Methodology for Assessment of Transfer Capability in the Near-Term Transmission Planning Horizon

(NERC Standard FAC-013-2)

May 20, 2013

Document Revision History

Version	Revision	Reviewed By	Date
0	Initial Version	Henry Chao, VP SRP	3/29/2013
1	Sections 1, 3.4, & 4 revised	Henry Chao, VP SRP	5/20/2013

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1. Introduction

The New York Independent System Operator (NYISO) conducts an annual Area Transmission Review (ATR) as an assessment of the reliability of the planned New York State Bulk Electric System (BES) in accordance with established North American Electric Reliability Corporation (NERC) Reliability Standards. This document describes the methodology used by the NYISO to perform an annual assessment of Planning Transfer Capability (PTC) in the Near-Term Transmission Planning Horizon (PTC methodology).

Transfer Capability is defined by NERC as the measure of the ability of interconnected electric systems to move or transfer power in a reliable manner from one area to another over all transmission lines (or paths) between those areas under specified system conditions. The units of transfer capability are in terms of electric power, generally expressed in megawatts (MW). The transfer capability from "Area A" to "Area B" is not generally equal to the transfer capability from "Area B" to "Area A."[1]

PTC is determined by the NYISO in its role as Planning Coordinator in accordance with NERC standard FAC-013-2, "Assessment of Transfer Capability for the Near-Term Transmission Planning Horizon", and is not directly related to calculations of Total Transfer Capability (TTC) or Available Transfer Capability (ATC).

The PTC assessment is not intended to determine the optimized maximum transfer capability. PTC may be sensitive to various factors including, but not limited to, base case load and generation conditions, phase angle regulator (PAR) schedules, and inter-area transfers. These sensitivities are not considered in determining PTC as no attempts are made to obtain the ideal shift pattern for maximum transfer capability.

[1] Glossary of Terms Used in NERC Reliability Standards (http://www.nerc.com/files/Glossary_of_Terms.pdf)

