parallel 230 kV transmission line also runs from Niagara to Robinson Rd. to Stolle Rd. to Gardenville. A 115 kV network also parallels the 230 kV network between Niagara and Gardenville. The transmission security analysis of the baseline system conditions identified overloads on these 230 kV and 115 kV transmission corridors primarily as a result of the contingency loss of one, two, or three 230 kV transmission lines. These overloads are aggravated for increased

levels of Ontario imports. These results confirm that there is insufficient transmission capability out of the Niagara area.

Figure 1 depicts the transmission system in Western New York. Table 1 and Table 2 list the overloaded transmission lines that were identified in the baseline and the maximum loading observed for the various categories of conditions evaluated, including emergency transfer criteria (ETC) and normal transfer criteria (NTC). Table 1 reports the line loadings observed when the Packard 230 kV #77 and #78 series reactors are bypassed and Table 2 reports the line loadings observed when the series reactors are in-service. Appendix B provides greater detail regarding the nature of the overloads.[11, 12]

Figure 1: Western New York Transmission Map



[11] The full results with the Packard series reactors bypassed are posted at: http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Public_Policy_Documents/Western_NY/Western_NY_PPTN_Baseline_Results_2015-10-27_SR-bypassed.xls

[12] The full results with the Packard series reactors in-service are posted at: http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Public_Policy_Documents/Western_NY/Western_NY_PPTN_Baseline_Results_2015-10-27_SR-in.xls

Table 1: Summary of Baseline Results with Packard Series Reactors Bypassed

Monitored Facility	Dispatch 1 (230 kV)				Dispatch 2 (115 kV)				Max
	ETC		NTC		ETC		NTC		
	N-1	N-1-1	N-1	N-1-1	N-1	N-1-1	N-1	N-1-1	
130762 GARDV230 230 130767 STOLE230 230 1		108%	112%	122%		103%	108%	123%	123%
130795 DEPEW115 115 130799 ERIE 115 115 1			101%				101%		101%
130847 ROLL 115 115 130857 STOLE115 115 1			103%				103%		103%
135303 SAWYER77 230 135414 HUNTLEY2 230 1	101%			103%					103%
135303 SAWYER77 230 135415 PACKARD2 230 1	117%	110%	108%	114%	111%	104%	102%	107%	117%
135304 SAWYER78 230 135414 HUNTLEY2 230 2	100%			104%					104%
135304 SAWYER78 230 135415 PACKARD2 230 2	110%	110%	108%	116%	105%	104%	102%	108%	116%
135415 PACKARD2 230 147842 NIAGAR2W 230 1		108%		108%					108%
135415 PACKARD2 230 147842 NIAGAR2W 230 2		108%	103%	108%					108%
135449 GR.I-182 115 135459 NI.B-182 115 1							101%		101%
135450 GRDNVL1 115 135453 LONG-180 115 1			101%				108%		108%
135458 NI.B-181 115 135460 PACK(N)E 115 1			114%				119%		119%
135460 PACK(N)E 115 135538 LONG-182 115 1							104%		104%
135460 PACK(N)E 115 147850 NIAG115E 115 2							111%		111%
135461 PACK(S)W 115 147851 NIAG115W 115 3			101%				121%		121%
135497 ZRMN-133 115 135562 S214-133 115 1								100%	100%
147850 NIAG115E 115 147842 NIAGAR2W 230 1				100%					100%

