NYISO OPERATING STUDY
SUMMER 2004

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Approved by the NYISO Operating Committee
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NYISO OPERATING STUDY - SUMMER 2004

1. INTRODUCTION

The following report, prepared by the Operating Studies Task Force (OSTF) at the direction and guidance of the System Operations Advisory Subcommittee (SOAS), highlights the significant results of the thermal analysis completed for the Summer 2004 capability period. This analysis indicates that, for the Summer 2004 capability period, the New York interconnected bulk power system can be operated reliably in accordance with the "NYSRC Reliability Rules for Planning and Operating the New York State Power System" (September 10, 1999) and the NYISO System Operating Procedures.

Installed Capacity (ICAP) resources of 37,524 MW are anticipated to be adequate to meet the forecast peak demand of 31,800 MW. Based on the Load and Capacity assessment, the NYISO will have adequate operating reserve during the peak load period.

2. RECOMMENDATIONS

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

Transfer limits cited in this report are based on the forecast peak load conditions and are intended as a guide to system operation. Changes in generation dispatch or load patterns that significantly change pre-contingency line loadings may change limiting contingencies or limiting facilities, and result in higher, or lower, interface transfer capabilities.

3. SYSTEM REPRESENTATION AND BASE STUDY ASSUMPTIONS

I. System Representation

The representation was developed from the NYISO Databank and assumes the forecast summer coincident peak load of 31,800 MW. The other NPCC members and adjacent regions representations were obtained from MEN/VEM Summer 2004 Reliability Assessment power flow.

For the Summer 2004 peak load period no significant generation is expected to be out of service. The generator output levels for major EHV-connected units are summarized in Appendix B, and are consistent with typical operation for the period. The inter-Area schedules represented in the study base case are summarized in Appendix A, and are consistent with those modeled in the MEN/VEM Summer 2004 Reliability Assessment.

Significant changes in the NYISO system since the Summer 2003 capability period include:

Ravenswood #4 Combined Cycle (250MW)	**4/2004**
Plattsburgh–Sandbar (PV-20) Phase Angle Regulator at Plattsburgh	**Out of service**
Phase Angle Regulator at Sand Bar (new)	**In Service**

The phase angle-regulating transformer at Plattsburgh controlling the Plattsburgh, New York to Sandbar, Vermont 115kV circuit (PV-20) was also out of service during the Winter 2003-04.

II. Base Study Assumptions

The PTI MUST thermal transfer analysis program and PSS/E power flow are used to determine the Normal and Emergency Criteria thermal limits. The thermal limits presented have been determined for all transmission facilities scheduled in service during the Summer 2004 period.

The schedules used in the base case loadflows for this analysis assumed a flow of 1000 MW from PSE&G to Consolidated Edison via the phase-angle-regulating (PAR) transformers controlling the Hudson – Farragut and Linden – Goethals interconnections, and 1000 MW on the South Mahwah – Waldwick circuits from Consolidated Edison to PSE&G, controlled by the PARs at Waldwick. The Branchburg - Ramapo 500 kV (5018) circuit is scheduled in accordance with the "Ramapo Phase Angle Regulator Operating Procedure", December 11, 1987. These schedules are consistent with the scenarios developed in the MAAC-ECAR-NPCC (MEN) Inter-Regional Reliability Assessment for Summer 2004, and the NERC/MMWG Summer 2004 load flow base case.

Thermal transfer capabilities between New York and adjacent Areas are also determined in this analysis. These transfer limits supplement, but do not change, existing internal operating limits. *There may be facilities internal to each system that may reduce the transfer capability between 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 "____ Facility" limits, which supplement the "Direct Tie" limits. Transfer conditions within and between neighboring Areas can have a significant effect on inter- and intra-Area transfer capabilities. Coordination of schedules and conditions between Areas is necessary to provide optimal transfer conditions while maintaining the reliability and security of the interconnected systems.

4. DISCUSSION

I. Resource Assessment

Load and Capacity Assessment

The forecast peak demand for the Summer 2004 capability period is 31,800 MW. This forecast is approximately 1.18% above the forecast for Summer 2003 capability 31,430 MW period, and 2.64% above the all-time New York control area seasonal peak of 30,982 MW, which occurred on August 9, 2001. The Installed Capacity (ICAP) requirement of 37,524 MW, based on the NYSRC 18% reserve requirement, is anticipated to be adequate to meet forecast demand.

