Available Transfer Capability Implementation Document
ATC ID

Introduction:
The ISO calculates and posts Available Transfer Capability in the manner described in Attachment C to its Open Access Transmission Tariff. This ATCID provides information describing the process specifically on the ATC calculation portion. This document was developed to comply with North American Energy Standards Board (NAESB) Wholesale Electric Quadrant (WEQ) Standard WEQ-023.

Overview:

Methodology

The ISO shall calculate Firm Available Transfer Capability ("ATC") according to the procedures set forth in its Attachment C which adopts the "Rated System Path Methodology" established by the NAESB Standard WEQ-023, or its successor. The ISO employs a "financial reservation" transmission model that has been approved by the Federal Energy Regulatory Commission ("Commission") and that differs significantly from the "physical reservation" model envisioned by the Commission's *pro forma* Open Access Transmission Tariff. Certain services and concepts that exist in the *pro forma* model, and that are accounted for in the WEQ-023 methodology, do not exist in the NYISO model. Certain variables in the WEQ-023algorithm will therefore normally have zero values in the NYISO's calculations. Additional information concerning these differences is set forth in this ATCID.

The ISO shall calculate and post ATC values for its Internal and External Interfaces and for Scheduled Lines. The ISO's Interfaces represent a defined set of transmission facilities that separate Locational Based Marginal Pricing (LBMP) Load Zones within the New York Control Area and that separate the New York Control Area from adjacent Control Areas. External Interfaces may be represented by one or more Proxy Generator Buses for scheduling and dispatching purposes. Each Proxy Generator Bus may be associated with distinct, posted ATC values. Scheduled Lines represent a transmission facility or set of transmission facilities that provide a separate scheduling path interconnecting the ISO to an adjacent Control Area. Each Scheduled Line is associated with a distinct Proxy Generator bus for which the ISO separately posts ATC.

The ISO also calculates Firm ATC based on the market schedules determined using its Security Constrained Unit Commitment ("SCUC") process for the Day-Ahead Market and its Real-Time Commitment ("RTC") and Real-Time Dispatch ("RTD") (together, "Real-Time Scheduling" ("RTS")) process for the Real-Time Market. These Firm ATC values shall be posted after the close of the Day-Ahead Market and Real-Time Market for all Interfaces and Scheduled Lines. When calculating Firm ATC ("$\mathbf{ATC_F}$") for an Interface for a specified period, the ISO shall use the algorithm established under Requirement 2.2.5 of WEQ-023. Specifically:

$$\mathbf{ATC_F} = \mathbf{TTC} - \mathbf{ETC_F} - \mathbf{CBM} - \mathbf{TRM} + \mathbf{Postbacks_F} + \mathbf{counterflows_F}$$

Where:

ATC_F is the firm Available Transfer Capability for the Interface for that period.
TTC is the Total Transfer Capability of the Interface for that period.
ETC_F is the sum of existing firm commitments for the Interface during that period (including Firm Transmission Flow Utilization).
CBM is the Capacity Benefit Margin for the Interface during that period.
TRM is the Transmission Reliability Margin for the Interface during that period.
$Postbacks_F$ are changes to firm Available Transfer Capability due to a change in the use of Transmission Service for that period, as defined in Business Practices.
$counterflows_F$ are the adjustments to ATC_F as determined by the ISO

The ISO shall calculate ETC for firm Existing Transmission Commitments (**ETC_F**) for a specified period for an Interface, using the formula established under Requirement 2.2.3 of WEQ-023. Specifically:

$$ETC_F = NL_F + NITS_F + GF_F + PTP_F + ROR_F + OS_F$$

Where:

NL_F is the firm capacity set aside to serve peak Native Load forecast commitments for the time period being calculated, to include losses, and Native Load growth, not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin.
$NITS_F$ is the firm capacity reserved for Network Integration Transmission Service serving Load, to include losses, and Load growth, not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin.
GF_F is the firm capacity set aside for grandfathered Transmission Service and contracts for energy and/or Transmission Service, where executed prior to the effective date of a Transmission Service Provider's Open Access Transmission Tariff or "safe harbor tariff."
PTP_F is the firm capacity reserved for confirmed Point-to-Point Transmission Service.
ROR_F is the firm capacity reserved for Roll-over rights for contracts granting Transmission Customers the right of first refusal to take or continue to take Transmission Service when the Transmission Customer's Transmission Service contract expires or is eligible for renewal.
OS_F is the firm capacity reserved for any other service(s), contract(s), or agreement(s) not specified above using Firm Transmission Service