Table 2: Summary of Baseline Results with Packard Series Reactors In-Service

Monitored Facility	Dispatch 1 (230 kV)				Dispatch 2 (115 kV)				Max
	ETC		NTC		ETC		NTC		
	N-1	N-1-1	N-1	N-1-1	N-1	N-1-1	N-1	N-1-1	
130762 GARDV230 230 130767 STOLE230 230 1		111%	112%	121%		107%	107%	118%	121%
130795 DEPEW115 115 130799 ERIE 115 115 1		122%		118%		122%		118%	122%
130815 HINMN115 115 131611 HARIS115 115 1		100%							100%
130847 ROLL 115 115 130857 STOLE115 115 1			103%				103%		103%
135303 SAWYER77 230 135414 HUNTLEY2 230 1				100%					100%
135327 AM.S-54 115 135450 GRDNVL1 115 1		107%		107%		107%		108%	108%
135415 PACKARD2 230 147842 NIAGAR2W 230 1				100%					100%
135415 PACKARD2 230 147842 NIAGAR2W 230 2				101%					101%
135449 GR.I-182 115 135459 NI.B-182 115 1							101%		101%
135451 HUNTLEY1 115 135498 ZRMN-130 115 1						100%	102%	100%	102%
135451 HUNTLEY1 115 135562 S214-133 115 1							100%		100%
135452 LOCKPORT 115 135876 TELRDTP1 115 1						100%			100%
135454 MLPN-129 115 135461 PACK(S)W 115 1								100%	100%
135455 MLPN-130 115 135461 PACK(S)W 115 1						101%		101%	101%
135458 NI.B-181 115 135460 PACK(N)E 115 1		104%	112%			112%	122%	102%	122%
135460 PACK(N)E 115 135538 LONG-182 115 1							106%		106%
135460 PACK(N)E 115 147850 NIAG115E 115 2							112%		112%
135461 PACK(S)W 115 147851 NIAG115W 115 1		117%		109%		137%		135%	137%
135461 PACK(S)W 115 147851 NIAG115W 115 2		117%		109%		137%		135%	137%
135461 PACK(S)W 115 147851 NIAG115W 115 3		107%	103%	102%		127%	123%	125%	127%
135467 SHAW-103 115 135470 SWAN-103 115 1						101%			101%
135497 ZRMN-133 115 135562 S214-133 115 1						100%	101%	100%	101%
147850 NIAG115E 115 147842 NIAGAR2W 230 1		100%		123%				100%	123%

3. Proposed Projects and Findings

On November 1, 2015, the NYISO issued a solicitation for Public Policy Transmission Projects and Other Public Policy Projects to address the Western New York Public Policy Transmission Need. Project proposals were due on or before December 31, 2015.[13] Following issuance of the solicitation letter, the NYISO received numerous clarifying questions from interested Developers. The NYISO summarized the questions and provided responses in a public Frequently Asked Questions (FAQ) document first posted on December 3, 2015, and updated on December 15, 2015.[14]

The NYISO received 12 Public Policy Transmission Projects and three Other Public Policy Projects. Subsequent to receipt of the project proposals, the NYISO requested additional project information from Developers to address missing information or to clarify the submitted information. The Developers of one Public Policy Transmission Project and two Other Public Policy Projects failed to submit a complete response within the timeframe provided by the Tariff; therefore, in accordance with Section 31.4.4.3 of the OATT, those three projects are not eligible for further consideration during this planning cycle.

In accordance with Section 31.4.15 of the NYISO OATT, the NYISO maintains the confidentiality of each proposed solution except for certain basic information until the NYISO determines that the proposed solution is viable and sufficient and the Developer consents to the NYISO's inclusion of its proposed solution in the Public Policy Transmission Planning Report. Table 3 provides the publicly available information for each of the proposed projects.

Table 3: Proposed Projects

Developer	Project Name	Category	Queue Position	Type	Location County/State	Size (MW)
NRG Dunkirk Power	Dunkirk Gas Addition	OPPP	523, 524	ST	Chautauqua, NY	435
North America Transmission	Proposal 1	PPTP	N/A	AC	Niagara-Erie, Wyoming, NY	N/A
North America Transmission	Proposal 2	PPTP	N/A	AC	Niagara-Erie, Wyoming, NY	N/A
North America Transmission	Proposal 3	PPTP	N/A	AC	Niagara-Erie, Wyoming, NY	N/A
North America Transmission	Proposal 4	PPTP	N/A	AC	Niagara-Erie, Wyoming, NY	N/A
ITC New York Development	15NYPP1-1 Western NY AC	PPTP	N/A	AC	Niagara-Erie, NY	N/A
National Grid	Moderate Power Transfer Solution	PPTP	528	AC	Niagara-Erie, NY	N/A
National Grid	High Power Transfer Solution	PPTP	529	AC	Niagara-Erie, NY	N/A
NYPA/NYSEG	Western NY Energy Link	PPTP	432, 525	AC	Niagara-Erie, Wyoming, NY	N/A
NextEra Energy Transmission New York	Empire State Line Proposal 1	PPTP	530	AC	Niagara-Erie, NY	N/A
NextEra Energy Transmission New York	Empire State Line Proposal 2	PPTP	530	AC	Niagara-Erie, NY	N/A
Exelon Transmission Company	Niagara Area Transmission Expansion	PPTP	N/A	AC	Niagara-Erie, NY	N/A

