NYISO OPERATING STUDY
SUMMER 2003

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NYISO OPERATING STUDY - SUMMER 2003

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 2003 capability period. This analysis indicates that, for the Summer 2003 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.

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.

2. RECOMMENDATIONS

The following recommendations are presented based on the analysis and results documented in this report.

1) 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.

2) Installed Capacity (ICAP) resources of 37,087 MW are anticipated to be adequate to meet the forecast peak demand of 31,430 MW. Based on the Load and Capacity assessment, the NYISO will have adequate operating reserve during the peak load period.

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 31,430 MW. The other NPCC members and adjacent regions representations were obtained from MEN/VEM Summer 2003 Reliability Assessment power flow.

For the Summer 2003 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 2003 Reliability Assessment.

Significant changes in the NYISO system since the Summer 2002 capability period include:

Northport 1385 PAR (upgrade) **In service November, 2002**

New facilities represented in this study include:

Cross-Sound Cable **Available for emergency service**
Bowline Point 345/138kV Transformer **In service 06/2003**

NEG/Athens Station (1080MW) **Full capability anticipated 07/2003**

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. The facility completed testing during Summer 2002, and may be available for emergency operation during the summer 2003 capability period. Commercial operation of this facility is still pending resolution of regulatory issues.

II. Base Study Assumptions

The Normal and Emergency Criteria thermal limits have been determined by the PTI MUST thermal transfer analysis program and PSS/e Power Flow. The thermal limits presented have been determined for all transmission facilities scheduled in service during the Summer 2003 period.

The schedules used in the base case loadflows for this analysis assumed a net 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 2003, and the NERC/MMWG Summer 2003 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 2003 capability period is 31,430 MW. This forecast is approximately 1.0% above the forecast for Summer 2002 capability period, and 1.02% 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 37,087 MW, based on the NYSRC 18% reserve requirement, is anticipated to be adequate to meet forecast demand.

NYISO Peak Load and Capacity Assessment – Summer 2003

NYISO ICAP Requirement	37087
Net of full-responsibility purchases/sales	0
Scheduled generation outages	0
Allowance for unplanned outages	3857
Net capacity for load	33230
NYISO Forecast Peak	31430
Operating Reserve Requirement	1800
Available Reserve	***1800***
Net Margin	0

The assumed allowance for unplanned outages is an equivalent forced outage rate of 10.4% and includes forced outages and de-ratings based on historical performance of all generation in the New York control area. For Summer 2002 the equivalent forced outage rate assumed was 10.8%.

The NYISO load forecast for 2003 is 955MW higher than the forecast for 2002. Based on the forecast load and assumed outage rates, the NYISO will have sufficient resources to meet its reserve requirement for the season peak.

New combustion turbine capacity represented in the LIPA service area includes the following sites:

FPL, Far Rockaway	52 MW
Calpine, Stony Brook	47 MW

These units are anticipated to be available for service prior to, or during, the Summer peak load period (July 1 – September 1, 2003)

II. Cross-State Interfaces

A. Transfer Limit Analysis

Figure 1 presents a comparison of the Summer 2003 thermal transfer limits to Summer 2002. 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 2003 and 2002, with limiting element/contingency descriptions. Significant differences in these thermal transfer limits are discussed below.