OS_F shall include a Transmission Flow Utilization value which shall be based on the market schedules determined using the SCUC and RTS market software, consistent with N WEQ-023. The Day-Ahead Market and Real-Time Market schedules established by the market software are security constrained network powerflow solutions that are used to determine the Transmission Flow Utilization value for the ISO's Interfaces and Scheduled Lines. Thus:

Transmission Flow Utilization$_{Firm}$ for each Scheduled Line, Internal and External Interface is determined by the corresponding security constrained network powerflow solutions of SCUC or RTS, as applicable.

Additional Modeling Details

Counterflows
The value for the **counterflows**$_{F}$ variables will be zero in the ISO's firm ATC calculations. The rationale for this accounting is that the SCUC and RTS evaluations consider the impact of counterflows in the determination of *Transmission Flow Utilization*$_{Firm}$ which is the **OS**$_{F}$ term in the **ETC**$_{F}$).

Postbacks
The ISO's financial reservation-based transmission system does not provide for "redirects" of physical transmission reservations in the manner contemplated by the Commission's *pro forma* Open Access Transmission Tariff. It therefore does not support "postbacks" of such "redirects." For that reason, the ISO has previously obtained waivers of North American Energy Standard Board standards governing both redirects and postbacks. The ISO therefore does not have postbacks of redirected services to incorporate into its ATC calculations. Accordingly, the **postbacks**$_{F}$ variables will normally have zero values in the ISO's ATC calculations.

Native Load
The SCUC and RTS consider the impact of transmission service for all load in the New York Control Area. The ISO is not an LSE. It therefore does not serve Native Load as that term is defined in the NERC Glossary and does not distinguish between Native Load and other loads in calculating ATC.

Network Integration Transmission Service
A financial reservation-based form of Network Integration Transmission Service is described in the ISO's Open Access Transmission Tariff. Nevertheless, given the nature of the ISO's financial reservation-based transmission model service, no market participant has ever requested Network Integration Transmission Service. The ISO does not anticipate receiving requests for the service in the future.

Grandfathered Transmission Service
The ISO assigns zero values to the **GF**$_{F}$ terms in the firm ATC calculations.

Point-to-Point Transmission Service
The ISO's financial reservation transmission model does not have physical point-to-point transmission service reservations.

Rollover Rights
The ISO's Commission-approved Open Access Transmission Tariff ("OATT") does not include a rollover rights provision. Accordingly, the ISO does not track **ROR_F**.

Entities Providing Data for ATC Calculations
The ISO is registered as both the Transmission Operator and the Transmission Service Provider for the New York Control Area. The ISO also receives data from other TOPs and TSPs which include PJM Interconnection, LLC, ISO-NE, Hydro-Quebec TransEnergie, Ontario IESO, and Niagara Mohawk Power Corporation.

Entities Receiving Data from ATC Calculations
The ISO is registered as both the Transmission Operator and the Transmission Service Provider for the New York Control Area. The ISO also provides data from other TOPs and TSPs which include PJM Interconnection, LLC, ISO-NE, Hydro-Quebec TransEnergie, Ontario IESO, and Niagara Mohawk Power Corporation.

Allocation process
The interfaces in the New York Control Area that are calculated and posted are not multiple paths and do not have multiple owners. There is no allocation of the transfers.

PAR Modeling
The ISO models PARs as regulating to a desired flow. For PARs that are internal to the New York State Power System, the PARs would regulate to a flow that helps relieve congestion. For PARs that are on tie lines between the ISO and other Control Areas, the PARs are set to regulate to schedule.