OPPP: Other Public Policy Project
PPTP: Public Policy Transmission Project
ST: Steam Turbine
AC: Alternating Current Transmission

[13] The Western New York Public Policy Transmission Need Project Solicitation is posted at: http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Public_Policy_Documents/Public_Policy_Notices/Western_NY_PPTN_Solution_Solicitation_Letter_2015-11-01.pdf

[14] The Western New York Public Policy Transmission Need FAQ document is posted at: http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Public_Policy_Documents/Western_NY/Western_NY_PPTN_FAQ_2015-12-15.pdf

The NYISO conducted a comparable transmission security analysis of each project in the same manner as the baseline analysis. The objective of this analysis is to identify any remaining transmission security issues following the addition of each project to the baseline case. The NYISO did not calculate the incremental Ontario import capability for each project as part of the viability and sufficiency assessment; that analysis will be part of the evaluation and selection phase of the process. In general, each project addresses at least some portion of the baseline transmission security issues, but not all projects addressed all of the BPTF transmission security issues. Table 4 lists the BPTF and non-BPTF findings for each proposed solution. Detailed results have been provided individually to each Developer.

Table 4: Project Findings

Developer	Project Name	BPTF Issues Resolved?	Non-BPTF Issues Resolved?	Sufficient?
NRG Dunkirk Power	Dunkirk Gas Addition	No	No	No
North America Transmission	Proposal 1	No	No	No
North America Transmission	Proposal 2	No	No	No
North America Transmission	Proposal 3	Yes	No	Yes
North America Transmission	Proposal 4	Yes	No	Yes
ITC New York Development	15NYPP1-1 Western NY AC	No	No	No
National Grid	Moderate Power Transfer Solution	No	No	No
National Grid	High Power Transfer Solution	Yes	No	Yes
NYPA/NYSEG	Western NY Energy Link	Yes	No	Yes
NextEra Energy Transmission New York	Empire State Line Proposal 1	Yes	No	Yes
NextEra Energy Transmission New York	Empire State Line Proposal 2	Yes	No	Yes
Exelon Transmission Company	Niagara Area Transmission Expansion	Yes	No	Yes

The projects that did not address the BPTF transmission security issues are not sufficient to meet the Western New York Public Policy Transmission Need. The non-BPTF transmission security issues that remain are common among many, if not all, of the sufficient proposed projects. The full capability of each project to unbottle Niagara generation and Ontario imports may not be realized if these non-BPTF issues are left unaddressed. Table 5 lists the overloaded non-BPTF transmission lines that remain for the sufficient projects and the maximum percent loading observed for the various categories of conditions evaluated.

Table 5: Remaining Non-BPTF Overloads

Monitored Facility	Line ID	Dispatch 1 (230 kV)				Dispatch 2 (115 kV)			
		ETC		NTC		ETC		NTC	
		N-1	N-1-1	N-1	N-1-1	N-1	N-1-1	N-1	N-1-1
130795 DEPEW115 115 130799 ERIE 115 115 1	921		108%		108%		108%		108%
135327 AM.S-54 115 135450 GRDNVL1 115 1	54		101%		104%				101%
135460 PACK(N)E 115 147850 NIAG115E 115 2	192							106%	
135461 PACK(S)W 115 147851 NIAG115W 115 1	193		102%		102%		122%		122%
135461 PACK(S)W 115 147851 NIAG115W 115 2	194		102%		102%		122%		122%

The Niagara – Packard 115 kV transmission corridor currently consists of five parallel 115 kV transmission lines (#191, #192, #193, #194, #195) each approximately 3.5 miles long. The analysis finds three of these lines can limit Niagara and Ontario output under certain contingency and outage conditions. The Niagara – Packard 115 kV #192 line poses a constraint under N-1 conditions when securing for the tower contingency loss of the parallel #191 line and a second Niagara-exit transmission line. The analysis indicates a short term emergency (STE) rating overload of up to 106% at a flow of 348 MVA.

