New York ISO
Independent System Operator

NYISO Operating Study Summer 2024

A Report by the New York Independent System Operator

May 2024

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Executive Summary

This NYISO 2024 Summer Operating Study is conducted as a seasonal review of the projected thermal transfer capability for the Summer 2024 capability period. The study evaluates the projected internal and external thermal transfer capabilities for the forecasted load and dispatch conditions studied.

Internal interfaces transfer limits have changed due to network alterations in the New York Control Area (NYCA) and modeling assumptions. Notable findings for the Summer 2024 operating period are:

- West Central Reverse limit decreased by 175 MW due to the redistribution of flows attributed to change in load pattern in West and Genesee area.
- Moses south interface thermal transfer limit has decreased by 50 MW mainly due to redistribution of flows in North area.
- Central East interface increased by 1825 MW due to the addition of the Edic – Princetown (351 & 352) 345 kV lines.
- Total East interface increased by 75 MW due to the addition of the Edic – Princetown (351 & 352) 345 kV lines.
- UPNY-SENY limit increased by 1000 MW due to the addition of Lovett 345 kV station and change in ratings on Dolson – Rock Tavern (DART-44) 345 kV line.
- UPNY-ConEd interface limit increased by 200 MW due to the addition of Lovett 345 kV station.
- Sprainbrook – Dunwoodie South interface decreased by 50 MW due to the addition of the Edic – Princetown (351 & 352) 345 kV lines and the addition of Lovett 345 kV station.

External interface transfer limits have changed due to network alterations in the New York Control Area (NYCA) and neighboring areas and modeling assumptions. Notable findings for the Summer 2024 operating period are:

- The New York to Ontario transfer limit reduced by 50 MW mainly due to reduced line ratings on the Beck – Niagara (PA27) 230 kV tie line due to ongoing work.
- The Ontario to New York transfer limit reduced by 75 MW mainly due to reduced

line ratings on the Beck – Niagara (PA27) 230 kV tie line due to ongoing work.

INTRODUCTION

The NYISO 2024 Summer Operating Study report, prepared by the Operating Studies Task Force (OSTF) at the direction and with the guidance of the System Operations Advisory Subcommittee (SOAS), highlights the thermal analysis evaluation for the Summer 2024 capability period. This analysis indicates that, for the Summer 2024 capability period, the New York interconnected bulk power system can be operated reliably in accordance with the New York State Reliability Council Reliability Rules and the NYISO System Operating Procedures.

Thermal transfer limits cited in this report are based on the forecasted load and dispatch assumptions and are intended as a guide to system operations. Changes in generation dispatch or load patterns that significantly change pre-contingency line loadings may change limiting contingencies or limiting facilities, resulting in higher or lower interface transfer capabilities.

System Operators should monitor the critical facilities noted in the included tables along with other limiting conditions while maintaining bulk power system transfers within secure operating limits.

PURPOSE

The purpose of the study is to determine:

- The total transfer capabilities (TTC) between NYISO and adjacent areas including IESO, PJM and ISO-NE for normal conditions in the summer periods. The TTC is calculated based on NERC TPL-001-5.1 Category P1 and P2 contingencies and a set of selected Category P4, P5 and P7 contingencies.
- The TTC between NYISO and adjacent areas including IESO, PJM and ISO-NE for emergency conditions in the summer periods. The TTC is calculated based on NERC TPL-001-5.1 Category P1 and P2 contingencies.

System Operating Limit (SOL) Methodology

As identified in " FAC-011-4_Methodology for Establishing SOL for the Operations Horizon_20240401", the NYSRC Reliability Rules provide the documented methodology for use in developing System Operating Limits (SOLs) within the NYISO Reliability Coordinator Area. NYSRC Reliability Rules require compliance with all North American Electric Reliability Corporation (NERC) Standards and Northeast Power Coordinating Council (NPCC) Standards and Criteria. NYSRC Rule C.1, Tables C-1 and C-2 address the contingencies to be evaluated and the performance requirements to be applied. Rule C.1 also incorporates by reference Attachment H, NYISO

Transmission Planning Guideline #3-1, "Guideline for Stability Analysis and Determination of Stability-Based Transfer Limits" of the NYISO Transmission Expansion and Interconnection Manual.

STUDY PARTICIPANTS

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SYSTEM REPRESENTATION AND BASE STUDY ASSUMPTIONS

System Representation

The representation was developed from the NYISO Data Bank and assumes the forecast summer coincident peak load of 31,541 MW. The other NPCC Balancing Areas and adjacent regional representations were obtained from the RFC-NPCC Summer 2024 Reliability Assessment power flow base case and have been updated to reflect the Summer 2024 capability period. The base case model includes:

- The NYISO Transmission Operator area

- All Transmission Operator areas contiguous with NYISO
- All system elements modeled as in service
- All generation represented
- Phase shifters in the regulating mode in accordance with the NYISO Available Transfer Capability Implementation Document (ATCID)
- The NYISO Load Forecast
- Transmission Facility additions and retirements
- Generation Facility additions and retirements
- Remedial Action Scheme (RAS) models where currently existing or projected for implementation within the studied time horizon.
- Series compensation for each line at the expected operating level unless specified otherwise in the ATCID.
- Facility Ratings as provided by the Transmission Owner and Generator Owner

Generation Resource Changes

The status and dispatch level of generation represented in this analysis is a reasonable expectation based on the information available at the time of the study. Those modeling assumptions incorporate known unit outage status. The inter-Area schedules represented in the study base case are summarized in Appendix A. The following table shows generation deactivations and additions since the Summer 2023 capability period:

Deactivations	
Ravenswood – 1	-22 MW
South Cairo GT	-19 MW
Western NY Wind Power	-7 MW
Arthur Kill Cogen	-11 MW
Total Retirements	**-59 MW**
Additions	
Clear View Solar	20 MW
Dolan Solar	20 MW
CS Hawthorn	20 MW
Hills Solar	20 MW
East Point Solar	50 MW
High River Solar	90 MW
Riverhead Expansion	36 MW
KCE NY 6	20 MW

Darby Solar	20 MW
Stillwater Solar	20 MW
Total Additions	**316 MW**

Transmission Facilities Changes

Significant facility changes since the Summer 2023 capability period include:

- Lovett 345 kV Addition
- Edic – Princetown (351 & 352) 345 kV modeled lines in-service
- St. Lawrence – Moses (L34P) modeled in-service
- Elm Street 230 kV Transformer modeled out of service
- Plattsburgh (AT4) 230/115/14 kV transformer modeled out of service
- Willis – Ryan (WRY-2) 230 kV line modeled out of service
- Rotterdam – Swagertown (44) 115 kV line modeled out of service
- Greenidge – Montour Falls (967) 115 kV modeled out of service
- Shawnerd – Lockport (104) 115 kV modeled out of service
- E13 St. (BK13) 345/69 kV transformer modeled out of service

Lovett station 345 kV addition includes a new 345 kV station that taps on the previous Ladentown – Buchanan (Y88) 345 kV line. The line is now split into Ladentown – Lovett (Y66) 345kV & Lovett – Buchanan (Y88) 345kV. There is a new 345/138 kV transformer connecting Lovett 345 kV station to the existing 138 kV station. The Princetown 345 kV substation interconnects with Edic 345 kV station via two 345 kV Double-Circuit Tower lines Edic – Princetown (351) 345 kV & Edic – Princetown (352) 345 kV.