NYISO Peak Load and Capacity Assessment – Summer 2004

NYISO ICAP Requirement	37524
Net of full-responsibility purchases/sales	0
Scheduled generation outages	12
Allowance for unplanned outages	3647
Net capacity for load	33865
NYISO Forecast Peak	31800
Operating Reserve Requirement	1800
Available Reserve	***2065***
Net Margin	265

The assumed allowance for unplanned outages is an equivalent forced outage rate of 9.72% and includes forced outages and de-ratings based on historical performance of all generation in the

New York control area. For Summer 2003 the equivalent forced outage rate assumed was 10.4%.

The NYISO load forecast for Summer 2004 is 370MW higher than the forecast for Summer 2003. Based on the forecast load and assumed outage rates, the NYISO will have sufficient resources to meet its reserve requirement for the season peak.

II. Cross-State Interfaces

A. Transfer Limit Analysis

Figure 1 presents a comparison of the Summer 2004 thermal transfer limits to Summer 2003. Changes in these limits from last year 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, or changes in circuit ratings, or line status. Appendix H presents a summary comparison of Cross-State thermal transfer limits between Summer 2004 and 2003, with limiting element/contingency descriptions. Significant differences in these thermal transfer limits are discussed below.

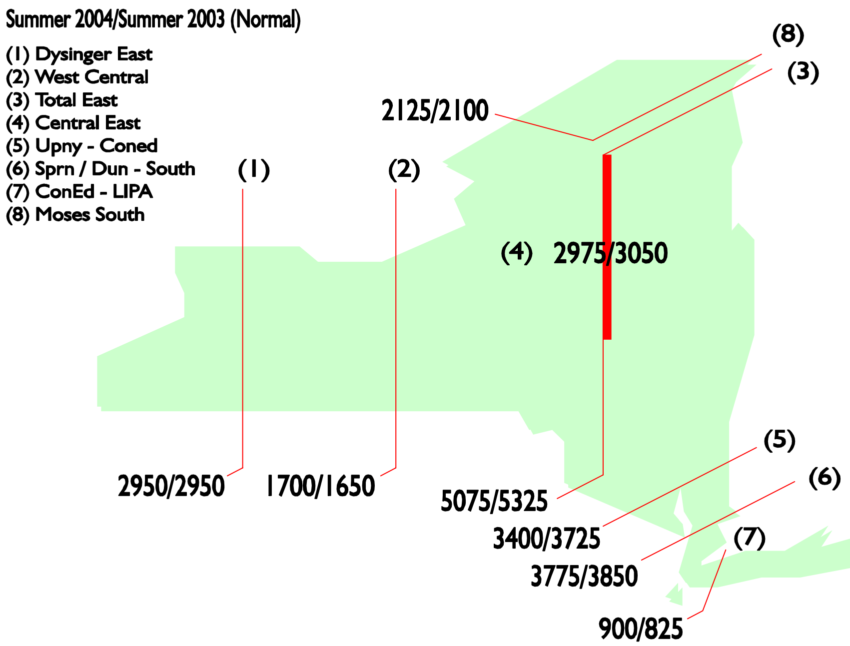

Figure 1 – Cross-State Thermal Transfer Limits

Total East thermal transfer limits have decreased of 250 MW. The decrease is due to the change in limiting elements/contingencies. For the Summer 2003, the limiting element was Fraser – Coopers Corners 345kV for the loss of Marcy – Coopers Corners (UCC2-41) 345kV and Porter – Rotterdam 230kV. In summer 2004 the limiting element is New Scotland – Leeds (93) 345kV for the loss of New Scotland – Leeds (94) 345kV.

UPNY – ConEd interface limit has decreased 325 MW. Changes in the Ramapo PAR schedules account for most of this change. The addition of the Bowline Point 345/138 kV transformer unloads the Ladentown to Buchanan South 345 kV line. This transformer was not modeled in the Summer 2003 case. The Leeds to Athens and Athens to Pleasant Valley line impedances were slightly modified which also contributed to the overall reduction.