<u>DAM & RTM – ATC Posting</u>

ATC shall be calculated and posted after the close of the ISO's Day-Ahead Market and Real-Time Market for all Internal and External Interfaces and for Scheduled Lines. The ATCs calculated for the DAM and RTM are posted at
http://mis.nyiso.com/public/P-8list.htm
[select desired date]

Two Day to Thirteen Months – ATC Posting

ATC is also posted two days to thirteen months in advance of the Dispatch Day at External Interfaces. The ATCs calculated for two days to thirteen months in advance of the Dispatch Day are posted at
http://mis.nyiso.com/public/P-8Alist.htm
[select desired date]

The ISO's calculation of ATC shall reflect its provision of transmission service under an LBMP system and the schedules produced by its Day-Ahead Market and Real-Time Market software. The ISO shall not limit Transmission Customers' ability to schedule Firm Transmission Service across Internal Interfaces based on ATC values. If the posted ATC value for an Interface is zero that is an indication that the Interface is congested. The ISO may, however, still be able to provide additional Firm Transmission Service over Internal Interfaces for Transmission Customers that are willing to pay congestion charges by redispatching the New York State Power System.

Current TTC Development

The TTCs used by the ISO in the scheduling systems are determined based on the type of facility and its location in the power system. The interface TTCs are determined based on facility capabilities, stability and voltage limitations and thermal limitations. Interface net transaction totals are limited to less than or equal to the sum of the individual facility ratings.

For TTC interfaces that are scheduled by controllable facilities, the capabilities of these facilities typically determine the limitations. Since these TTCs are a function of physical facility capabilities, these TTC are not expected to be reevaluated unless a change is made to the controlling device. The table below contains a list of these facilities and their associated limitations. While the ISO calculates and posts ATC on these ATC paths, the ISO is not the Transmission Service Provider for them.

ISO Posted Interfaces	Facility Limits (TTC)
NPX-CSC	330 MWs
CSC-NPX	330 MWs
PJM-NEPTUNE	660 MWs
PJM-VFT	315 MWs
VFT-PJM	315 MWs
PJM-HTP	660 MWs

Some TTC interfaces are scheduled by controllable facilities but still have thermal limitations due to their location and connections in the power system. These interconnections have a relatively small region of the power system that would affect the transfer levels and are therefore the limits are static. The table below contains a list of these facilities and their associated limitations.

ISO Posted Interfaces	Interface Limits (TTC)
HQ-NYISO	1500 MWs
NYISO-HQ	1000 MWs
NPX-1385	200 MWs
1385-NPX	200 MWs
HQ-CEDARS	279 MWs Winter / 270 MWs Summer
CEDARS-HQ	100 MWs (Export permit limited)

The remaining external TTC interfaces used by the ISO scheduling systems are determined based on the analysis performed as part of the NYISO Operating Study for Winter 2022-23 and Summer 2022. The limits on the interfaces are obtained from the study. The table below contains a list of these facilities and their associated limitations.

ISO Posted Interfaces	Interface Limits (TTC)
ISONE-NYISO	1400 MWs Winter / 1400 MWs Summer
NYISO- ISONE	1800 MWs Winter / 1600 MWs Summer
IMO-NYISO	2450 MWs Winter / 2050 MWs Summer
NYISO- IMO	1900 MWs Winter / 1650 MWs Summer
PJM-NYISO	2550 MWs Winter / 2250 MWs Summer
NYISO- PJM	2650 MWs Winter / 1200 MWs Summer

The internal TTC interfaces used by the ISO scheduling systems are determined based on stability and voltage collapse analysis. The table below contains a list of these facilities and their associated limitations.

ISO Posted Interfaces	Interface Limits (TTC)
CENT EAST	3725 MWs
DYSINGER EAST	3200 MWs
MOSES SOUTH	3150 MWs
NYPP EAST	7550 MWs
SPRAINBROOK/DUNWOODIE SOUTH	4600 MWs
UPNY CONED	8050 MWs

Generation and Transmission outages

Generation and Transmission outages that create significant reductions in transfer capability are modeled as reductions in the **TTC** limits referenced above. The **TTC** being a term in the ATC calculation will directly affect the resulting $\mathbf{ATC_F}$.

If the generation or transmission outage is only in effect for part of the hour, that hourly **TTC** will be reduced. Similarly, if an outage is only in effect for part of the day, that daily **TTC** will be reduced and if an outage is only in effect for part of the month, that monthly **TTC** will be reduced.

The outages of other Transmission Service Providers that cannot be mapped to the Transmission model would include outages from the neighboring Control Areas. Outages that are supplied to the ISO that affect the TTCs are received along with the outage coordination information and modeled in the ISO system. These TTCs affected by the external outages are used in the ATC calculations.