System Representation

The Siemens PTI PSS™E and PowerGEM's Transmission Adequacy and Reliability Assessment "TARA" software packages were used to calculate the thermal limits based on Normal and Emergency Transfer Criteria as defined in the NYSRC Reliability Rules. The thermal transfer limits presented have been determined for all transmission facilities scheduled in service during the Summer 2024 period.

The schedules used in the base case power flow for this analysis assumed a net flow of 0 MW from Public Service Electric & Gas (PSE&G) to Consolidated Edison via the PAR transformers controlling the Hudson – Farragut and Linden – Goethals interconnections, and 0 MW on the South

Mahwah – Waldwick circuits from Consolidated Edison to PSE&G, controlled by the PARs at Waldwick. The Hopatcong – Ramapo (5018) 500 kV circuit is scheduled to 316 MW from PJM to New York. The four Ontario – Michigan PARs are modeled in-service and scheduled to a 0 MW transfer. These schedules are consistent with the scenarios developed in the RFC-NPCC Inter-Regional Reliability Assessment for Summer 2024, and the MMWG Summer 2023 power flow base cases. The Dysinger – East Stolle Rd. PAR is scheduled to 400 MW from Dysinger to East Stolle Rd. The series reactors on the Sprain Brook – W. 49th St. (M51 and M52) 345 kV and the Dunwoodie – Mott Haven (71 and 72) 345 kV the Packard – Sawyer (77 and 78) 230 kV, the E. 179th St. – Hell Gate (15055) 138 kV circuits are in-service in the base case. The series reactors on the Farragut – Gowanus (41 and 42) 345 kV and the Sprain Brook – East Garden City (Y49) 345 kV cable are bypassed. The series capacitors on the Marcy – Coopers Corners (UCC2-41) 345 kV, the Edic – Fraser (EF24-40) 345 kV and the Fraser – Coopers Corners (33) 345 kV circuits are in-service in the base case. The series capacitors on the Knickerbocker – Pleasant Valley (Y57) 345 kV circuit are bypassed in the base case.

The NYISO Niagara generation was modeled using a 50-50 split on the 230 kV and 115 kV generators. The total output for the Niagara facility was modeled at 2,100 MW. The Ontario Niagara generation was modeled at an output of 1,300 MW.

DISCUSSION

Resource Assessment

Load and Capacity Assessment

The forecast peak demand for the Summer 2024 capability period is 31,541 MW[1]. This forecast is approximately 508 MW (1.58%) lower than the forecast of 32,048 MW for the Summer 2023 capability period, and 2,416 MW (7.12%) lower than the all-time New York Control Area (NYCA) seasonal peak of 33,956 MW, which occurred on July 19, 2013.

The Installed Capacity (ICAP) requirement for the Summer capability period is 38,480 MW based on the NYSRC 22.0% Installed Reserve Margin (IRM) requirement for the 2024 Capability Year. NYCA generation capacity for Summer 2024 is 37,867 MW, and net external capacity purchases of 1,585 MW have been secured for the Summer period. The combined capacity

[1] Forecast Coincident Peak Demand (50th percentile baseline forecast)

resources represent a 25.1% margin above the forecast peak demand of 31,541 MW. These values were taken from the 2024 Load & Capacity Data report produced by the NYISO.

The equivalent forced outage rate is 3.21%, and includes forced outages and de-ratings based on historical performance of all generation in the NYCA. For Summer 2023, the equivalent forced outage rate assumed was 3.79%.

Cross-State Interfaces

Transfer Limit Analysis

This report summarizes the results of thermal transfer limit analyses performed on power system representation modeling the forecast peak load conditions for Summer 2024. Normal and emergency thermal limits were calculated according to Normal and Emergency Transfer Criteria definitions in the NYSRC Reliability Rules. For this assessment period the most severe single generation contingency is Nine Mile Point 2 at 1,310 MW. Facility ratings applied in the analysis were from the online MW ratings in the EMS, and are detailed in Appendix D.

Figure 1 presents a comparison of the Summer 2024 thermal transfer limits to Summer 2023 thermal transfer limits. Changes in these limits from previous years are due to changes in the base case load flow generation and load patterns that result in different pre-contingency line loadings, changes in limiting contingencies, changes in circuit ratings, or line status. Appendix H presents a summary comparison of Cross-State thermal transfer limits between summer 2024 and 2023, with limiting element/contingency descriptions. Significant differences in these thermal transfer limits are discussed below.

