

SUMMARY

This paper is intended to outline the IESO's recommended plan for achieving the revised Transmission Rights (TR) confidence level approved by the Board in September 2013. The new confidence level is to be established on a path basis such that the congestion rents collected by the IESO will be approximately equal to the IESO's TR payment obligations. The new confidence level will be implemented in two timeframes including the implementation timeframe and the maintenance timeframe. The target for implementation is short-term TRs valid in September 2014 and long-term TRs valid beginning in October 2014. On most transmission rights paths the new process will lead to a reduction in long-term transmission rights quantities while providing flexibility in short-term transmission rights offerings.

Implementation Timeframe

During the implementation timeframe of approximately one year, the IESO is proposing to gradually adjust TR quantities on each path to reach the ideal quantity which would have historically created a balance between congestion rents and TR payments. Market manual revisions will be stakeholdered through the interim market document change (IMDC) procedure and the interim changes will be applicable until the maintenance timeframe is activated. The following steps are required:

- Establish the base quantity for each path based on historical schedules and offer approximately 25% of the base quantity at each long-term auction.
- Determine the initial ideal quantity of TRs to achieve a balance of congestion rents and TR payments on each path based on historical values for congestion rent and intertie congestion price (ICP). This initial ideal quantity will represent the target for the upper limit of combined short-term and long-term rights on each path.
- Change the internal process to consider single/multiple, internal/external, planned/foreseeable or concurrent/consecutive outages when determining TR quantities for auction.¹
- Change the internal process to consider non-tie line constraints which limit the expected transmission transfer capability on a path when determining TR quantities for auction. An example would be a constraint on an internal/external interface.
- Discontinue the existing stabilization algorithm

Maintenance Timeframe

The maintenance timeframe will be activated at a date determined by the IESO, but may be up to one year following the implementation timeframe. The additional market manual and report changes for the maintenance timeframe will be made through the standard baseline process. The following steps are required:

¹ This expands outage criteria to include foreseeable outages on all paths and internal/external outages on Michigan and NY paths. Note that this applies only to the transmission transfer capability for the determination of TR quantities and does not impact scheduling limits.

- Establish a new public report to publish monthly and cumulative congestion rents collected and TR payments on a path basis.
- Establish a maintenance plan algorithm to increase and decrease TR quantities on a path basis in order to maintain a financial balance between congestion rents collected and TR payment obligations.
 - Establish a dead-band for each path. TR quantities will be increased or decreased if the cumulative difference between congestion rents collected and TR payments falls outside the upper or lower limits of the dead-band on a path basis.
 - Establish the TR increment for each path.
 - Revise the existing pre-auction report template to provide increment information and revise market manuals to reflect the maintenance algorithm and to allow for long-term TRs to be sold below base quantity for financial reasons.

BASE QUANTITY

Base quantity is currently defined in market manual 4, part 4.4 as ‘the minimum number of rights sold on a path (combined long-term and short-term) and is calculated based on the TTC of the path discounted per Market Rule Chapter 8, s4.7.3.’ For multi-circuit paths, the TR base quantity is limited to the TTC with one circuit out of service, less any operating and control margins, or past practice connections and schedules. For single circuit paths, the TR base quantity is limited to the circuit’s capability or any lower limit that would result from a single terminal circuit breaker or switch outage, less any operating and control margins or past practice connections and schedules. The TR base quantity on radial paths may be further limited by the amount of load or generation that can be reasonably isolated on one side of the path.

Under the revised confidence level the IESO is proposing that base quantity will be determined for each path based on historical schedules since congestion rents are collected based on scheduled quantities of imports and exports. Without a limitation based on historical schedules it is possible that TR payment obligations will exceed the congestion rents collected. The IESO has reviewed historical scheduled flows on each path over the 24 month period April 2012 to March 2014. The base quantity will be established as the value at which the scheduled flows equalled or exceeded at least 70% of the time. This will be a conservative value at which the IESO expects collected congestion rents to exceed TR payment obligations.

The new base quantity on each path will be set as a single, fixed, year-round value. The concept of different summer/winter base quantities was introduced before the stabilization method came into effect and allowed for the sale of more TRs in short term auctions during the winter months when the TTCs of the paths are generally greater. This is no longer applicable since TRs will be auctioned based on a financial balance.