The Niagara – Packard 115 kV #193 and #194 lines would also constrain Niagara and Ontario output under N-1-1 conditions when one of the #193, #194, or #195 lines is out of service followed by securing for loss of a second line. The analysis indicates an STE rating overload of up to 122% at a flow of 428 MVA.

The Gardenville – Depew – Erie St. 115 kV #54/#921 line represents one of three sources to the Erie St. 115 kV substation on the eastern outskirts of the Buffalo metropolitan area. The line may be overloaded under high transfer conditions when one of the other Erie St. sources is out of service. These issues would be addressed by replacing terminal equipment at Gardenville and Erie St. 115 kV stations to achieve a normal rating of at least 135 MVA.

4. Conclusions and Recommendations

The NYISO performed a comparable analysis of each proposed Public Policy Transmission Planning Project and Other Public Policy Project to confirm that the proposed solution independently satisfies the Western New York Public Policy Transmission Need to increase transfer capability on the BPTFs. The NYISO determined that the following projects meet the sufficiency criteria:

- North America Transmission – Proposal #3
- North America Transmission – Proposal #4
- National Grid – High Power Transfer Solution
- NYPA/NYSEG – Western NY Energy Link
- NextEra Energy Transmission New York – Empire State Line #1
- NextEra Energy Transmission New York – Empire State Line #2
- Exelon Transmission Company – Niagara Area Transmission Expansion

For each sufficient project, the Developer of the project is qualified, the solution is technically practicable, and the Developer has an approach for acquiring any necessary rights-of-way, property, and facilities. Therefore, each sufficient project is also viable.

To realize the full capability of the viable and sufficient projects and fulfill the objectives of the Western New York Public Policy Transmission Need, the NYISO recommends that any remaining non-BPTF issues also be addressed by the more efficient or cost effective Public Policy Transmission Project that is ultimately selected. Specifically, the NYISO recommends reconductoring of the Niagara – Packard 115 kV #192, #193, and #194 lines and replacement of limiting terminal equipment for lines #54 and #921 at the Gardenville and Erie St. 115 kV stations to the extent necessary to address remaining non-BPTF issues for the specific selected project.

5. Next Steps

Following the NYISO's presentation of these findings to the Electric System Planning Working Group (ESPWG) and Transmission Planning Advisory Subcommittee (TPAS) and issuance of the final version of the Viability and Sufficiency Assessment, the NYISO will submit the Viability and Sufficiency Assessment to the NYPSC for its review. It is expected that the NYPSC will issue an order, in accordance with the State Administrative Procedure Act, explaining whether there continues to be a transmission need driven by a Public Policy Requirement and, if so, that the NYISO should continue to evaluate transmission solutions to the Western New York Public Policy Transmission Need.

In addition, within 30 Calendar Days of the NYISO's presentation to ESPWG and TPAS, the Developer of a proposed Public Policy Transmission Project that the NYISO has determined is viable and sufficient must notify the NYISO whether it intends for its project to proceed to be evaluated for purposes of the NYISO's selection of the more efficient or cost-effective Public Policy Transmission Project to satisfy the Western New York Public Policy Transmission Need. As part of this notification, the Developer must include its consent to the NYISO's disclosure of the details of its proposed Public Policy Transmission Project in the Western New York Public Policy Transmission Planning Report.

If the NYPSC concludes that transmission solutions should continue to be pursued to address the Western New York Public Policy Transmission Need, the NYISO will evaluate the viable and sufficient Public Policy Transmission Projects that have elected to proceed for purposes of selecting the more efficient or cost-effective Public Policy Transmission Project. The NYISO will rank these Public Policy Transmission Projects based on their satisfaction of the metrics set forth in the Tariff and in the NYPSC Order and document its findings in the Western New York Public Policy Transmission Planning Report.