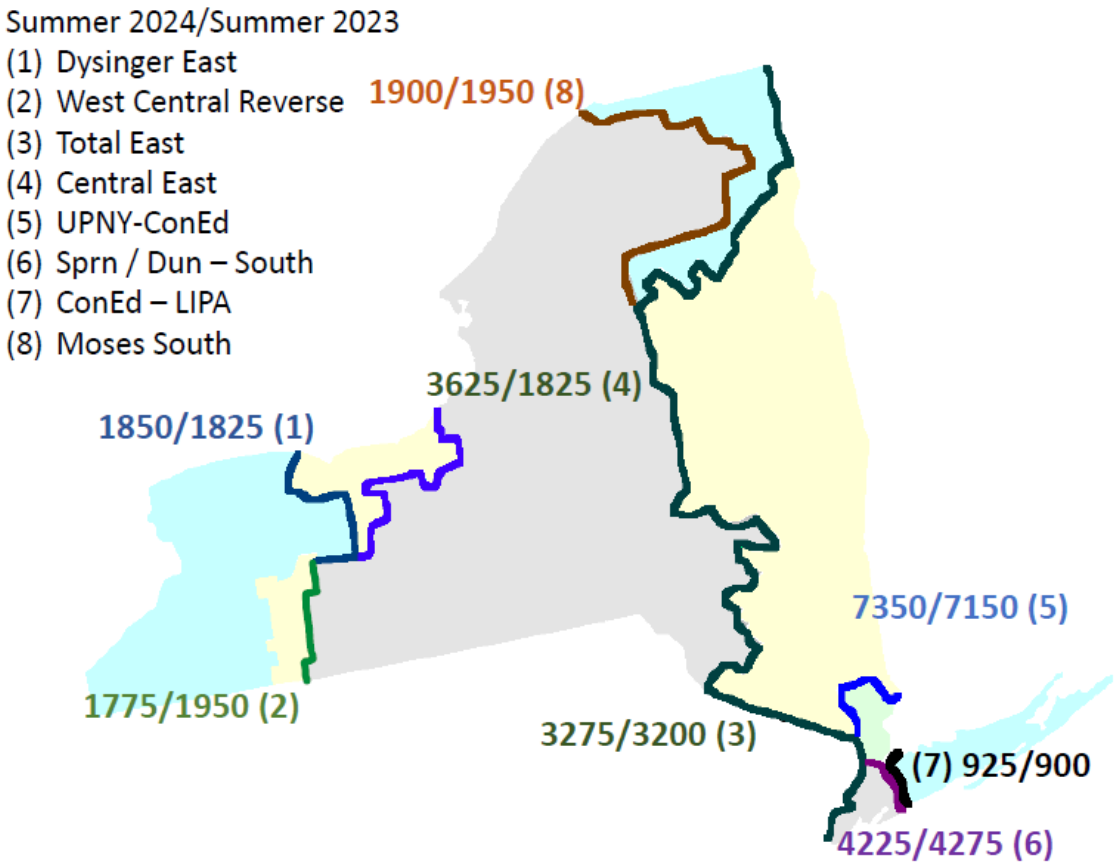

Figure 1 – Cross-State Thermal Transfer Limits

West Central Reverse interface thermal transfer limit decreased by 175 MW. This is mainly due to the redistribution of flows attributed to change in load pattern in West and Genesee areas.

UPNY-SENY interface thermal transfer limit increased by 1000 MW. This is mainly due to the addition of Lovett station as well as ratings increase on the previously limiting Dolson – Rock Tavern (DART-44) 345 kV line.

UPNY-ConEd interface thermal transfer limit has increased 200 MW. This is mainly due to the addition of Lovett 345 kV station

Sprainbrook Dunwoodie-South interface thermal transfer limit has decreased by 50 MW. This is mainly due to the addition of the Edic – Princetown (351) 345 kV & Edic – Princetown (352) 345 kV lines and the addition of Lovett 345 kV station.

Central East interface thermal transfer limit increased by 1825 MW. This is mainly due to the addition of the Edic – Princetown (351) 345 kV & Edic – Princetown (352) 345 kV lines.

Total East interface thermal transfer limit increased by 75 MW. This is mainly due to the addition of the Edic – Princetown (351) 345 kV & Edic – Princetown (352) 345 kV lines.

Moses South interface thermal transfer limit has decreased by 50 MW. This is mainly due to the redistribution of flows in North zone.

West Woodbourne Transformer

The Total-East interface may be limited at significantly lower transfer levels for certain contingencies that result in overloading of the West Woodbourne 115/69 kV transformer. Should the West Woodbourne tie be the limiting facility, it may be removed from service to allow higher Total-East transfers. Over-current relays are installed at West Woodbourne to protect for contingency overloads.

ConEd – LIPA Transfer Analysis

Normal transfer capabilities were determined using the base case generation dispatch and PAR settings as described in Appendix B. Emergency limits are dispatch dependent, and can vary based on generation and load patterns in the LIPA system.

For emergency transfer capability analysis, the PARs controlling the LIPA import were adjusted to allow for maximum transfer capability into LIPA:

ConEd – LIPA PAR Settings

	Normal	Emergency
Jamaica – Lake Success 138 kV	-200 MW	195 MW
Jamaica – Valley Stream 138 kV	-100 MW	113 MW
Sprain Brook – E. Garden City 345 kV	637 MW	637 MW

ISO-NE – LIPA PAR Settings

Norwalk Harbor – Northport 138 kV	100 MW	286 MW

The PAR schedules referenced above and the ConEd - LIPA transfer assessment assume the following loss factors and oil circulation modes in determination of the facility ratings for the 345 kV cables:

- Y49 has a 70% loss factor in slow oil circulation mode.

- Y50 has a 70% loss factor in rapid circulation mode.

Emergency Transfer via the 138 kV PAR-controlled Jamaica ties between ConEdison and LIPA

Con Edison and LIPA have determined possible emergency transfer levels via the Jamaica - Valley Stream (901) 138 kV and Jamaica - Lake Success (903) 138 kV PAR-controlled ties that could be used to transfer emergency power between the two entities during peak conditions. The emergency transfer levels were calculated in both directions, for system peak load conditions with all transmission lines in service and all generation available at full capacity.

ConEd to LIPA emergency assistance

Based on analysis of historical conditions performed by LIPA and Con Edison, Con Edison anticipates being able to supply a total flow up to 308 MW of emergency transfer from Con Edison to Long Island, if requested, via the ties.

LIPA to ConEd emergency assistance

LIPA anticipates being able to supply a total flow up to 505 MW of emergency transfer from Long Island to Con Edison, if requested, via the ties under ideal conditions (i.e. all lines and generation in-service, imports via Neptune, Norwalk Harbor to Northport Cable - NNC and Cross Sound Cable - CSC).

Transfer Limits for Outage Conditions

Transfer limits for scheduled outage conditions are determined by the NYISO Scheduling and Market Operations groups. The NYISO Real-Time Dispatch system monitors the EHV transmission continuously to maintain the secure operation of the interconnected EHV system.

Transient Stability and Voltage transfer Limits

The interface transfer limits shown in “SUMMARY OF RESULTS – THERMAL TRANSFER LIMIT ANALYSIS” section are the results of a thermal transfer limit analysis only. Transient stability and voltage interface transfer limits for all lines in-service and line outage conditions are summarized and available through the NYISO website located under “Interface Limits & Op Studies” at the following link