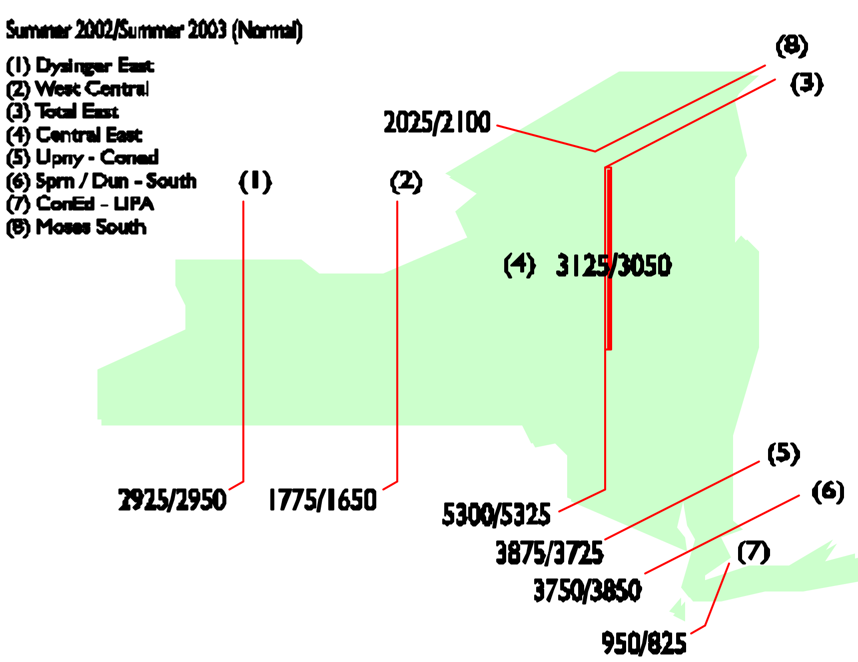

Figure 1 – Cross-State Thermal Transfer Limits

- ***Central East*** thermal transfer limits decreased 75 MW from last summer. The decrease in Central East limit is primarily due to the representation of 360 MW of generation at Athens in the summer 2003 base case. This does not result in decreased overall transfer capability, as this interface will continue to be limited by voltage and stability performance.

- ***UPNY – ConEd*** interface limit has decreased 150 MW, due to changes in the base case dispatch, including representation of 360 MW at Athens, and the slight increase in the impedance of the Leeds-Athens-Pleasant Valley #95/91 circuits resulting in slightly higher loading of the Leeds-Pleasant Valley circuit #92.

- ***Sprain Brook/Dunwoodie – South*** interface limit has increased 100MW. The Summer 2003 limit is 3850MW- Sprain Brook – West 49^{th} Street 345kV circuit for loss of Sprain Brook – West 49^{th} Street 345kV and Sprain Brook 345/138kV (breaker failure). The change is due to an increase (about 90 MW) in the Summer 2003 base case loading of the Sprain Brook – W. 49^{th} circuits caused by generation schedules at Ravenswood, and Poletti units.

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	-200MW	0MW
Jamaica – Valley Stream 138kV	-55MW	215MW
Sprain Brook – E. Garden City 345kV	505MW	637MW
Norwalk Harbor – Northport 138kV	200MW	200MW

Dunwoodie – Shore Road 345kV circuit Y50 was returned in-service during the Winter 2002-2003 and is represented in service in the Summer 2003 base case and for transfer limit analysis (ConEd – LIPA and New York – New England) into the Long Island load zone.

Norwalk Harbor – Northport 138kV circuit 1385 – A new Northport PAR with an increased angle capability was placed in service during the Winter 2002-03 capability period. With the increased range of control, the problem of unscheduled power flow on the Norwalk Harbor – Northport 138kV circuit due to angle limitations at Northport should not be an issue. This generally occurred during periods with low generation on Long Island and high generation in southwest Connecticut.

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.

G. UPNY-ConEd Sensitivity to Athens Generation

New generation at the Athens site is expected to be in service during the Summer 2003 peak period. Athens Generation connects directly to the Leeds – Pleasant Valley

345kV #91 circuit at the Athens 345kV station; creating the Leeds – Athens #95 and Athens – Pleasant Valley #91 circuits. The chart on page G-7 in Appendix G demonstrates the relationship between generation at Athens and the UPNY – ConEd transfers as limited by the Leeds – Pleasant Valley 345kV transmission path.