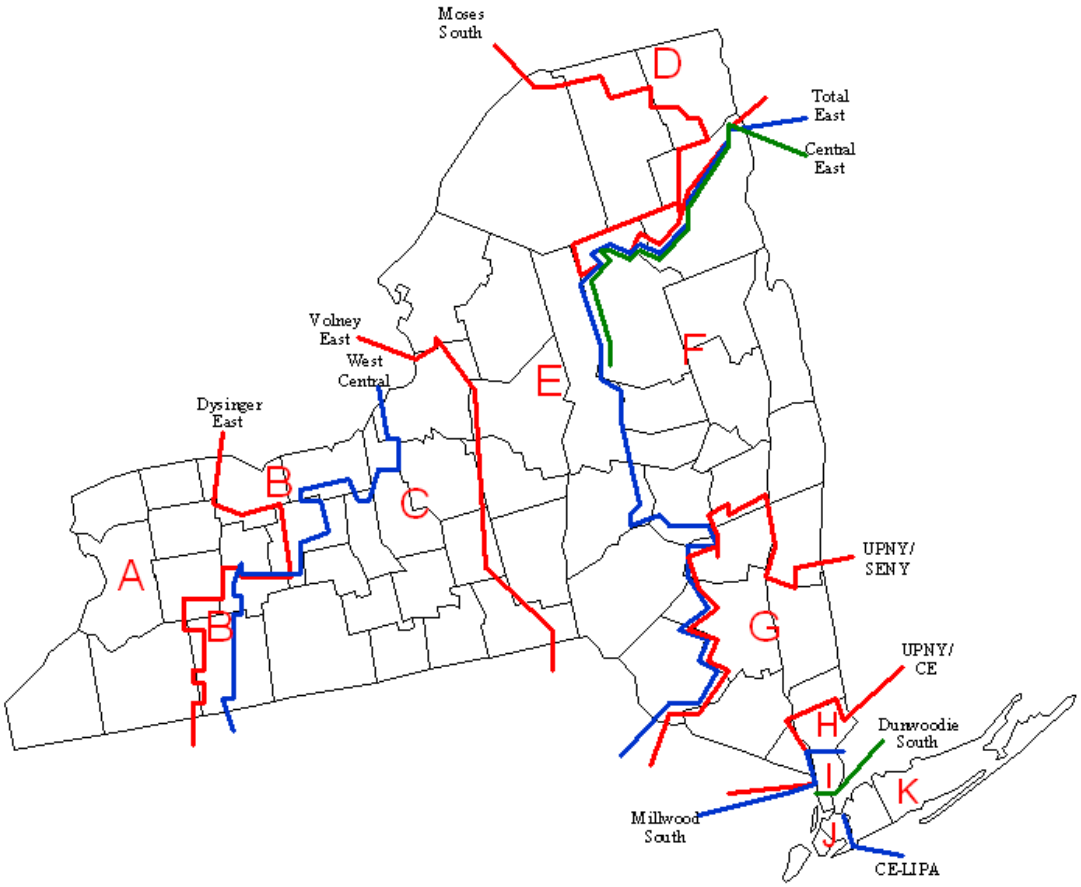
2. Transfer Selection and Criteria

2.1. Transfer Selection

The ATR monitors and evaluates eleven major interfaces between zones within the New York Control Area (NYCA): Dysinger East, West Central, Volney East, Moses South, Central East, Total East, UPNY-SENY, UPNY-ConEd, Millwood South, Sprain Brook – Dunwoodie South, and LIPA Import. Additionally the ATR monitors and evaluates interfaces between the NYISO and all neighboring control areas: Ontario (IESO), Hydro-Quebec, ISO-New England, and PJM.

Figure 1 geographically depicts the NYCA interfaces and load zones.

Figure 1 NYCA Interfaces and Load Zones



2.2. Criteria

The ATR assessment respects known planning horizon System Operating Limits (SOLs). In accordance with NERC standard FAC-010, the NYISO's SOL Methodology is defined in the Northeast Power Coordinating Council (NPCC) Directory #1 – Design and Operation of the Bulk Power System.

The Near-Term Transmission Planning Horizon is defined by NERC as the transmission planning period that covers Year One through five.[2] The ATR assesses the system condition in year five.

The assumptions and criteria applied by the NYISO to perform the PTC assessment are consistent with the following NYISO planning and operation practices:

- NYISO Transmission Expansion and Interconnection Manual
    - Attachment F, NYISO Transmission Planning Guidelines #1-1, Guideline for System Reliability Impact Studies; Section 2.4.2 Impact on System Performance and Transfer Limits (Thermal, Voltage, and Stability)
    - Attachment G, NYISO Transmission Planning Guidelines #2-1, Guideline for Voltage Analysis and Determination of Voltage-Based Transfer Limits
    - Attachment H, NYISO Transmission Planning Guidelines #3-1, Guideline for Stability Analysis and Determination of Stability-Based Transfer Limits
- NYISO Transmission and Dispatching Operations Manual
    - Section 4.2.8 Procedure of Potential Overloads on Non-ISO Secured Facilities regarding post-contingency overloads leading to cascading outages

The assumptions and criteria applied by the NYISO to perform the PTC assessment are also consistent with the following regional and state reliability criteria and rules:

- NPCC Directory #1 – Design and Operation of the Bulk Power System describes the transmission Design Criteria applicable to each Balancing Area within the NPCC Region;
- New York State Reliability Council (NYSRC) Reliability Rules for planning and operating the New York State Bulk Power System regarding PTC assessment in accordance with Normal Transfer Criteria (NTC) and Emergency Transfer Criteria (ETC)

[2] Glossary of Terms Used in NERC Reliability Standards (http://www.nerc.com/files/Glossary_of_Terms.pdf)

3. Assumptions

3.1. Generation Dispatch

The system generation representation for the NYCA in year five, including but not limited to long term planned generation outages, additions and retirements, is consistent with the current NYISO FERC Form No. 715 filing and "Load and Capacity Data" report.

For the PTC assessments, a uniform dispatch is employed in Zones A through I. Generation in Zones J and K is dispatched based on historical output. All generating units in Zones A through I are placed in-service at an equal percentage of each unit's maximum capacity (P_{max}), except for the following:

- Wind generation is dispatched at 10% and 30% of its nameplate value for summer and winter study periods, respectively;
- Nuclear generation is dispatched at its Dependable Maximum Net Capability (DMNC) tested value;
- Run-of-river hydro is dispatched based on historical output.

Generation is re-dispatched to respect the most constraining planning horizon SOL in the NYCA; currently this is UPNY-SENY. To accomplish this, generation dispatch in Zones A through F is decreased uniformly while generation is re-dispatched in the following order:

1. Zones G through I (excluding wind, nuclear and run-of-river hydro) are increased uniformly, typically resulting in generation in Zones G through I dispatched to its P_{max} (provided the dispatch does not cause any SOL violations);
2. Zone J is increased based on historical summer dispatch respecting local SOLs;
3. Zone K is increased based on historical summer dispatch respecting local SOLs.