https://www.nyiso.com/reports-information

Thermal Transfer Capabilities with Adjacent Balancing Areas

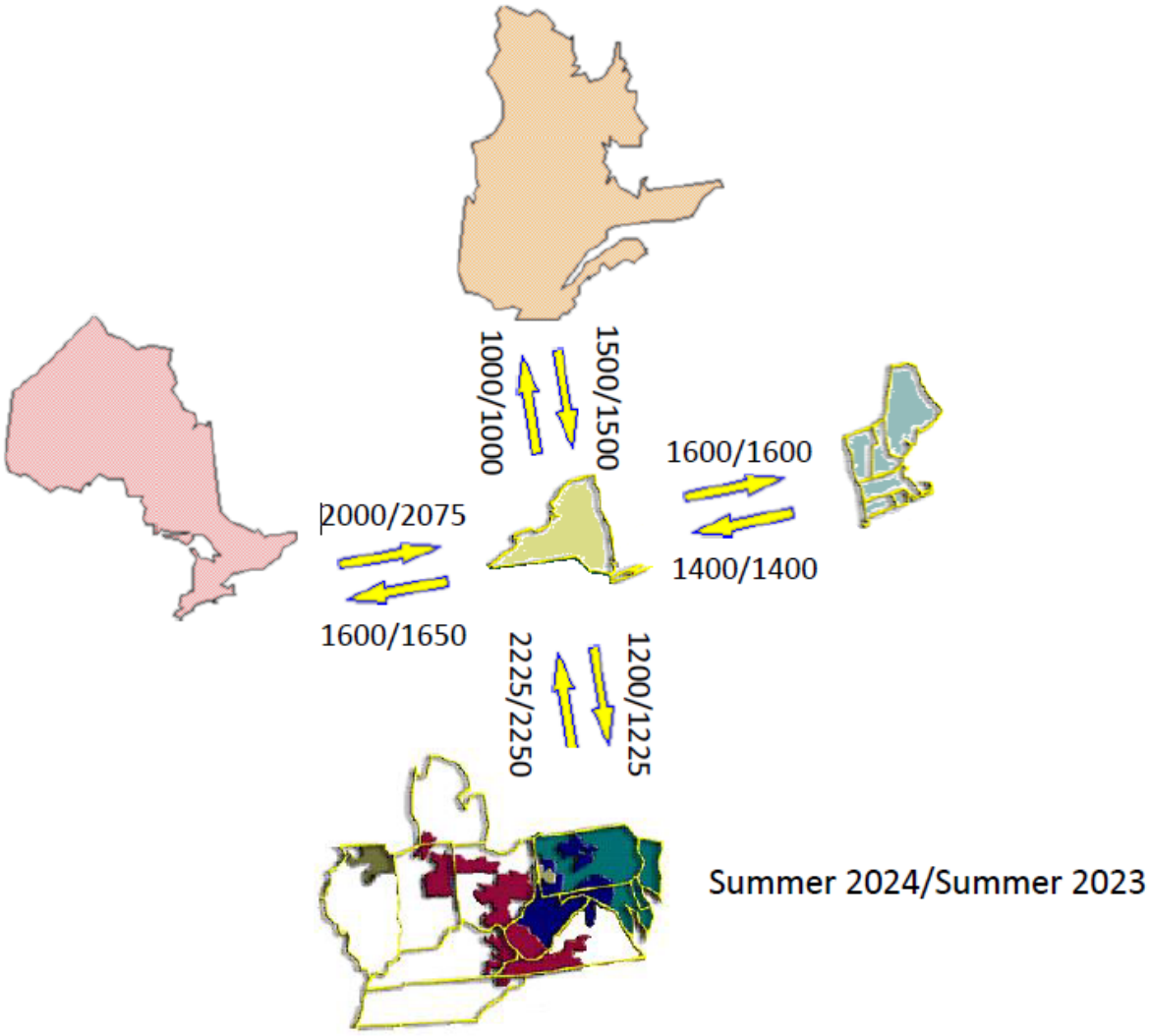

Figure 2 – Inter-Area Thermal Transfer Capabilities[2]

NYISO – Ontario interface thermal transfer limit decreased by 50 MW. This is mainly due to reduced line ratings on the Beck – Niagara (PA27) 230 kV tie line due to ongoing work.

Ontario – NYISO interface thermal transfer limit decreased by 75 MW. This is mainly due to reduced line ratings on the Beck – Niagara (PA27) 230 kV tie line due to ongoing work.

Thermal transfer limits between New York and adjacent Balancing Areas also are determined in this analysis. These transfer limits supplement, but do not change, existing internal operating

[2] TE-NY transfer capabilities shown in Figure 2 are not thermal transfer limits; for more information see page 18

limits. There may be facilities internal to each system that may reduce the transfer limits between Balancing Areas. Reductions due to these situations are considered to be the responsibility of the respective reliability authority. Some of these potential limitations are indicated in the summary tables by "Reliability Coordinating Facility" limits, which supplement the "Direct Tie" limits between the Balancing Areas. Transfer conditions within and between neighboring Balancing Areas can have a significant effect on inter- and intra-Area transfer limits. Coordination between Balancing Areas is necessary to provide optimal transfer while maintaining the reliability and security of the interconnected systems.

New York – New England Analysis

New England Transmission/Capacity Additions

Transmission

For the Summer 2024 study period, there are no major projects coming into service that will significantly impact the New York – New England transmission capability.

Capacity

In the New England Control Area, from April through September 2024, no major generation additions are anticipated. Approximately 367 MW of Solar Photovoltaic, 62 MW of Gas Turbines, 20 MWs of Fuel Cell, and 141 MW of Battery Alternative Energy Resources are anticipated to become commercial by the end of September 2024.

Approximately 1456 MW of Gas Turbines are expected to retire by the end of September 2024. These retirements include the Mystic 8 (703.3 MW) and Mystic 9 (709.7 MW) facilities.

Thermal Transfer Limit Analysis

The transfer limits between the NYISO and ISO New England for normal and emergency transfer criteria are summarized in Tables 2.a and 2.b.

Cross-Sound Cable

The Cross-Sound Cable (CSC) is an HVDC merchant transmission facility connecting the New Haven Harbor 345 kV (United Illuminating, ISO-NE) station and Shoreham 138 kV (LIPA, NYISO) station. It has a design capacity of 330 MW. This facility is not metered as part of the NYISO – ISO-NE interface, and HVDC transfers are independent of transfers between the NYISO and ISO-NE.

Smithfield – Salisbury 69 kV

CHG&E and Eversource will normally operate the Smithfield - Salisbury 69 kV (FV/690) line

closed. The maximum allowable flow on this line is 31 MVA based on limitations in the Eversource 69 kV system. When the ISO-NE to NYISO transfer is greater than approximately 400 MW, the line will be opened due to post contingency limits within the Eversource system. The FV/690 line has directional over-current protection that will trip the FV/690 line in the event of an overload when the flow is into ISO-NE. No protection exists to trip the FV/690 line in the event of an overload when the flow is into NYISO.

Northport – Norwalk Harbor Cable Flow

Flow on the NNC Norwalk Harbor to Northport facility is controlled by PAR transformer at Northport. As system conditions vary, the scheduled flow on the NNC may be used to optimize transfer capability between the Balancing Areas. The thermal transfer limits are presented in Table 2 for different PAR schedule assumptions on the Northport – Norwalk Harbor interconnection.

Whitehall – Blissville 115 kV

The PAR transformer on the K7 line at the VELCO Blissville substation will control pre-contingency flow between the respective stations. For the analyses, the pre-contingency schedule is 25 MW from Blissville (ISO-NE) to Whitehall (NYISO). The scheduled flow may be adjusted to protect the National Grid local 115 kV transmission south of Whitehall for 345 kV contingency events in southern Vermont pursuant to joint operating procedure developed by VELCO, National Grid, ISO-NE and NYISO.

Plattsburgh – Sand Bar 115 kV (i.e. PV20)

The PAR transformer on the PV20 line at the VELCO Sand Bar substation was modeled holding a pre-contingency flow of approximately 100 MW on the PV20 tie. This modeling assumption was premised upon common operating understandings between ISO-NE and the NYISO given local operating practice on the Moses – Willis – Plattsburgh 230 kV transmission corridor. ISO-NE's analysis examined and considered New England system limitations given this modeling assumption and did not examine generation dispatch or system performance on the New York side of the PV20 tie.