III. Thermal Transfer Capabilities with Adjacent Control Areas

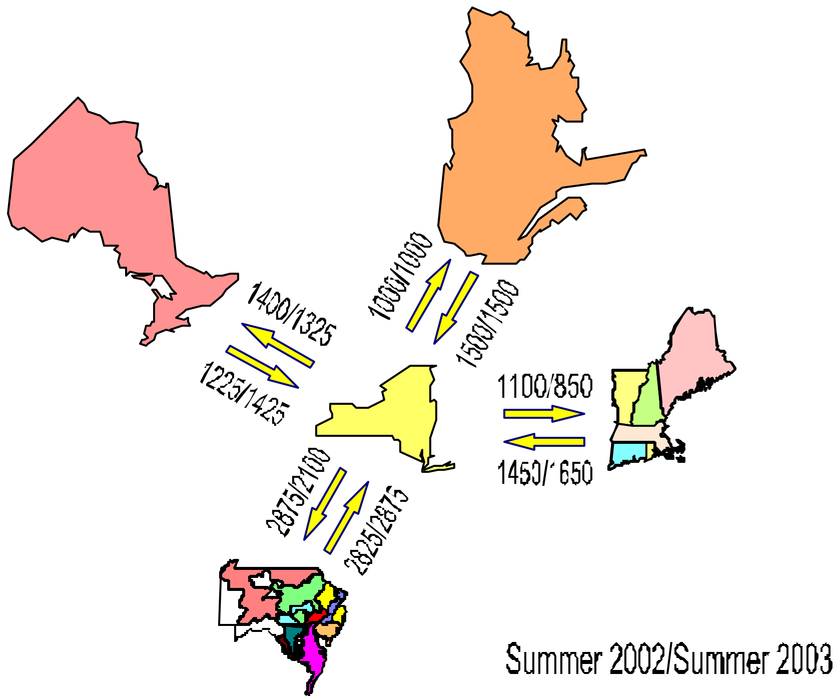

Figure 2 – Inter-Area Thermal Transfer Capabilities

A. New York – ISO New England Analysis

1. New England Transmission/Capacity Additions

Transmission

In the New England Control Area, the Coolidge – West Rutland 115 kV transmission path in Vermont is now operated at 345 kV as of the end of March 2003. A 345/115 kV transformer is also in service at West Rutland. A second 345/115 kV transformer is expected to be installed at West Rutland during the Summer of 2003.

Capacity

In the New England Control Area, from September 2002 through January 2003, an additional 1720 MW of capacity has been added. An additional 3100 MW (summer capability) of new capacity is expected to be in service prior to the start of the Summer 2003 capability period. During the Summer 2003 period, an additional 500 MW of capacity may become available. Since the beginning of the previous summer (2002) capability period, the following new generation has become available or is expected to be available:

Lake Road 3	250 MW
Waterside	70 MW
W. Springfield 1-2	100 MW
Newington	520 MW
Bellingham 1	250 MW
Granite Ridge	750 MW
Kendall	180 MW
Bellingham 2	250 MW
Mystic 8	750 MW
Rise	520 MW
Mystic 9	750 MW
Fore River	750 MW
GLHA	100 MW

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 as a result of Athens generation.

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 ISONE to NYISO transfers 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 NYISO-ISONE transfers.

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. <u>Plattsburgh – Sandbar (PV-20) Circuit</u>

A new phase angle regulating transformer controlling the Plattsburgh, NY, to Sandbar, VT, 115kV circuit (PV-20) was placed in service in February 2001 and normal operating procedures have been restored.

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 2002 in Figure 2 shows a decrease of 700 MW from New York to PJM. This change is primarily due to changes in the summer 2003 base case dispatch in PJM, resulting in slightly higher pre transfer loading on the tie lines and consequently a shift in the limiting element. The interface was limited by E. Towanda - Hill Side 230kV in summer 2002, and by S.Ripley – E. Erie 230kV in summer 2003.

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 limit has decreased 75 MW, and Ontario to New York limit has increased 200 MW. Both are due to changes in the base case dispatch of the Ontario generation and generation in Western NY.

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:

Waterman – Keith 230kV	J5D
Lambton – St. Clair 345kV	L4D
Lambton – St. Clair 230kV	L51D
Scott – Bunce Creek 230kV	B3N

The PARs for the L4D and L51D are expected to be available for service during the Summer 2003. The PAR for the B3N circuit was forced out of service in March, 2003, and is not expected to return prior to the summer peak period.