B. Sensitivity Testing

The thermal limits presented in Section 5 were determined using the base conditions and schedules. The effects of various intra- and inter-Area transfers or generation patterns in the system are presented in Appendix G.

Phase angle regulator schedules may vary from day-to-day. Sensitivity analysis for selected interfaces has been included for the Ramapo, St. Lawrence, and Northport interconnections. Graphs showing the sensitivity of the interface limit to the PAR schedule are included in Appendix G.

C. 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 115/69kV transformer. Should the West Woodbourne tie be the limiting facility, it may be removed from service to allow higher Total-East transfers. An overcurrent relay is installed at West Woodbourne to protect for contingency overloads.

D. ConEd - LIPA Transfer Analysis

Normal transfer limits were determined using the base case generation dispatch and PAR settings as described in Appendix B. Both normal and emergency limits are dispatch dependant and can vary based on generation and load patterns in the LIPA system.

For emergency transfer limit analysis the ConEd - LIPA PARs were adjusted to allow for maximum transfer capability into LIPA:

ConEd - LIPA PAR Settings

	Normal	**Emergency**
Jamaica – Lake Success 138kV	-148MW	0MW
Jamaica – Valley Stream 138kV	-104MW	175MW
Sprain Brook – E. Garden City 345kV	632MW	638MW
Norwalk Harbor – Northport 138kV	100MW	286MW

E. 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 Security Constrained Dispatch system monitors the EHV transmission continuously to maintain the secure operation of the interconnected system.

F. Transient Stability Limits

The thermal interface limits in Section 5 do not include the results of transient stability testing. The existing all lines in service and maintenance outage stability interface limits, are summarized in Appendix I.

III. Thermal Transfer Capabilities with Adjacent Control Areas

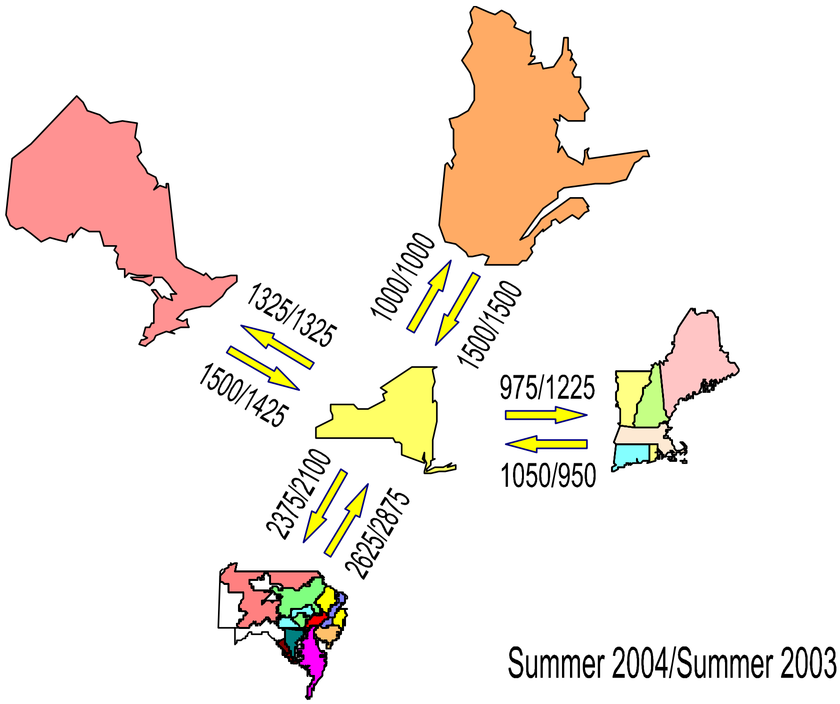

Figure 2 – Inter-Area Thermal Transfer Capabilities

A. New York – ISO New England Analysis

1. Transmission/Capacity Additions

a) New England

Transmission
In the New England Control Area, the Coolidge – West Rutland 115 kV transmission path in Vermont is now operated at 345 kV. A 345/115 kV transformer was placed in service at West Rutland in March 2003. A second 345/115 kV transformer was installed at West Rutland in October 2003.