New York - PJM Analysis

Thermal Transfer Limit Analysis

The transfer limits for the NYISO – PJM and PJM – NYISO interfaces are summarized in Tables 3a and 3b respectively of the "SUMMARY OF RESULTS – THERMAL TRANSFER LIMIT ANALYSIS" section of this report. The Marion-Farragut 345 kV B and C cables are expected to remain open and

the Waldwick E, F, O and Goethals A paths are expected to deliver a percentage of the scheduled interchange as referenced in the NYISO-PJM JOA. The Hopatcong – Ramapo 500 kV (5018) circuit is scheduled in accordance with the "TCC Market PJM -NYISO Interconnection Scheduling Protocol", February 28th, 2020.

Opening of PJM - New York 115 kV Ties as Required

The normal criteria thermal transfer limits presented in "SUMMARY OF RESULTS – THERMAL TRANSFER LIMIT ANALYSIS" section were determined for an all lines in-service condition. The 115 kV interconnections between First Energy East and New York (Warren – Falconer, North Waverly – East Sayre, and Laurel Lake – Westover) may be opened in accordance with NYISO and PJM Operating Procedures provided that this action does not cause unacceptable impact on local reliability in either system. Over-current protection is installed on the Warren - Falconer and the North Waverly – East Sayre 115 kV circuits; either of these circuits would trip by relay action for an actual overload condition. This North Waverly-East Sayre scheme is expected to be designated as a RAS in the future and hence the line could be expected to be operated as in-service more often. There is no overload protection on the Laurel Lake - Westover circuit, but it may be opened by operator action if there is an actual or post-contingency overload condition. However, opening the Laurel Lake – Westover tie could potentially cause local thermal and pre- and post-contingency voltage violations for the 34.5 kV distribution system within First Energy East transmission zone. Sensitivity analysis performed indicated that the thermal and voltage conditions were exacerbated for conditions that modeled high simultaneous interface flows from NY to PJM and NY to Ontario.

DC Ties

Neptune DC tie is expected to be available. Hudson Transmission Project (HTP) DC tie is expected to be available.

Variable Frequency Transformer (VFT) Tie

The Variable Frequency Transformer Tie is a transmission facility connecting the Linden 230 kV (PSEG, PJM) to Linden 345 kV (ConEd, NYISO). For the summer 2024, Linden VFT will have 330 MW non-firm withdrawal right and 300 MW firm injection rights into PJM market.

Ontario – New York Analysis

Thermal Transfer Limit Analysis

The thermal transfer limits between the NYISO and Ontario's Independent Electricity System Operator (IESO) Balancing Areas for normal and emergency transfer criteria are presented in tables

4 and 5. The NYISO Niagara generation was modeled at an output of 2,100 MW.

The Ontario – New York ties at St. Lawrence, L33P and L34P PARs were controlling to 0 MW in all four scenarios. The interconnection flow limit across these ties is 300 MW, as presented in Table B3 "Interconnection Flow Limits" from the document "Reliability Outlook Tables" available at:

https://www.ieso.ca/-/media/Files/IESO/Document-Library/planning-forecasts/reliability-outlook/ReliabilityOutlookTables_2023Mar.ashx

Transient Stability Limitations

Transient stability limits for the NYISO - IESO interconnection are reported in "NYPP-OH TRANSIENT STABILITY TESTING REPORT on DIRECT TIE TRANSFER CAPABILITY - OCTOBER 1993" available at:

https://www.nyiso.com/documents/20142/3694079/NYPP-OH_1993-2.pdf/2e21484a-22cf-739a-7a10-69dfd69f5d58

Ontario – Michigan PARs

All of the PARs on the four transmission lines interconnecting Ontario and Michigan are in service and regulating. For this study, the PARs were scheduled to regulate at 0 MW.

Impact of the Queenston Flow West (QFW) Interface on the New York to Ontario Transfer Limit

The QFW interface is defined as the sum of the power flows through the 230 kV circuits out of Beck. QFW is the algebraic sum of the following:

- Total generation in the Niagara zone of Ontario including the units at the Beck #1, #2 & Pump Generating Stations, Thorold and Decew Falls GS
- The total load in the zone
- The import from New York

For a given QFW limit, the import capability from New York depends on the generation dispatch and the load in the Niagara zone. The Ontario Niagara generation is set to 1,300 MW. The import capability from New York can be increased by decreasing generation in the Ontario Niagara zone contingent on water and tourism regulations, increasing demand in the Ontario Niagara zone, or both.

TransÉnergie–New York Interface

Thermal transfer limits between TransÉnergie (Hydro-Quebec) and New York are not analyzed as part of this study. Respecting the NYSRC and NYISO operating reserve requirements, the maximum allowable delivery into the NYCA from TransÉnergie on the Chateauguay – Massena

(MSC-7040) 765 kV tie is 1310 MW. However in real-time the total flow is limited to 1800 MW; the additional flow is a “wheel-through” transaction to another Balancing Authority Area. Maximum delivery from NYCA to Quebec on the 7040 line is 1000 MW.

The Dennison Scheduled Line represents a 115 kV dual-circuit transmission line that interconnects the New York Control Area to the Hydro-Quebec Control Area at the Dennison Substation, near Massena, NY. The Dennison Line has a nominal north to south capacity of 270 MW in summer, into New York, and a nominal south to north capacity of 200 MW into Quebec. The south to north capacity will be limited to 100 MW into Quebec until such time as the HQ-Cedars Export Study report is approved by the Operating Committee and conditions outline in the report are satisfied.

SUMMARY OF RESULTS – THERMAL TRANSFER LIMIT ANALYSIS

Table 1 – NYISO CROSS STATE INTERFACE THERMAL TRANSFER LIMITS

- Table 1.a
    a. Dysinger East
    b. West Central Reverse
    c. UPNY – SENY
    d. UPNY – ConEd
    e. Sprain Brook – Dunwoodie So.
    f. ConEd – LIPA Transfer Capability
- Table 1.b – MSC-7040 Flow Sensitivity
    a. Central East
    b. Total East
    c. Moses South

Table 2.a – NYISO to ISO-NE INTERFACE THERMAL TRANSFER LIMITS

- Northport-Norwalk Flow Sensitivity
- Cricket Valley Energy Center I/S and O/S

Table 2.b – ISO-NE to NYISO INTERFACE THERMAL TRANSFER LIMITS

- Northport-Norwalk Flow Sensitivity
- Cricket Valley Energy Center I/S and O/S

Table 3.a – NYISO to PJM INTERFACE THERMAL TRANSFER LIMITS

- 3-115 kV Ties I/S and O/S
- Hudson – Farragut (B3402) 345 kV and Marion – Farragut (C3403) 345 kV lines and associated PARs I/S and O/S

Table 3.b – PJM to NYISO INTERFACE THERMAL TRANSFER LIMITS

- 3-115 kV Ties I/S and O/S
- Hudson – Farragut (B3402) 345 kV and Marion – Farragut (C3403) 345 kV lines and associated PARs I/S and O/S