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. These SPSs can be selected by Ontario or NYPA operators consistent with system conditions.

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 2003
ALL LINES I/S

	Dysinger East	West Central	UPNY-ConEd	Sprain Brook Dunwoodie So.	ConEd-LIPA
NORMAL	2950(1)	1650(1)	3725(3)	3850(4)	825(6)
EMERGENCY	3225(2)	1950(2)	4375(3)	4000(5)	1450(6)

	LIMITING ELEMENT				LIMITING CONTINGENCY
(1)	Niagara – Rochester (NR2) 345kV	@LTE	1501 MW	L/O	AES/Somerset – Rochester (SR-1) 345kV
(2)	Meyer – Stole 230kV	@NOR	430 MW		Pre-contingency
(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	Sprain Brook – W. 49th St. 345kV
(5)	Sprain Brook – W. 49th St. 345kV	@NOR	774 MW		Pre-contingency Loading
(6)	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 2003
ALL LINES I/S

	MSC-7040 FLOW 800 MW	**MSC-7040 FLOW 1200 MW**	**MSC-7040 FLOW 1600 MW**
CENTRAL EAST			
NORMAL	3000(1)	3050(1)	3125(2)
EMERGENCY	3400(2)	3425(2)	3450(2)
TOTAL EAST			
NORMAL	5325(1)	5325(1)	5375(2)
EMERGENCY	6150(2)	6075(2)	6025(2)
MOSES SOUTH			
NORMAL	1925(3)	2100(3)	2275(3)
EMERGENCY	2250(4)	2575(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 2003
ALL LINES I/S

New York to New England		**Northport – Norwalk @ 100MW**	
	DIRECT TIE	NYISO FACILITY	ISO-NE FACILITY
NORMAL	850 (1)	1650 (2)	2375 (3)
EMERGENCY	1625 (4)	2200 (2)	2375 (3)

		Northport – Norwalk @ 0 MW	
NORMAL	1225 (1)	1600 (2)	2250 (3)
EMERGENCY	2000 (4)	2125 (2)	2250 (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)	Greenbush – Reynolds Rd. (9) 115kV	@LTE @STE	197MW 248MW	L/O	New Scotland – Alps (2) 345kV
(3)	Stony Hill – W.Brookfield (1887) 115 kV	@STE	146MW	L/O	Frost Bridge – Long Mountain (352) 345 kV Frost Bridge 345/115 kV (1X) Xf
(4)	Norwalk Harbor - Northport (1385) 138kV	@STE	428MW	L/O	Long Mountain 398 -Pleasant Valley 345

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

TABLE 2.b

ISO-NE to NYISO INTERFACE LIMITS - SUMMER 2003
ALL LINES I/S

New England to New York	**Norwalk – Northport @ 100MW**		
	DIRECT TIE	NYISO FACILITY	ISO-NE FACILITY
NORMAL	1200(2)	1250(5)	950(6)
EMERGENCY	1650(2)	1825(3)	1150(4)
	Norwalk – Northport @ 200MW		
NORMAL	1200(1)	1350(5)	975(6)
EMERGENCY	1675(2)	1900(3)	1200(4)

.

	LIMITING ELEMENT				**LIMITING CONTINGENCY**
(1)	Norwalk Harbor – Northport 138kV	@LTE	318 MW	L/O	Long Mountain (398) -Pleasant Valley 345kV
(2)	Whitehall – Blissville	@LTE @STE	197 MW 239 MW	L/O	Alps – Berkshire - Northfield (393) 345kV Berkshire 345/115kV
3)	Leeds – Pleasant Valley 345kV	@STE	1724MW	L/O	Athens - Pleasant Valley 345kV
(4)	Southington – Canal (1910) 115kV	@STE	306MW	L/O	Southington – Frost Bridge (329) 345kV
(5)	Leeds – New Scotland1 345	@LTE	1538MW	L/O	Leeds – New Scotland2 345
(6)	Southington – Canal (1910) 115 kV	@STE	306 MW	L/O	Southington – Frost Bridge (329) 345 kV Southington 345/115 kV (3X) 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 2003
ALL LINES I/S