Appendix A – Study Cases and Sufficiency Criteria

Western NY Public Policy Transmission Need

Study Cases and Sufficiency Criteria

Study Cases

The baseline and project study cases for the Western NY Public Policy Transmission Need (PPTN) will be based on the NYISO 2014 Comprehensive Reliability Plan base case system representation of 2024 summer peak load, with the following modifications:

- Niagara and Lewiston at full output of 2,700 MW, represented by two dispatch scenarios:
    - Dispatch 1
        a. Niagara 230 kV units (8-13) at full output total = 1,320 MW
        b. Niagara 115 kV units (1-7) dispatch total = 1,140 MW
        c. Lewiston Pumped Storage total = 240 MW
    - Dispatch 2
        a. Niagara 230 kV units (8-13) dispatch total = 920 MW
        b. Niagara 115 kV units (1-7) at full output total = 1,540 MW
        c. Lewiston Pumped Storage total = 240 MW
- Ontario Import to Zone A scheduled at 1,000 MW
- Huntley and Dunkirk generation plants out-of-service
- National Grid Local Transmission Plan (LTP) updates in Zone A:
    - Bypassable 1.532% series reactors on the Packard – Huntley 230 kV lines #77 and #78
    - Two 100 MVAr shunt capacitor banks at Huntley 230 kV station

Sufficiency Criteria (Minimum Criteria)

In order to achieve the environmental, economic, and reliability benefits associated with the Public Policy Requirement as identified by the NYPSC, a sufficient Public Policy Transmission Project or Other Public Policy Project shall obtain full output from Niagara and Lewiston (both Dispatch 1 and Dispatch 2) while maintaining certain levels of simultaneous imports from Ontario and while meeting applicable North American Electric Reliability Corporation (NERC), Northeast Power Coordinating Council (NPCC) and New York State Reliability Council (NYSRC) reliability criteria, and local Transmission Owner planning criteria. Specifically:

- Emergency Transfer Criteria (ETC)
    - Per NYSRC, pre-contingency loading must not exceed normal ratings and post-contingency loading must not exceed short term emergency (STE) ratings for single element contingencies (e.g., loss of a transmission line, transformer, or generating unit). This will be applied to all facilities 115 kV and above.
    - N-1: Ontario import to Zone A of 1,000 MW must be maintained to secure 115 kV and above facilities to STE ratings for single element contingencies.
    - N-1-0 & N-1-1: Following the first contingency loss of a single element, Ontario Import may be reduced to no less than zero and generation, other than Niagara, may be redispatched to return the system to normal ratings (N-1-0) and to secure to STE ratings for single element contingency conditions (N-1-1).

- Normal Transfer Criteria (NTC)
    - Per NYSRC, pre-contingency loading must not exceed normal ratings and post-contingency loading must not exceed long term emergency (LTE) ratings for all design contingencies (e.g., loss of a transmission line, a transformer, a generating unit, two adjacent circuits on a common tower, or multiple circuits that share a common breaker), subject to NYSRC Reliability Rule Exceptions. This also applies following the loss of a critical transmission line, transformer, or generating unit (N-1-1), which will be applied to all facilities 230 kV and above.
    - Per local Transmission Owner planning criteria, 115 kV facilities shall be designed to meet NYSRC Normal Transfer Criteria for first contingency conditions (N-1), and shall be designed to meet NYSRC Emergency Transfer Criteria following the first contingency (N-1-0 & N-1-1).
    - N-1: Ontario import may be reduced to no less than zero to secure facilities 115 kV and above to LTE ratings for all design contingencies.
    - N-1-0 & N-1-1 for 230 kV and above facilities: Following the first contingency loss of a single element, Ontario may be reduced to no less than zero and generation, other than Niagara, may be redispatched to return the system to normal ratings (N-1-0) and to secure to LTE ratings for all design contingency conditions (N-1-1).
    - N-1-0 & N-1-1 for 115 kV facilities: Following the first contingency loss of a single element, Ontario may be reduced to no less than zero and generation, other than Niagara, may be redispatched to return the system to normal ratings (N-1-0) and to secure to STE ratings for single element contingency conditions (N-1-1).

PPTN-specific Project Information and Metrics

A Public Policy Transmission Project or Other Public Policy Project may meet the sufficiency criteria with the Packard – Huntley 230 kV series reactors in-service or bypassed. **For each Public Policy Transmission Project and Other Public Policy Project, the Developer must declare the desired status (in-service or bypassed) of the series reactors as part of the submission of project information.**

For purposes of evaluating the "Cost per MW" metric in the evaluation of Public Policy Transmission Projects, the NYISO will use the incremental Ontario Import capability (MW) that results from each Public Policy Transmission Project.