Capacity
In the New England Control Area, from September 2003 through January 2004, no additional capacity has been added. An additional 262 MW (summer capability) of new capacity is expected to be in service prior to the start of the Summer 2004 capability period. During the Summer 2004 period, an additional 250 MW of capacity may become available. Since the beginning of the previous summer (2003) capability period, the following new generation has become available or is expected to be available:

Mystic 9	750 MW
Fore River	750 MW
Brascan	12 MW
PDC – Milford 1	250 MW
PDC – Milford 2	250 MW

b) New York

Last Fall, in the New York Control Area, at the Whitehall station, connections and conductors on the Whitehall - Rutland 115kV (line #7) were replaced to upgrade the thermal ratings of the circuit. [500 CU conductor was replaced with 1272 AL conductor; raising the NMPC seasonal MVA ratings of the line to: NOR = 200, LTE = 239, STE = 239.]

2. Thermal Transfer Limit Analysis

The transfer limits between the NYISO and ISO New England for normal and emergency transfer criteria are summarized in Section 5, Table 2. Referring to Figure 2 the transfer capability from NY to NE has decreased by 250 MW due to the increase in the pre-transfer loading of the Pleasant Valley – Long Mountain 345kV circuit.

3. Cross-Sound Cable

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

4. Smithfield – Salisbury 69kV

CHG&E and Northeast Utilities will operate the Smithfield - Salisbury 69 kV (FV/690) line normally open during the summer period due to post-contingency limits within the Northeast Utilities system. When the ISO-NE to NYISO transfer is less than approximately 400 MW, however, the line may be closed. When closed, the maximum allowable flow on this line is 28 MVA based on limitations in the Northeast Utilities 69 kV system. The FV/690 line has directional over-current protection that will trip the line in the event of an overload when the flow is into Northeast Utilities. This facility will not limit transfers between NYISO and ISO-NE.

5. Northport - Norwalk Harbor Cable Flow

Flow on this facility is controlled by a phase angle-regulating (PAR) transformer at Northport. As system conditions vary the following may be used to optimize transfer capability between the Areas. The thermal transfer limits are presented in Table 2 for two different PAR schedule assumptions on the Northport – Norwalk Harbor interconnection. Exhibits in Appendix G graphically demonstrate the optimization of transfer capability by regulating the flow on the Northport-Norwalk Harbor tie.

New York to New England: With power flowing from New York to New England on the Northport to Norwalk Harbor (1385) cable, potential overloads of the Norwalk Harbor to Rowayton Junction (1867) and the Norwalk Harbor to Rowayton Junction (1880) circuits must be considered as follows:

The flow from Norwalk Harbor to Rowayton Junction (1867) should not exceed 237 MVA (Normal rating of Norwalk Harbor to Rowayton Junction (1867).

- The flow from Norwalk Harbor to Rowayton Junction (1880) should not exceed 214 MVA (Normal rating of Norwalk Harbor to Rowayton Junction (1880)).

New England to New York: With power flowing from New England to New York on the Norwalk Harbor to Northport (1385) cable, potential overloads of the Trumbull Junction to Weston (1730) circuit must be considered as follows:

- The algebraic sum of the flow from Trumbull Junction to Weston (1730) and 27% of the flow from Pequonnock to Trumbull Junction (1710) and 29% of the flow from Devon to Trumbull Junction (1710) should not exceed 239 MVA

(STE rating of Trumbull Junction to Weston (1730)).

- The algebraic sum of the flow from Trumbull Junction to Weston (1730) and 25% of the flow from Pequonnock to Ash Creek (91001) and 21% of the flow from Bridgeport Resco should not exceed 239 MVA (STE rating of Trumbull Junction to Weston (1730)).

- In order to transfer 200 MVA from Norwalk Harbor to Northport, Norwalk Harbor generation should be on.

6. Plattsburgh – Sandbar (PV-20) Circuit

A new phase angle regulating transformer controlling the Plattsburgh, NY, to Sandbar, VT, 115kV circuit (PV-20) is expected to be placed in service at Sandbar by June 2004. The phase angle regulator at Plattsburgh is out of service for repair and is bypassed.

7. Transient Stability Limitations

For certain system configurations, stability performance determines the transfer capability between the Areas. For those instances, the limits have been obtained from the report "1992-1996 NYPP-NEPOOL TRANSFER LIMIT STUDY - OCTOBER 1992." These stability transfer limits are presented in Appendix I.