The base quantity may need to be revised during the implementation timeframe, since the base quantity has been set based on a historical snapshot which may change. Such a revision could be based on a rolling historical snapshot, or on a revised method of setting base quantity. The IESO proposes to review

the base quantity at two year intervals once a financial balance is achieved. If it is determined that the initial base quantity is not a conservative value at which TR payments are less than collected congestion rents, then the base quantity and/or the method of setting base quantity may need to be revised. Any change to the methodology would be revised in consultation with stakeholders.

INITIAL IDEAL QUANTITY

Under the current procedure TR quantities do not result in a balance between congestion rents collected and TR payments on a path basis. The IESO has determined the initial ideal quantity of TRs to achieve a balance on each path based on historical (April 2012 to March 2014) values of congestion rent and intertie congestion price (ICP).

For the purposes of allocating congestion rents by path, the IESO assumed that if the ICP indicated import congestion in a specific hour then all congestion rents in that hour were allocated to the import path, including congestion rents paid by the IESO in relation to export transactions. Transactions flowing in the opposite direction to congestion have a negative impact on the financial balance between TR payments and congestion rents. Historically, this has been observed on the Manitoba, Michigan and Minnesota paths.

For each path, the sum of the congestion rents was divided by the sum of the ICPs over the historical period. The result is the initial ideal quantity of TRs for a financial balance between congestion rents collected and transmission rights payments over the period.

During the implementation timeframe the quantities of TRs offered on each path will gradually approach the initial ideal quantity through the expiration of previously sold long-term rights and/or through the sale of short-term rights. The implementation timeframe target is a combination of long-term and short-term rights with an upper limit of the initial ideal quantity. The initial ideal quantity may be lower than the number of long-term rights that are currently valid. In this scenario, the IESO recommends that long-term rights will continue to be sold in quarterly auctions (at 25% of the new base quantity) but short-term rights may not be available.

The initial ideal quantity may need to be re-set if necessary during the implementation timeframe, using the same methodology but considering a more recent two year snapshot of historical congestion rent and ICP.

LONG TERM TR QUANTITY

Currently, the number of transmission rights offered on each path at a long-term auction is limited to the lowest of the winter and summer TR base quantities, or the path's transfer capability minus applicable margins with consideration to outages (single/multiple or concurrent/consecutive) that have an impact for more than 30 days. Under the new method, the number of TRs offered on each path must take into account financial balance between congestion rents and TR payments to ensure each path is not oversold. The current outage criteria used to determine TR quantities must be expanded to take into account all outages and constraints which could impact the calculation of the transmission transfer capability (expected flow) which is used to determine TR availability on a path. In addition to planned outages, the IESO must evaluate expected or foreseeable outages which could impact the path, including internal and

external outages. The IESO must also evaluate constraints on non-tie line internal or external interfaces which could impact the expected flow on a path.

During the implementation timeframe of the new confidence level the IESO recommends that the number of TRs offered on each path at each long-term auction will be limited to the lowest of:

- 25% of the new base quantity; or
- The expected transmission transfer capability minus applicable margins with consideration to outages (single/multiple, internal/external, planned/foreseeable or concurrent/consecutive) that have an impact for more than 30 days.
- The expected transmission transfer capability minus applicable margins with consideration to non-tieline constraints (for example, a constraint on an internal/external interface that imposes a limit on import/export).

During the maintenance timeframe of the new confidence level the IESO recommends that the number of TRs offered on each path at each long-term auction will be limited to the lowest of:

- 25% of the new base quantity; or
- The expected transmission transfer capability minus applicable margins with consideration to outages (single/multiple, internal/external, planned/foreseeable or concurrent/consecutive) that have an impact for more than 30 days; or
- The expected transmission transfer capability minus applicable margins with consideration to non-tie line constraints (for example, a constraint on an internal/external interface that imposes a limit on import/export).
- The quantity determined by the maintenance algorithm to achieve financial balance.

Similar to current practice, approximately 25% of the base quantity will be auctioned at each quarterly auction unless limited by the maintenance plan. The long-term TR quantity will be capped to the base quantity on the high side and zero on the low side. For the maintenance timeframe, market manual changes will be required in order to sell long-term TRs below the base quantity for financial reasons if directed by the maintenance algorithm.