Baseline Study Results and Cases

Baseline study results are publicly available on the NYISO website at:

http://www.nyiso.com/public/markets_operations/services/planning/planning_studies/index.jsp

The baseline study cases are available, subject to a Critical Energy Infrastructure Information (CEII) request:

http://www.nyiso.com/public/webdocs/markets_operations/services/customer_relations/CEII_Request_Form/CEII_Request_Form_and_NDA_complete.pdf

Appendix B – Baseline Results

Baseline Results with Packard Series Reactors Bypassed

Monitored Facility	First Contingency	Second Contingency	Dispatch 1 (230 kV)				Dispatch 2 (115 kV)				Max
			ETC		NTC		ETC		NTC		
			N-1	N-1-1	N-1	N-1-1	N-1	N-1-1	N-1	N-1-1	
130762 GARDV230 230 130767 STOLE230 230 1	HUNTLEY - PACKARD 77 230	B:PACKT3		108%				103%			108%
	R:HC-SR_37&W-F_171	T:77&78				122%				123%	123%
	T:77&78	N/A			112%				108%		112%
130795 DEPEW115 115 130799 ERIE 115 115 1	SB:PK115 30+40	N/A			101%				101%		101%
130847 ROLL 115 115 130857 STOLE115 115 1	SB:181:ER	N/A			103%				103%		103%
135303 SAWYER77 230 135414 HUNTLEY2 230 1	B:PACKT3	N/A	101%								101%
	HUNTLEY - PACKARD 78 230	STOLLRD - GARDENVILL 66 230				103%					103%
135303 SAWYER77 230 135415 PACKARD2 230 1	B:PACKT3	N/A	117%								117%
	HUNTLEY - PACKARD 78 230	Base Case		110%		109%		104%		101%	110%
		STOLLRD - GARDENVILL 66 230				114%				107%	114%
	S:PA_HNTL78	N/A			108%		111%		102%		111%
	STOLLRD - GARDENVILL 66 230	S:PA_HNTL78		106%							106%
135304 SAWYER78 230 135414 HUNTLEY2 230 2	HUNTLEY - PACKARD 77 230	STOLLRD - GARDENVILL 66 230				104%					104%
	OE:PACK_77	N/A	100%								100%
135304 SAWYER78 230 135415 PACKARD2 230 2	HUNTLEY - PACKARD 77 230	Base Case		110%		110%		104%		102%	110%
		STOLLRD - GARDENVILL 66 230				116%					116%
	NIAGARA - ROBINSON 64 230	HUNTLEY - PACKARD 77 230								108%	108%
	S:PA_HNTL77	N/A	110%		108%		105%		102%		110%
135415 PACKARD2 230 147842 NIAGAR2W 230 1	NIAGARA - PACKARD 62 230	Base Case		108%		108%					108%
	NIAGARA - ROBINSON 64 230	T:62&BP76				100%					100%
135415 PACKARD2 230 147842 NIAGAR2W 230 2	NIAG - NEWROCH 1 345	T:61&64				100%					100%
	NIAGARA - PACKARD 61 230	Base Case		108%		108%					108%
	T:61&64	N/A			103%						103%
135449 GR.I-182 115 135459 NI.B-182 115 1	DCT:230:77+78+THR	N/A							101%		101%
135450 GRDNVL1 115 135453 LONG-180 115 1	DCT:230:77+78+THR	N/A			101%				108%		108%
135458 NI.B-181 115 135460 PACK(N)E 115 1	T:77&78	N/A			114%				119%		119%
135460 PACK(N)E 115 135538 LONG-182 115 1	DCT:230:77+78	N/A							104%		104%
135460 PACK(N)E 115 147850 NIAG115E 115 2	DCT:115:101+191	N/A							111%		111%
135461 PACK(S)W 115 147851 NIAG115W 115 3	DCT:115:193+194	N/A			101%				121%		121%
135497 ZRMN-133 115 135562 S214-133 115 1	PACKARD 230/115 4TR	NIAGARA 230/115 2TR								100%	100%
147850 NIAG115E 115 147842 NIAGAR2W 230 1	NIAGARA - PACKARD 61 230	SB:PA230_R506				100%					100%