The stability limits are expressed in terms of the transfer on the "Northern Ties", i.e., excluding flow on the Norwalk Harbor – Northport circuit. Stability limits for transfers from New England to New York are a function of the New England MW load level, and include the effect of Northfield and Bear Swamp in the generating and pumping mode.

B. New York - PJM Analysis

1. Thermal Transfer Limit Analysis

The transfer limits for the New York - PJM interface are summarized in Section 5, Table 3. The phase angle regulating transformers controlling the Branchburg – Ramapo 500kV circuit are used to maintain flow at the normal rating of the Ramapo 500/345kV transformer (1000 MW) in the direction of the transfer.

The comparison with Summer 2003 in Figure 2 shows an increase of 275 MW from New York to PJM; due to the changes in the base case dispatch of generation in the PJM area.

2. Opening of PJM to New York 115 kV Ties as Required

The normal criteria thermal transfer limits presented in Section 5 were determined for an all lines in-service condition. The 115kV interconnections between GPU Energy and New York (Warren - Falconer, North Waverly - East Sayre, and Laurel Lake - Goudey) may be opened in accordance with NYISO and PJM Operating Procedures provided this 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 115kV circuits; either of these circuits would trip by relay action for an ***actual overload*** condition. There is no overload protection on the Laurel Lake - Goudey circuit, however it may be opened by operator action if there is an actual or post-contingency overload condition. The results presented in Table 3 include limits that assume one (or more) of these lines removed from service to achieve higher inter-Area transfer capability.

C. Ontario – New York Analysis

1. Thermal Transfer Limit Analysis

The thermal limits between the New York ISO and the Independent Market Operator (IMO-Ontario) Areas for normal and emergency transfer criteria are presented in Section 5, Table 4. The transfer limits are determined for two assumed schedules on the phase angle regulating transformers controlling the L33P and L34P interconnections at St. Lawrence.

The New York to Ontario is unchanged from last summer.

2. Transient Stability Limitations

Transient stability limits for the NYISO - IMO interconnection are reported in "NYPP-OH TRANSIENT STABILITY TESTING REPORT on DIRECT TIE TRANSFER CAPABILITY - OCTOBER 1993." This stability testing is summarized in Appendix I of this report.

3. Ontario – Michigan PARs

Phase Angle Regulating transformers have been installed on the interconnections between Ontario and Michigan:

Lambton – St. Clair 345kV	L4D
Lambton – St. Clair 230kV	L51D
Scott – Bunce Creek 230kV	B3N

These new PARs are represented in the powerflow base case holding fixed angle (free-flow MW) or bypassed. The existing PAR controlling the Waterman – Keith (J5D) circuit is controlling a schedule of 0MW in the base case.

The collapsed tower of circuit B3N does not yet have a firm replacement date. The failed phase shifter that is part of B3N (PS3) has not yet been removed from site to be repaired. The phase shifter in circuit L51D (PS51) at Lambton is being evaluated to determine the extent of any internal damage. The phase shifter for L4D (PS4) is scheduled to return to service at the end of April 2004.

4. Generation Rejection for Loss of L33P/L34P-St. Lawrence Ties

The interface limits were determined for a particular load, transmission and generation pattern. When system conditions vary from those forecast in the study, normal interface limits may vary. Generation rejection special protection systems (SPSs) are available at Beauharnois, St. Lawrence/Saunders, and St. Lawrence/FDR to reject generation for the loss of the L33P and/or L34P interconnections. Ontario or NYPA operators consistent with system conditions can select these SPSs.

Of the two circuits, L33P is more limiting. At 0 degrees phase shift the limiting STE rating is 465 MVA (voltage regulator rating). The outage distribution factor for the loss of L34P is 0.601 and based on this, the maximum pre-contingency flow on each circuit should not exceed 290 MW. At 40 degrees phase shift the limiting STE rating is 334 MVA (PAR rating). The outage distribution factor for the loss of L34P is 0.462 and based on this, the maximum flow on each circuit should not exceed 228 MW.

D. 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 is limited to 1200 MW via the Chateauguay – Massena 765kV circuit MSC-7040. Maximum delivery from NYCA to TE is 1000 MW.