Table 4 – IESO to NYISO INTERFACE THERMAL TRANSFER LIMITS

Table 5 – NYISO to IESO INTERFACE THERMAL TRANSFER LIMITS

TABLE 1.a – NYISO CROSS-STATE INTERFACE THERMAL TRANSFER LIMITS - SUMMER 2024

ALL LINES IN-SERVICE

	Dysinger East	West Central Reverse	UPNY - SENY	UPNY - ConEd[1]	Sprain Brook Dunwoodie - So.	ConEd – LIPA
NORMAL	1850 MW (1)	1775 MW (3)	5975 MW (5)	7350 MW (7)	4225 MW (8)	925 MW (10)
EMERGENCY	2125 MW (2)	2200 MW (4)	6150 MW (6)	8450 MW (6)	4225 MW (9)	1400 MW (11)

	LIMITING ELEMENT	RATING		Loss of	LIMITING CONTINGENCY
(1)	Niagara – Packard (61) 230 kV	@STE[3]	846 MW	L/O	Niagara – Packard (62) 230 kV Beck – Packard (BP76) 230 kV
(2)	Niagara – Dysinger (ND1) 345 kV	@STE	1685 MW	L/O	Niagara – Dysinger (ND2) 345 kV
(3)	Pannell – Clay (PC2) 345 kV	@LTE	1315 MW	L/O	Pannell – Clay (PC1) 345 kV Clay – Edic (1-16) 345 kV
(4)	Sta. 56 – Sta. 89 (25) 115 kV	@STE	129 MW	L/O	Rochester - Pannell (RP2) 345 kV
(5)	Pleasant Valley – Wood Street (F30) 345 kV	@LTE	2157 MW	L/O	East Fishkill – Wood Street (F38) 345kV East Fishkill – Wood Street (F39) 345kV
(6)	Coopers Corners – Middletown TAP (CCRT34) 345 kV	@STE	1792 MW	L/O	Dolson Ave – Rock Tavern (DART44) 345 kV
(7)	Lovett – Buchanan (Y88) 345 kV	@LTE	1894 MW	L/O	Pleasant Valley – Wood St (F30) 345 kV Pleasant Valley – Wood St (F31) 345 kV
(8)	Mott Haven – Rainey (Q11) 345 kV	@MTE[1]	1066 MW	L/O	(SB:MOTT345_6W) Rainey – Corona (PAR 5W) 138 kV Mott Haven – Rainey W. (5W) 345/138/13.8 kV Transformer
(9)	Dunwoodie – Mott Haven (71) 345 kV	@NORM	707 MW		Pre-Contingency Loading
(10)	Dunwoodie – Shore Rd. (Y50) 345 kV	@LTE	916 MW[2]	L/O	(SB:SPRA345_RNS2) Sprain Brook – East Garden City (Y49) 345 kV Sprain Brook – Academy (M29) 345 kV
(11)	Shore Rd. – Glenwood (365) 138 kV	@NORM	291 MW[2]		Pre-Contingency Loading

Note

1: The rating used for cable circuits during SCUC reliability analysis is the average of the LTE and STE rating (MTE Rating).

2: LIPA rating for Y50 circuit is based on 70 % loss factor and rapid oil circulation.

3: Dysinger East limit used the NYSRC Rules Exception No. 13 – Post Contingency Flows on Niagara Project Facilities

TABLE 1.b – NYISO CROSS-STATE INTERFACE THERMAL TRANSFER LIMITS - SUMMER 2024

ALL LINES IN-SERVICE

	MSC-7040 FLOW 800 MW	MSC-7040 FLOW 1310 MW	MSC-7040 FLOW 1600 MW
CENTRAL EAST			
NORMAL	3575 MW (3)	3625 MW (3)	3625 MW (3)
EMERGENCY	4100 MW (4)	4200 MW (4)	4200 MW (4)
TOTAL EAST			
NORMAL	3200 MW (1)	3275 MW (1)	3275 MW (1)
EMERGENCY	4725 MW (2)	4775 MW (2)	4775 MW (2)
MOSES SOUTH[1,2]			
NORMAL	1625 MW (5)	1900 MW (5)	2100 MW (7)
EMERGENCY	2100 MW (8)	2625 MW (6)	2350 MW (9)

	LIMITING ELEMENT	RATING			LIMITING CONTINGENCY
(1)	Sugarloaf – Sterling Forest (28)138 kV	@STE	285 MW	L/O	Rock Tavern – Ramapo (76) 345 kV Rock Tavern – Ramapo (77) 345 kV
(2)	Coopers Corner – Middletown TAP (CCRT-34) 345 kV	@STE	1792 MW	L/O	Dolson Ave – Rock Tavern (DART44) 345 kV
(3)	Fraser – Coopers Corner (33) 345 kV	@LTE	1721 MW	L/O	Edic – Princetown (351) 345 kV Marcy – Coopers Corner (UCC2-41) 345 kV
(4)	New Scotland – Leeds (93) 345 kV	@STE	1724 MW	L/O	New Scottland– Leeds (94) 345 kV
(5)	Adirondack – Porter (12) 230 kV	@LTE	478 MW	L/O	Marcy – Massena (MSU1) 765 kV Massena – Chateaguay (7040) 765 kV
(6)	Flat Rock – Browns Falls (1) 115 kV	@STE	142 MW	L/O	Colton – Higley (1) 115 kV
(7)	Moses – Adirondack (MA1) 230 kV	@LTE	386 MW	L/O	Chateauguay – Massena (MSC-7040) 765 kV Massena – Marcy (MSU1) 765 kV
(8)	Adirondack – Porter (12) 230 kV	@STE	560 MW	L/O	Moses – Massena (MSU1) 765 kV
(9)	Moses – Adirondack (MA2) 230 kV	@ STE	440 MW	L/O	Marcy – Massena (MSU1) 765 kV

Note

1: Moses South limit used the NYSRC Rules Exception No. 10 – Post Contingency Flows on Marcy AT-1 Transformer

2: Moses South limit used the NYSRC Rules Exception No. 12 – Post Contingency Flows on Marcy AT-2 Transformer

TABLE 2.a – NYISO to ISO-NE INTERFACE THERMAL TRANSFER LIMITS – SUMMER 2024

ALL LINES IN-SERVICE

	DIRECT TIE	NYISO FACILITY	ISO-NE FACILITY	DIRECT TIE	NYISO FACILITY	ISO-NE FACILITY
	Cricket Valley Energy Center Out of Service			Cricket Valley Energy Center in Service (1087 MW)		
Northport –Norwalk 0MW						
NORMAL	2175 MW (4)	3300 MW (6)[3]	2000 MW (7)	2075 MW (3)	1775 MW (6)[3]	2100 MW (7)
EMERGENCY	2450 MW (5)	3300 MW (6)[3]	2515 MW (8)	2550 MW (2)	1775 MW (6)[3]	2650 MW (8)
Northport –Norwalk 100MW						
NORMAL	2200 MW (4)	1925 MW (6)[3]	1850 MW (7)	2050 MW (1)	1725 MW (6)[3]	2050 MW (7)
EMERGENCY	2625 MW (5)	1925 MW (6)[3]	2375 MW (8)	2125 MW (2)	1725 MW (6)[3]	2600 MW (8)
Northport –Norwalk 200 MW						
NORMAL	1800 MW (1)	3125 MW (6)[3]	1675 MW (7)	1600 MW (1)	1650 MW (6)[3]	2000 MW (7)
EMERGENCY	1875 MW (2)	3125 MW (6)[3]	2215 MW (8)	1675 MW (2)	1650 MW (6)[3]	2515 MW (8)