SHORT TERM TR QUANTITY

Currently, the number of transmission rights offered on each path at a short-term auction is limited to the lowest of the appropriate winter or summer TR base quantity plus the total MW increments in order to stabilize the transmission rights clearing account (TRCA) under the existing stabilization algorithm (capped to the path's transfer capability with all elements in service minus applicable margins), or the path's transfer capability minus applicable margins with consideration to outages (single/multiple or concurrent/consecutive) that have an impact for more than 7 days.

During the implementation timeframe of the new confidence level the existing stabilization algorithm will be discontinued. The combination of offered long-term and short-term rights will target a cap of the

initial ideal quantity on the high side. Short-term quantities may not be offered on a path until the expiry of previously sold long-term rights reduces the total quantity below the initial ideal quantity.

During the maintenance timeframe, the combination of long-term and short-term rights will be capped by the quantity determined by the maintenance algorithm.

Consistent with the long-term quantity methodology, the IESO will consider all expected outages and constraints when determining short-term quantities for auction.

During the implementation timeframe of the new confidence level the IESO recommends that at each short-term auction the total number of TRs offered on each path (combined long-term and short-term) is limited to the lowest of:

- The calculated initial ideal quantity;
- The expected transmission transfer capability minus applicable margins with consideration to outages (single/multiple, internal/external, planned/foreseeable or concurrent/consecutive) that have an impact for more than 7 days;
- The expected transmission transfer capability minus applicable margins with consideration to non-tie line constraints (for example, a constraint on an internal/external interface that imposes a limit on import/export).

During the maintenance timeframe of the new confidence level the IESO recommends that at short-term auction the total number of TRs offered on each path (combined long-term and short-term) is limited to the lowest of:

- The expected transmission transfer capability minus applicable margins with consideration to outages (single/multiple, internal/external, planned/foreseeable or concurrent/consecutive) that have an impact for more than 7 days; or
- The expected transmission transfer capability minus applicable margins with consideration to non-tie line constraints, e.g. a constraint on an internal/external interface that imposes a limit on import/export.
- The quantity determined by the maintenance algorithm to achieve financial balance.
- Summer available transfer capability (ATC)²

Short term rights are only available if the total TR quantity determined using the above criteria has not already been sold in previous long-term auctions.

² TRs will not be sold above the summer ATC at any of the 12 monthly auctions. This simplifies decreases under the maintenance algorithm.

MAINTENANCE ALGORITHM

During the maintenance timeframe a new algorithm will be activated to increase or decrease TR quantities on each path based on the difference between collected congestion rents and TR payments. The first adjustment will be an increase or decrease from the initial ideal quantity used in the implementation timeframe. The IESO will announce the date for the activation of the maintenance timeframe when a firm date is established for the availability of the proposed new monthly public report of congestion rents and TR payments (expected after the expiry of long-term TRs which were sold under the previous process). This is expected within one year of implementation of the initial changes. If there is a delay in the availability of the monthly report which delays the activation of the maintenance algorithm, the IESO may revise the initial ideal and base quantities on each path as an interim measure to ensure that a financial balance is maintained. The new ideal quantity will be based on updated historical data and the first adjustment under the maintenance plan will be an adjustment to this revised ideal quantity.

The IESO recommends a maintenance algorithm which tracks the monthly and cumulative collected congestion rents and TR payments on each path using the new monthly public report, and increases or decreases the maximum TR quantity on each path when the cumulative difference is outside the upper or lower limits of a specified dead-band. The dead-band will vary for each path. The goal is to achieve a cumulative balance of zero (congestion rents collected minus TR payments are in financial balance) with a dead-band. The proposed algorithm will reduce TR quantities on a path when the IESO's TR payment obligations exceed the value of congestion rents collected, and will increase TR quantities when collected congestion rents exceed the IESO's TR payment obligations. Quantities can only be increased when the balance in the TRCA exceeds the existing threshold of \$20M. The threshold may be adjusted when the maintenance plan is initiated.