5. SUMMARY OF RESULTS
TRANSFER LIMIT ANALYSIS

TABLE 1

NYISO CROSS STATE INTERFACE THERMAL LIMITS-SUMMER 2004
ALL LINES I/S

	Dysinger East	West Central	UPNY-ConEd	Sprain Brook Dunwoodie So.	ConEd-LIPA
NORMAL	2950(1)	1700(1)	3400(3)	3775(4)	900(6)
EMERGENCY	3200(2)	1950(2)	4050(3)	3950(5)	1400(7)

	LIMITING ELEMENT				LIMITING CONTINGENCY
(1)	Niagara – Rochester (NR2) 345kV	@LTE	1501 MW	L/O	AES/Somerset – Rochester (SR-1) 345kV
(2)	Stolle - Meyer230kV	@NOR	430 MW		Pre-contingency Loading
(3)	Leeds – Pleasant Valley (92) 345kV	@LTE @STE	1538 MW 1724 MW	L/O	Athens – Pleasant Valley (91) 345kV
(4)	Sprain Brook – W. 49th St. 345kV	@SCUC	1078MW	L/O	(Breaker failure @ Sprainbrook 345kV) Sprain Brook – W. 49th St. 345kV Sprainbrook S6 345/138 kV
(5)	Sprain Brook – W. 49th St. 345kV	@NOR	774 MW		Pre-contingency Loading
(6)	Dunwoodie – Shore Rd. (Y50) 345kV	@LTE	877 MW	L/O	Sprain Brook East Garden City(Y49)345kV
(7)	Dunwoodie – Shore Rd. (Y50) 345kV	@NOR	599 MW		Pre-contingency Loading

NOTE: Some transfers may be voltage/stability limited. See Appendix I for existing transient stability limits.

SCUC Rating is the average of the LTE and STE rating and is consistent with the ratings used in the NYISO Day-Ahead Market process.

TABLE 1.a

NYISO CROSS STATE INTERFACE THERMAL LIMITS-SUMMER 2004
ALL LINES I/S

	MSC-7040 FLOW 800 MW	MSC-7040 FLOW 1200 MW	MSC-7040 FLOW 1600 MW
CENTRAL EAST			
NORMAL	2950(1)	2975(2)	3000(2)
EMERGENCY	3275(2)	3275(2)	3300(2)
TOTAL EAST			
NORMAL	5175(1)	5075(2)	5000(2)
EMERGENCY	5825(2)	5700(2)	5625(2)
MOSES SOUTH			
NORMAL	1950(3)	2125(3)	2300(3)
EMERGENCY	2250(4)	2550(4)	2875(4)

	LIMITING ELEMENT				LIMITING CONTINGENCY
(1)	Fraser – Coopers Corners 345kV	@LTE	1404 MW	L/O	Marcy – Coopers Corners (UCC2-41) 345kV Porter – Rotterdam 230kV
(2)	New Scotland – Leeds (93) 345kV	@LTE @STE	1538 MW 1724MW	L/O	New Scotland – Leeds (94) 345kV
(3)	Adirondack – Porter 230kV	@LTE	353 MW	L/O	(Breaker failure @ Porter 230kV) Adirondack - Porter 230kV Edic 345/230kV Edic 345/115kV
(4)	Brown Falls – Taylorville 115kV	@STE	134 MW	L/O	Chateauguay – Massena (MSC-7040) 765 kV Massena – Marcy (MSU-1) 765 kV and TransÉnergie delivery

NOTE: Some transfers may be voltage/stability limited. See Appendix I for existing transient stability limits.

TABLE 2.a

NYISO to ISO-NE INTERFACE LIMITS - SUMMER 2004
ALL LINES I/S

New York to New England		**Northport – Norwalk @ 100MW**	
	DIRECT TIE	NYISO FACILITY	ISO-NE FACILITY
NORMAL	600[(1)]	1350[(2)]	1875[(3)]
EMERGENCY	1425[(4)]	1550[(5)]	1875[(3)]
		Northport – Norwalk @ 0 MW	
NORMAL	975[(1)]	1700[(2)]	1825[(3)]
EMERGENCY	1800[(4)]	1900[(5)]	1825[(3)]