	LIMITING ELEMENT	RATING			LIMITING CONTINGENCY
(1)	Northport – Norwalk Harbor (NNC) 138 kV	@LTE	518 MW	L/O	Cricket Valley – Long Mountain (398) 345 kV
(2)	Northport – Norwalk Harbor (NNC) 138 kV	@STE	532 MW	L/O	Cricket Valley – Long Mountain (398) 345 kV
(3)	Cricket Valley – Long Mountain (398) 345 kV	@LTE	1786 MW	L/O	Millstone G3 24.0 kV
(4)	Cricket Valley – Long Mountain (398) 345 kV	@LTE	1786 MW	L/O	Northfield MT – Berkshire (312) 345 kV Alps – Berkshire (393) 345 kV
(5)	Cricket Valley – Long Mountain (398) 345 kV	@NORM	1260 MW		Pre-Contingency Loading
(6)	Albany – Trinity (5) 115 kV	@STE	280 MW	L/O	East Greenbush – Regenron Tap (9) 115 kV
(7)	Northfield – Vernon VT (381) 345kV	@LTE	1195 MW	L/O	Northfield – Ludlow (354) 345kV
(8)	Northfield – Vernon VT (381) 345kV	@STE	1323 MW	L/O	Northfield – Ludlow (354) 345kV

NOTE

1: The Northport – Norwalk Harbor (NNC) flow is positive in the direction of transfer

2: The Northport – Norwalk Harbor (NNC) line is no longer part of the New York – New England Interface Definition

3: Internal Non-Secured Limit: Limit to secure internal transmission elements that are not secured with pricing in the NYISO markets.

TABLE 2.b – ISO-NE to NYISO INTERFACE THERMAL TRANSFER LIMITS – SUMMER 2024

ALL LINES IN-SERVICE

	DIRECT TIE	NYISO FACILITY	ISO-NE FACILITY	DIRECT TIE	NYISO FACILITY	ISO-NE FACILITY
	Cricket Valley Energy Center Out of Service			Cricket Valley Energy Center in Service (1087 MW)		
Northport –Norwalk 0MW						
NORMAL	2425 MW (1)	2300 MW (7)	1500 MW (5)	2500 MW (6)	2075 MW (7)[3]	1675 MW (5)
EMERGENCY	2425 MW (1)	2300 MW (7)	1650 MW (8)	2575 MW (1)	2075 MW (7)[3]	1825 MW (8)
Northport –Norwalk 100MW						
NORMAL	2100 MW (2)	2225 MW (7)	1500 MW (8)	2250 MW (4)	2025 MW (7)[3]	1675 MW (8)
EMERGENCY	2175 MW (3)	2225 MW (7)	1500 MW (8)	2325 MW (3)	2025 MW (7)[3]	1675 MW (8)
Northport –Norwalk 200 MW						
NORMAL	1650 MW (4)	2175 MW (7)	1400 MW (8)	1775 MW (4)	1950 MW (7)[3]	1525 MW (8)
EMERGENCY	1725 MW (3)	2175 MW (7)	1400 MW (8)	1850 MW (3)	1950 MW (7)[3]	1525 MW (8)

	LIMITING ELEMENT	RATING		LIMITING CONTINGENCY
(1)	Cricket Valley – Long Mountain (398) 345 kV	@NORM 1260 MW		Pre-Contingency Loading
(2)	Northport – Norwalk Harbor (NNC) 138 kV	@LTE 518 MW	L/O	Cricket Valley – Long Mountain (398) 345 kV
(3)	Northport – Norwalk Harbor (NNC) 138 kV	@STE 532 MW	L/O	Cricket Valley – Long Mountain (398) 345 kV
(4)	Northport – Norwalk Harbor (NNC) 138 kV	@LTE 518 MW	L/O	Cricket Valley – Long Mountain (398) 345 kV Cricket Valley ST3&GT3 18.0 kV
(5)	Norwalk Junction – Archers Lane (3403D) 345kV	@LTE 850 MW	L/O	Long Mountain – Frost Bridge (352) 345 kV
(6)	Bear Swamp – Eastover Road (E205) 230 kV	@LTE 519 MW	L/O	Berkshire – Alps (393) 345 kV
(7)	Reynolds Road 115/345 kV Transformer	@STE 646 MW	L/O	Knickerbocker – Alps (6) 345 kV
(8)	Norwalk – Singer (3280 & 3291) 345 kV	@NORM 1200 MW[4]		Pre-Contingency Loading

NOTE

1: The Northport – Norwalk Harbor (NNC) flow is positive in the direction of transfer
2: The Northport – Norwalk Harbor (NNC) line is no longer part of the New England – New York Interface Definition
3: Internal Non-Secured Limit: Limit to secure internal transmission elements that are not secured with pricing in the NYISO markets.
4: This rating reflects the combined total of all lines in the row.

TABLE 3.a – NYISO to PJM INTERFACE THERMAL TRANSFER LIMITS – SUMMER 2024

ALL LINES IN-SERVICE

	DIRECT TIE	NYISO FACILITY	PJM FACILITY	DIRECT TIE	NYISO FACILITY	PJM FACILITY
	B&C PARs In-Service			B&C PARs Out-Of-Service		
NORMAL	1700 MW (1)	1075 MW (2)[3]	2250 MW (7)	1525 MW (1)	875 MW (2)[3]	2100 MW (7)
3-115-O/S[4]	2300 MW (5)	1200 MW (2)[3]	2100 MW (7)	2125 MW (5)	1025 MW (2)[3]	1950 MW (7)
EMERGENCY	1700 MW (1)	1100 MW (6)[3]	2250 MW (7)	1525 MW (1)	925 MW 6)[3]	2100 MW (7)
3-115-O/S[4]	2500 MW (3)	1725 MW (4)[3]	2100 MW (7)	2325 MW (3)	1525 MW (4)[3]	1950 MW (7)

	LIMITING ELEMENT	RATING		LIMITING CONTINGENCY
(1)	Westover – Laurel Lake (952) 115 kV	@NORM 108 MW		Pre-Contingency Loading
(2)	Oakdale 115/345 kV Transformer (BK 2)	@LTE 454 MW	L/O	Oakdale – Watercure (31) 345 kV Oakdale (BK 3) 345/115/34.5 kV Transformer
(3)	Hillside – East Towanda (70) 230 kV	@STE 630 MW	L/O	Watercure Rd – Mainesburg (30) 345 kV
(4)	S. Oswego – Goudey (961) 115 kV	@STE 143 MW	L/O	Hillside – Watercure (69) 230 kV
(5)	Hillside – East Towanda (70) 230 kV	@LTE 549 MW	L/O	Watercure Rd – Mainesburg (30) 345 kV
(6)	Oakdale – Goudey (939) 115 kV	@NORM 238 MW		Pre-Contingency Loading
(7)	Ridgeway – Forest 115 kV	@STE 160 MW	L/O	Glade – Forest 115 kV

NOTE

1: Emergency Transfer Capability Limits may have required line outages as described in New York – PJM Analysis Section.
2: PAR schedules have been adjusted in the direction of transfer.
3: Internal Non-Secured Limit: Limit to secure internal transmission elements that are not secured with pricing in the NYISO markets.
4: Goudey 115 kV Bus Tie breaker is placed in-service when 115 kV tie lines are placed out-of-service.