After the most constraining planning horizon SOL is satisfied, remaining generation in Zones G through J is increased while generation in Zone K is decreased to maximize flows from Zone I to Zone K. This step is to simplify the evaluation of the Sprain Brook – Dunwoodie South PTC.

The methodology described above recognizes how different interfaces are limited due to the composite of the generation and its locations in the system. Major changes to the generation or the transmission system would warrant reevaluation of the current methodology.

3.2. Transmission System Topology

The transmission system topology for the NYCA in year five, including but not limited to long term planned transmission outages, additions and retirements, is consistent with the current NYISO FERC Form No. 715 filing and "Load and Capacity Data" report.

3.3. System Demand

The PTC assessments are performed using a year five baseline statewide coincident summer peak case. The load forecast and model used in PTC assessments are consistent with the current NYISO FERC Form No. 715 filing and "Load and Capacity Data" report.

3.4. Projected Transmission Uses

The interchange schedule with external systems modeled in the PTC assessments is determined by the Eastern Interconnection Reliability Assessment Group Multi-Area Modeling Working Group (ERAG MMWG) and consistent with the current FERC Form No. 715 filing. PAR schedules are consistent with the current NYISO FERC Form No. 715 filing; any changes to those schedules will be documented in the PTC assessment. There are no firm transfers within the NYCA.

3.5. Parallel Path

The system representation explicitly models tie-lines between NYCA and all neighboring Areas (ISO-NE, IESO, PJM, and Hydro-Quebec); therefore, there is no loop flow adjustment required for PTC assessments. Any parallel path impacts on inter-regional and intra-regional interfaces are captured in the simulation results.

3.6. Contingencies

Contingency selection for assessments of PTC is provided in:

- NERC TPL Standard Table 1
- NPCC Directory #1
- NYSRC Reliability Rules Table A

3.7. Monitored Facilities

NYCA Bulk Electric System elements will be monitored when conducting an assessment of PTC.

4. Description of Transfers Performed

Generation resources are adjusted to allow for equal participation of aggregated generators in the generation shift to calculate the PTC. Generation in the source zones is increased uniformly while generation in the sink area is decreased uniformly. Nuclear, wind, and run-of-river hydro units are excluded from generation shifts. PTC may be sensitive to various factors including, but not limited to, base case load and generation conditions, PAR schedules, and inter-area transfers. These sensitivities are not considered in determining PTC as no attempts are made to obtain the ideal shift pattern for maximum transfer capability.

Thermal analysis will be performed for all intra-area interfaces. Voltage and stability analysis may be performed if deemed necessary based on known planning horizon SOLs. The following sources and sinks are typically used for each given intra-area interface:

Intra-area Interface	Source Zone(s)	Sink Zone(s)
Dysinger East	IESO – A	G – I
West Central	IESO – B	G – I
Volney East	IESO – C	G – I
Moses South	D	G – I
Central East/Total East	IESO – E	G – I
UPNY-SENY	IESO – F	J
UPNY-ConEd	IESO – G	J
Sprain Brook – Dunwoodie South	IESO – G	J
LIPA Import	A – G	K

Thermal analysis will be performed for all inter-area interfaces. The following sources and sinks are typically used for each given inter-area interface:

Inter-area Interface	Source Area/ Zone(s)	Sink Area/ Zone(s)
IESO-NY	IESO	Central (C) 60% Capital (F) 25% Hudson (G) 5% NYC (J) 10%
NY-IESO	Central (C) 60% Capital (F) 40%	IESO
PJM-NY	PJM	A – G 90% I – J 10%
NY-PJM	A – G 90% I – J 10%	PJM
NE-NY	NE_SOUTH[3] 50% NE_NORTH[3] 50%	Capital (F) 35% NYC (J) 65%
NY-NE	Capital (F) 40% NYC (J) 60%	NE_SOUTH[3] 50% NE_NORTH[3] 50%

[3] From the DBYYYY_ne.sub file

5. Distribution and Notification of Methodology Document

5.1. Methodology Distribution

The issuance of the original or revised versions of this document will include an email notification for the following entities:

- Each Planning Coordinator (PC) adjacent to NYCA
- Each Transmission Planner (TP) within NYCA

Any functional entity with a reliability-related need for this methodology document may submit a written request for it to the NYISO (market_services@nyiso.com). If the request is approved, the NYISO will distribute this methodology document within 30 calendar days of receiving that written request.

5.2. Response to Methodology Comments

The NYISO will provide a documented response within 45 calendar days if any of the previously identified recipients of the methodology document provides documented concerns with the methodology document. Documented concerns should be written and submitted to the NYISO (market_services@nyiso.com). The documented response from the NYISO will indicate whether a change will be made to the methodology document and, if no change will be made to the methodology document, the reason why.