	LIMITING ELEMENT				**LIMITING CONTINGENCY**
(1)	Norwalk Harbor - Northport (1385) 138kV	@LTE	318MW	L/O	(Breaker failure @Long Mountain 345kV) Long Mountain - Plumtree 345kV Long Mountain – Plea. Valley (398) 345kV
(2)	Northport - Northport (PAR) 138kV	@LTE	450MW	L/O	(Breaker failure @Long Mountain 345kV) Long Mountain - Plumtree 345kV Long Mountain – Plea. Valley (398) 345kV
(3)	Coolidge-Ascutney (K31) 115 kV	@STE	217MW	L/O	Northfield-Ludlow (354) 345 kV
(4)	Norwalk Harbor - Northport (1385) 138kV	@STE	428MW	L/O	Long Mountain 398 -Pleasant Valley 345 kV
(5)	Northport - Northport (PAR) 138kV	@STE	450MW	L/O	Long Mountain 398 -Pleasant Valley 345 kV

Note: Northport – Norwalk Harbor flow is positive in the direction of transfer.

TABLE 2.b

ISO-NE to NYISO INTERFACE LIMITS - SUMMER 2004
ALL LINES I/S

New England to New York	**Norwalk – Northport @ 100MW**		
	DIRECT TIE	NYISO FACILITY	ISO-NE FACILITY
NORMAL	1150[(2)]		1050[(6)]
EMERGENCY	1375[(1)]	2025[(5)]	1100[(4)]

	Norwalk – Northport @ 200MW		
NORMAL	1175[(2)]		1100[(6)]
EMERGENCY	1425[(1)]	2050[(5)]	1150[(4)]

.

	LIMITING ELEMENT				**LIMITING CONTINGENCY**
(1)	Whitehall – Blissville 115kV	@STE	239 MW	L/O	Alps – Berkshire (393) 345kV Berkshire 345/115kV
(2)	Whitehall – Blissville 115kV	@LTE	239 MW	L/O	(Breaker failure @ NRTFLD2T) Berkshire - Northfield (312) 345kV Berkshire 345/115kV Northfield - Alps 345kV
(4)	Southington – Todd (1910) 115kV	@STE	306 MW	L/O	Southington – Frost Bridge (329) 345kV
(5)	N.Troy -Hoosick 115kV	@STE	159 MW	L/O	Alps – Berkshire (393) 345kV
(6)	Southington-Todd (1910) 115 kV	@STE	306 MW	L/O	Southington-Frost Bridge (329) 345 kV + Southington (3X) 345/115 kV Xf (Stuck Southington 5T Bkr)

Note: Norwalk Harbor – Northport cable schedule is positive in the direction of transfer

TABLE 3.a

PJM to NYISO INTERFACE LIMITS-SUMMER 2004
ALL LINES I/S

PJM to NYISO	DIRECT TIE	NYISO FACILITY	PJM FACILITY
NORMAL	1525 (1)		2575 (3)
3-115-O/S	2625 (4)	2950 (8)	2650 (5)
EMERGENCY	1750 (1)		2900 (7)
3-115-O/S	2700 (4)	3175 (8)	3025 (7)

	LIMITING ELEMENT				LIMITING CONTINGENCY
(1)	Warren-Falconer (171) 115kV	@LTE @STE	120MW 136MW	L/O	Forest – Glade TP 230kV Glade TP- Glade 230kV
(3)	Oxbow – Lackawanna 230kV	@LTE	504MW	L/O	Homer City - Watercure (30) 345kV
(4)	E. Towanda-Hillside (70) 230kV	@LTE @STE	531MW 554MW	L/O	Homer City - Watercure (30) 345kV
(5)	Oxbow – Lackawanna 230kV	@LTE	504MW	L/O	Moshan - Grover 230kV
(7)	Oxbow – Lackawanna 230kV	@NOR	499MW		Pre- Contingency Loading
(8)	Oakdale 230/115kV	@LTE @STE	400MW 440MW	L/O	Oakdale - Watercure (31) 345kV

NOTE: Emergency Transfer Limits may require line outages as described in Section 4.III. PAR schedules have been optimized for the emergency limits as described in Appendix B. Some transfers may be stability limited. See Appendix I for existing transient stability limits.