TABLE 3.b – PJM to NYISO INTERFACE THERMAL TRANSFER LIMITS – SUMMER 2024

ALL LINES IN-SERVICE

	DIRECT TIE	NYISO FACILITY	PJM FACILITY	DIRECT TIE	NYISO FACILITY	PJM FACILITY
	B&C PARs In-Service			B&C PARs Out-Of-Service		
NORMAL	1575 MW (1)	2125 MW (2)[3]	1950 MW (8)	1325 MW (1)	1900 MW (2)[3]	1725 MW (8)
3-115-O/S	2275 MW (4)	2225 MW (3)[3]	2450 MW (5)	2025 MW (4)	2000 MW (3)[3]	2200 MW (5)
EMERGENCY	1900 MW (10)	2300 MW (7)[3]	1950 MW (8)	1650 MW (10)	2025 MW (11)[3]	1725 MW (8)
3-115-O/S	2475 MW (6)	2225 MW (7)[3]	3000 MW (9)	2250 MW (6)	2000 MW (7)[3]	2750 MW (9)

	LIMITING ELEMENT	RATING			LIMITING CONTINGENCY
(1)	North Waverly – East Sayre (956) 115 kV	@STE	127 MW	L/O	Hillside – East Towanda (70) 230 kV Hillside – Watercure (69) 230 kV Hillside 230/115 kV Transformer
(2)	North Waverly – Hillside (962) 115 kV	@STE	145 MW	L/O	Hillside – East Towanda (70) 230 kV Hillside – Watercure (69) 230 kV Hillside 230/115 kV Transformer
(3)	Stolle Rd. (BK 3) 345/115 kV Transformer	@LTE	299 MW	L/O	Five Mile Road 345/115 kV (BK1) Transformer
(4)	Hillside – East Towanda (70) 230 kV	@LTE	549 MW	L/O	Watercure Rd – Mainesburg (30) 345 kV
(5)	Homer City 345/230/23 kV (AUTO-S) Transformer	@LTE	827 MW	L/O	Homer City 345/230/23 kV (AUTO-N) Transformer
(6)	Hillside – East Towanda (70) 230 kV	@STE	630 MW	L/O	Watercure Rd. – Mainesburg (30) 345 kV
(7)	Stolle Rd. (BK 3) 345/115 kV Transformer	@NORM	249 MW		Pre-Contingency Loading
(8)	North Meshoppen – Lenox 115 kV	@NORM	118 MW		Pre-Contingency Loading
(9)	Homer City 345/230/23 kV (AUTO-S) Transformer	@STE	983 MW	L/O	Homer City 345/230/23 kV (AUTO-N) Transformer
(10)	North Waverly – East Sayre (956) 115 kV	@STE	127 MW	L/O	Hillside – East Towanda (70) 230 kV
(11)	North Waverly – Lounsberry (962) 115 kV	@STE	143 MW	L/O	Watercure – Oakdale (31) 345 kV Clarks Corners – Oakdale (36) 345 kV

NOTE

1: Emergency Transfer Capability Limits may have required line outages as described in New York – PJM Analysis Section.
2: PAR schedules have been adjusted in the direction of transfer.
3: Internal Non-Secured Limit: Limit to secure internal transmission elements that are not secured with pricing in the NYISO markets.

TABLE 4 – IESO to NYISO INTERFACE THERMAL TRANSFER LIMITS – SUMMER 2024

ALL LINES IN-SERVICE

	DIRECT TIE	NYISO FACILITY	IESO FACILITY[1]
NORMAL	2000 MW (1)	3350 MW (3)[2]	2425 MW (4)
EMERGENCY	2475 MW (2)	3350 MW (3)[2]	2425 MW (4)

	LIMITING ELEMENT	RATING			LIMITING CONTINGENCY
(1)	Beck – Niagara (PA27) 230 kV	@LTE	446 MW	L/O	Beck – Niagara (PA301) 345 kV
(2)	Beck – Niagara (PA27) 230 kV	@STE	558 MW	L/O	Beck – Niagara (PA301) 345 kV
(3)	Homer Hill – Andover (157) 115 kV	@STE	108 MW	L/O	Weathersfield – South Perry (85) 230 kV
(4)	Portland – Hearn (H14)	@NORM	378 MW		Pre-Contingency Loading

Note

1: Ontario - NYISO limit used the NYSRC Rules Exception No. 13 – Post Contingency Flows on Niagara Project Facilities
2: Internal Non-Secured Limit: Limit to secure internal transmission elements that are not secured with pricing in the NYISO markets.

TABLE 5 – NYISO to IESO INTERFACE THERMAL TRANSFER LIMITS – SUMMER 2024

ALL LINES IN-SERVICE

	DIRECT TIE	NYISO FACILITY	IESO FACILITY[1]
NORMAL	1600 MW (1)[3]	1975 MW (2)[2,3]	1375 MW (3)
EMERGENCY	1900 MW (4)[3]	2075 MW (5)[2,3]	1775 MW (6)

	LIMITING ELEMENT	RATING			LIMITING CONTINGENCY
(1)	Beck – Niagara (PA27) 230 kV	@LTE	446 MW	L/O	Beck – Niagara (PA301) 345 kV Niagara 345/230 kV Transformer (AT3)
(2)	Farmington – Hamilton (7-893) 115 kV	@STE	155 MW	L/O	Pannell – Clay (2) 345 kV Rochester – Pannell (RP2) 345 kV
(3)	Beck – Hannon (Q24HM) 220 kV	@LTE	480 MW	L/O	Middleport – Beach - Carluke (Q25BM) 220 kV Beck – Middleport – Beach (Q29HM) 220 kV
(4)	Beck – Niagara (PA27) 230 kV	@NORM	388 MW		Pre-Contingency Loading
(5)	Farmington – Hamilton (7-893) 115 kV	@STE	155 MW	L/O	Pannell – Clay (2) 345 kV
(6)	Beck – Hannon (Q24HM) 220 kV	@NORM	404 MW		Pre-Contingency Loading

Note

1: This limit can be increased by reducing generation or increasing demand in the Niagara zone of Ontario contingent on water and tourism regulations. See Ontario – New York Analysis for discussion.

2: Internal Non-Secured Limit: Limit to secure internal transmission elements that are not secured with pricing in the NYISO markets.

3: This limit can be increased by adjusting the PAR schedule on the Dysinger – East Stolle Rd (DES-1) 345 kV line