6. Frequency of Assessment

In accordance with FAC-013-2 Requirement R4, during each calendar year the NYISO will conduct simulations and document an assessment based on those simulations in accordance with this Planning Transfer Capability Methodology for at least one year in the Near-Term Transmission Planning Horizon.

7. Distribution of Assessment Report Results

7.1. Assessment Report Distribution and Response to Comments

Once an assessment is finalized, the documented Planning Transfer Capability assessment results shall be made available on the NYISO public website within 45 calendar days.

7.2. Response to Data Requests

Any functional entity with a reliability related need for the documented Planning Transfer Capability assessment may submit a written request to the NYISO (market_services@nyiso.com) for data to support the assessment results. If the request is approved, the NYISO shall provide such data to that entity within 45 calendar days of receipt of the request. The provision of such data shall be subject to NYISO policies and procedures regarding the disclosure of confidential or sensitive information.

8. Appendix A (NERC Standard Mapping Table)

Table 1: NERC FAC-013-2 Standard Mapping Table

Requirement	Text of Requirement	Methodology Section
R1.	Each Planning Coordinator shall have a documented methodology it uses to perform an annual assessment of Transfer Capability in the Near-Term Transmission Planning Horizon (Transfer Capability methodology). The Transfer Capability methodology shall include, at a minimum, the following information:	See Below
R1.1.	Criteria for the selection of the transfers to be assessed.	2.1
R1.2.	A statement that the assessment shall respect known System Operating Limits (SOLs).	2.2
R1.3.	A statement that the assumptions and criteria used to perform the assessment are consistent with the Planning Coordinator's planning practices.	2.2
R1.4.	A description of how each of the following assumptions and criteria used in performing the assessment are addressed:	See Below
R1.4.1.	Generation dispatch, including but not limited to long term planned outages, additions and retirements.	3.1
R1.4.2.	Transmission system topology, including but not limited to long term planned Transmission outages, additions, and retirements.	3.2
R1.4.3.	System demand.	3.3
R1.4.4.	Current approved and projected Transmission uses.	3.4
R1.4.5.	Parallel path (loop flow) adjustments.	3.5
R1.4.6.	Contingencies	3.6
R1.4.7.	Monitored Facilities.	3.7
R1.5.	A description of how simulations of transfers are performed through the adjustment of generation, Load or both.	4
R2.	Each Planning Coordinator shall issue its Transfer Capability methodology, and any revisions to the Transfer Capability methodology, to the following entities subject to the following:	See Below
R2.1.	Distribute to the following prior to the effectiveness of such revisions:	5.1
R2.1.1.	Each Planning Coordinator adjacent to the Planning Coordinator's Planning Coordinator area or overlapping the Planning Coordinator's area.	5.1
R2.1.2.	Each Transmission Planner within the Planning Coordinator's Planning Coordinator area.	5.1
R2.2.	Distribute to each functional entity that has a reliability-related need for the Transfer Capability methodology and submits a request for that methodology within 30 calendar days of receiving that written request.	5.1

Requirement	Text of Requirement	Methodology Section
R3.	If a recipient of the Transfer Capability methodology provides documented concerns with the methodology, the Planning Coordinator shall provide a documented response to that recipient within 45 calendar days of receipt of those comments. The response shall indicate whether a change will be made to the Transfer Capability methodology and, if no change will be made to that Transfer Capability methodology, the reason why.	5.2
R4.	During each calendar year, each Planning Coordinator shall conduct simulations and document an assessment based on those simulations in accordance with its Transfer Capability methodology for at least one year in the Near-Term Transmission Planning Horizon.	6
R5.	Each Planning Coordinator shall make the documented Transfer Capability assessment results available within 45 calendar days of the completion of the assessment to the recipients of its Transfer Capability methodology pursuant to Requirement R2, Parts 2.1 and Part 2.2. However, if a functional entity that has a reliability related need for the results of the annual assessment of the Transfer Capabilities makes a written request for such an assessment after the completion of the assessment, the Planning Coordinator shall make the documented Transfer Capability assessment results available to that entity within 45 calendar days of receipt of the request	7.1
R6.	If a recipient of a documented Transfer Capability assessment requests data to support the assessment results, the Planning Coordinator shall provide such data to that entity within 45 calendar days of receipt of the request. The provision of such data shall be subject to the legal and regulatory obligations of the Planning Coordinator's area regarding the disclosure of confidential and/or sensitive information.	7.2