TABLE 3.b

NYISO to PJM INTERFACE LIMITS-SUMMER 2004
ALL LINES I/S

NYISO to PJM	DIRECT TIE	NYISO FACILITY	PJM FACILITY
NORMAL	1975(1)	2500(6)	2325(3)
3-115-O/S	2375(4)	2525(2)	2250(3)
EMERGENCY	2050(7)	2775(9)	2600(8)
3-115-O/S	2375(4)	2625(5)	2375(8)

	LIMITING ELEMENT				LIMITING CONTINGENCY
(1)	E. Sayre - N. Waverly 115kV	@LTE	124MW	L/O	E.Towanda – Hillside 230kV Grover – E.Towanda 230kV E.Towanda 230/115kV
(2)	Dunkirk - S Ripley 230kV	@LTE	530MW	L/O	Meyer– Stolle 230kV Homer City - Stolle 345 kV
(3)	Homer City 345/230 kV	@LTE	699MW	L/O	Homer City 345/230 kV
(4)	S Ripley – Erie E 230kV	@NOR	499MW		Pre-Contingency Loading
(5)	Dunkirk - S Ripley 230kV	@NOR	482MW		Pre-Contingency Loading
(6)	Goudey – Oakdale 115kV	@LTE	239MW	L/O	Meyer – Hillside 230kV Hillside – Watercure 230kV
(7)	E. Sayre - N. Waverly 115kV	@STE	124MW	L/O	E.Towanda – Hillside 230kV
(8)	Erie E - Erie SE 230kV	@NOR	477MW		Pre-Contingency Loading
(9)	Goudey – Oakdale 115kV	@STE	239MW	L/O	Hillside – Watercure 230kV

NOTE: Emergency Transfer Capability Limits may have required line outages as described in Section 4.III. PAR schedules have been optimized for the emergency limits as described in Appendix B. Some transfers may be stability limited. See Appendix I for existing transient

TABLE 4

NYISO- IMO INTERFACE LIMITS - SUMMER 2004
ALL LINES I/S

Ontario to New York	**L33/34P @ 0 MW**			**L33/34P @ 400 MW**		
	DIRECT TIE	NYISO FACILITY	IMO FACILITY	DIRECT TIE	NYISO FACILITY	IMO FACILITY
NORMAL	1975(1)	1050(2)	1075(3)	2350(1)	1500(2)	1375(3)
EMERGENCY	2325(1)	1450(2)	1875(4)	2700(1)	1900(2)	2175(4)

New York to Ontario	**L33/L34P @ 0 MW**			**L33/34P @ 200 MW**		
	DIRECT TIE	NYISO FACILITY	IMO FACILITY	DIRECT TIE	NYISO FACILITY	IMO FACILITY
NORMAL	1325(5)		950(8)	1525(5)		1175(8)
EMERGENCY	1525(6)		1500(7)	1700(6)		1725(7)

	LIMITING ELEMENT				**LIMITING CONTINGENCY**
(1)	Beck – Niagara (PA27) 230kV	@LTE @STE	460 MW 558 MW	L/O	Beck2 DK – Beck2 PA2 220kV
(2)	Niagara – Rochester (NR-2) 345kV	@LTE @STE	1501 MW 1685 MW	L/O	AES/Somerset - Rochester (SR-1) 345kV
(3)	MiddlDK2 - Neal JQ25 220kV	@LTE	521 MW	L/O	Beck -Hannon - MiddlDK2 Q24HM 220kV Burlington- Neal - MiddlDK2 Q23BM 220kV
(4)	MiddlDK2 - Neal JQ23 220kV	@LTE	479MW	L/O	Burlington- Neal - MiddlDK2 Q25BM 220kV
(5)	Beck – Niagara (PA27) 230kV	@LTE	460 MW	L/O	(Breaker failure @ Niagara 345kV) Beck - Niagara (PA301) 345kV Niagara 345/230kV
(6)	Beck – Niagara (PA27) 230kV	@NOR	400 MW		Pre- Contingency Loading
(7)	Burlington J23 - Neal JQ23 220kV	@NOR	483 MW		Pre- Contingency Loading
(8)	Burlington J23 - Neal JQ23 220	@LTE	582 MW	L/O	Burlington- Neal - MiddlDK2 Q25BM 220kV Beck- Hannon- MiddlDK1 Q29HM 220kV

NOTE: Some transfers may be stability limited. See Appendix I for existing transient stability limits.