PJM to NYISO	DIRECT TIE	NYISO FACILITY	PJM FACILITY
NORMAL	2100(1)		2400(2)
3-115-O/S	2875(3)	3275(5)	2925(4)
EMERGENCY	2100(1)		3125(6)
3-115-O/S	2950(3)	3525(5)	3300(6)

	LIMITING ELEMENT				LIMITING CONTINGENCY
(1)	Warren-Falconer (171) 115kV	@NOR	82MW		Pre- Contingency
(2)	Towanda – E.Sayre 115kV	@LTE	159MW	L/O	Avoca – Hillside 230kv Hillside – Watercure 230kv Hillside 230/345 kv E. Towanda – Hillside 230kV
(3)	E. Towanda-Hillside (70) 230kV	@LTE @STE	531MW 554MW	L/O	Homer City - Watercure (30) 345kV
(4)	Oxbow – Lackawanna 230kV	@LTE	504MW	L/O	Grover – E. Towanda 230kV Grover – Moshannan 230kV Grover 230/34.5 kV
(5)	Hillside – Watercure 230kv	@LTE @STE	504MW 657MW	L/O	Homer City - Watercure 345kV
(6)	Oxbow – Lackawanna 230kV	@NOR	499MW	L/O	Pre- Contingency

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 2003
ALL LINES I/S

NYISO to PJM	DIRECT TIE	NYISO FACILITY	PJM FACILITY
NORMAL	1625(1)	2525(2)	1775(3)
3-115-O/S	2100(4)	2200(2)	1675(3)
EMERGENCY	1625(1)	2650(6)	1975(5)
3-115-O/S	2100(4)	2350(6)	1875(5)

	LIMITING ELEMENT				LIMITING CONTINGENCY
(1)	E. Sayre - N. Waverly 115kV	@LTE	124MW	L/O	E. Towanda – Grover 230 kV E. Towanda - Hillside 230 kV Towanda – E. Towanda 115/230 kV
(2)	Dunkirk - S Ripley 230kV	@LTE	530MW	L/O	Wayne – Handsome Lake 345kV
(3)	Homer City 345/230 kV	@LTE	733MW	L/O	Homer City 230/345 kV
(4)	S Ripley – E Erie 230kV	@NOR	499MW		Pre-Contingency Loading
(5)	Homer City – Shelocta 230 kV	@NOR	694MW		Pre-Contingency Loading
(6)	Dunkirk - S Ripley 230kV	@NOR	482MW		Pre-Contingency Loading

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 2003
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)]	950[(2)]	1850[(3)]	2350[(1)]	1425[(2)]	2250[(3)]
EMERGENCY	2325[(1)]	1350[(2)]	2225[(4)]	2700[(1)]	1800[(2)]	2600[(4)]
New York to Ontario	**L33/L34P @ 0 MW**			**L33/34P @ 200 MW**		
NORMAL	1325[(5)]		1225[(8)]	1525[(5)]		1425[(8)]
EMERGENCY	1525[(6)]		1750[(7)]	1725[(6)]		1950[(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)	Allan JQ30– Middleport 220kV	@LTE	459 MW	L/O	Beck-Hannon-Nebo-Middleport (Q24HM) 220kV
(4)	Allan JQ30– Middleport 220kV	@NOR	393MW		Beck-Hannon-Nebo-Middleport (Q29HM) 220kV
(5)	Beck – Niagara (PA27) 230kV	@LTE	460 MW	L/O	Pre- Contingency (Breaker failure @ Niagara 345kV) Beck - Niagara (PA301) 345kV Niagara 345/230kV
(6)	Beck – Niagara (PA27) 230kV	@NOR	400 MW		Pre- Contingency
(7)	Beck – HanonJ24 220kV	@NOR	512 MW		Pre- Contingency
(8)	Beck – HanonJ24 220kV	@LTE	623 MW	L/O	Beck-Hannon-Nebo-Middleport (Q25HM) 220kV Beck-Hannon-Nebo-Middleport (Q29HM) 220kV

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