Baseline Results with Packard Series Reactors In-Service

Monitored Facility	First Contingency	Second Contingency	Dispatch 1 (230 kV)				Dispatch 2 (115 kV)				Max
			ETC		NTC		ETC		NTC		
			N-1	N-1-1	N-1	N-1-1	N-1	N-1-1	N-1	N-1-1	
130762 GARDV230 230 130767 STOLE230 230 1	DCT:230:77+78+THR	N/A			112%				107%		112%
	HUNTLEY - PACKARD 77 230	HUNTLEY - PACKARD 78 230		111%				107%			111%
	LN:115:180	T:77&78				121%					121%
	WTHRS - MEYER 230	T:77&78								118%	118%
130795 DEPEW115 115 130799 ERIE 115 115 1	First:Lancaster_926B	LN:115:181/922				118%				118%	118%
	LN:115:705 NY	LN:115:181/922		122%				122%			122%
130815 HINMN115 115 131611 HARIS115 115 1	SOMERSET - NEWROCH 1 345	NIAG - NEWROCH 1 345		100%							100%
130847 ROLL 115 115 130857 STOLE115 115 1	SB:181:ER	N/A			103%				103%		103%
135303 SAWYER77 230 135414 HUNTLEY2 230 1	HUNTLEY - PACKARD 78 230	B:STOLE230				100%					100%
135327 AM.S-54 115 135450 GRDNVL1 115 1	LN:115:181/922	Base Case		107%		107%		107%		108%	108%
135415 PACKARD2 230 147842 NIAGAR2W 230 1	LN:115:192	T:62&BP76				100%					100%
135415 PACKARD2 230 147842 NIAGAR2W 230 2	NIAGARA 230/115 1TR	T:61&64				101%					101%
135449 GR.I-182 115 135459 NI.B-182 115 1	DCT:230:77+78	N/A							101%		101%
135451 HUNTLEY1 115 135498 ZRMN-130 115 1	NF:115:133 HT	N/A							102%		102%
	NIAGARA 230/115 2TR	LN:115:133						100%		100%	100%
135451 HUNTLEY1 115 135562 S214-133 115 1	SB:130:PK	N/A							100%		100%
135452 LOCKPORT 115 135876 TELRDTP1 115 1	SOMERSET - NEWROCH 1 345	NIAG - NEWROCH 1 345						100%			100%
135454 MLPN-129 115 135461 PACK(S)W 115 1	LN:115:130	Base Case								100%	100%
	NIAGARA 230/115 2TR	LN:115:130								100%	100%
135455 MLPN-130 115 135461 PACK(S)W 115 1	NIAGARA 230/115 2TR	LN:115:129						101%		101%	101%
135458 NI.B-181 115 135460 PACK(N)E 115 1	DCT:115:180+182N	N/A			112%				122%		122%
	LN:115:182S	Base Case		104%				112%		102%	112%
135460 PACK(N)E 115 135538 LONG-182 115 1	DCT:115:180+181/922	N/A							106%		106%
135460 PACK(N)E 115 147850 NIAG115E 115 2	DCT:115:101+191	N/A							112%		112%
135461 PACK(S)W 115 147851 NIAG115W 115 1	LN:115:194	LN:115:195		117%				137%			137%
	LN:115:195	LN:115:194				109%				135%	135%
135461 PACK(S)W 115 147851 NIAG115W 115 2	LN:115:193	LN:115:195		117%				137%		135%	137%
	LN:115:195	LN:115:193				109%					109%
135461 PACK(S)W 115 147851 NIAG115W 115 3	DCT:115:193+194	N/A			103%				123%		123%
	LN:115:193	LN:115:194		107%		102%		127%		125%	127%
135467 SHAW-103 115 135470 SWAN-103 115 1	LN:115:101	LN:115:102						101%			101%
135497 ZRMN-133 115 135562 S214-133 115 1	First:Lockport_104	LN:115:130						100%			100%
	HUNTLEY - PACKARD 78 230	LN:115:130								100%	100%
	SB:130:PK	N/A							101%		101%
147850 NIAG115E 115 147842 NIAGAR2W 230 1	HUNTLEY - GARDENVILL 79 230	Base Case		100%							100%
	NIAGARA - PACKARD 61 230	SB:PA230_R506				123%					123%
	PACKARD 230/115 3TR	T:77&78								100%	100%
	SOMERSET - NEWROCH 1 345	NIAG - NEWROCH 1 345		100%							100%