The maintenance plan will typically adjust short-term quantities. If the maintenance plan results in a maximum TR quantity below the quantity that has already been sold in previous LT auctions, then short-term quantities will not be auctioned and the reduction will apply to long-term quantities at the next long-term auction. The base quantity may need to be re-evaluated if this scenario occurs on a regular basis. The base quantity may be revised using the same methodology. Any change to the methodology would be revised in consultation with stakeholders.

The IESO proposed algorithm is summarized in the following table:

TRCA Balance	Cumulative Difference between Monthly Congestion Rents Collected and TR Payments (by TR path)	Impact on Monthly TRs (by TR path)
N/A	Between the upper and lower limits of the dead-band	No change
> TRCA threshold*	Exceeds upper limit of the dead-band	+(increment value)
< TRCA threshold*	Exceeds upper limit of the dead-band	No change**
N/A	Less than lower limit of the dead-band	-(increment value)
* The TRCA threshold is currently \$20M.		
** TRs offered will not be increased to balance congestion rents and TR payments because TRCA balance is below threshold.		

The process for tracking the difference between congestion rents and transmission rights payments is outlined in the following table. The time lag between publishing the pre-auction reports and the month in which the TR is valid results in exposure of two months when the dead-band has been exceeded but TR quantities have not been modified. However, using a monthly process instead of the former quarterly process eliminates a further two months of exposure which could have resulted if the imbalance had occurred in the first month of the quarterly evaluation period.

Month of Pre-Auction Report Publication	Months Considered in Cumulative Difference of Collected Congestion Rents and TR Payment Obligations	Month where Changes Apply
January	Cumulative Value plus December (plus January if updated before Bid window)	March
February	Cumulative Value plus January (plus February if updated before Bid window)	April
March	Cumulative Value plus February (plus March if updated before Bid window)	May
April	Cumulative Value plus March (plus April if updated before Bid window)	June
May	Cumulative Value plus April (plus May if updated before Bid window)	July
June	Cumulative Value plus May (plus June if updated before Bid window)	August
July	Cumulative Value plus June (plus July if updated before Bid window)	September
August	Cumulative Value plus July (plus August if updated before Bid window)	October
September	Cumulative Value plus August (plus September if updated before Bid window)	November
October	Cumulative Value plus September (plus October if updated before Bid window)	December
November	Cumulative Value plus October (plus November if updated before Bid window)	January
December	Cumulative Value plus November (plus December if updated before Bid window)	February

Maintenance Algorithm Considerations:

- The IESO will determine the upper and lower limits of the dead-band for each path no later than one month prior to the activation of the maintenance timeframe based on experience with reduced TR amounts. The details will be included in a later market manual revision.
- The IESO will create a new monthly public report for the monthly and cumulative congestion rents and TR payments by path and revise the existing pre-auction report to accommodate increment information.
- The IESO will determine the increment for the increase/decrease in TR quantity for each path no later than one month prior to the maintenance timeframe activation. The details will be included in a later market manual revision. The IESO is considering a number of alternatives for determining the increment:
 - An increment of 4% (or some other percentage) of the total TRs valid in the previous month. This method makes adjustments based on the quantity of TRs that actually contributed to the difference between congestion rents and TR payments.

- An increment of 4% (or some other percentage) of the difference between summer ATC and the new base quantity. Selling at the 100% level is equivalent to selling at summer ATC.
 - An increment of 10% of the new base quantity, to a maximum increment of 25 MW.
- The number of TRs on each path will not be auctioned at levels greater than summer ATC.

PROPOSED TRANSMISSION RIGHTS REVISIONS BASED ON HISTORICAL DATA FROM APRIL 2012 TO MARCH 2014

TR Path	Current Summer Base Quantity (MW)	Average Monthly TRs (MW)	Sum of Transmission Rights Payments (\$)	Sum of Congestion Rents Collected (\$)	Sum of ICP (absolute \$/MW)	Initial Ideal Quantity (MW)	Base Quantity (MW)
MAN-ON	150	203	8,850,186	1,697,573	45,952	40	40
MICH-ON ¹	850	1313	3,319,963	1,861,191	2,991	625	115
MIN-ON ²	80	55	1,412,243	-66,156	22,994	16	16
NY-ON	900	1161	504,470	350,822	312	1125	150
QOUTA-ON ³	615	614	867,336	1,131,978	1,411	805	280
QBEAU-ON	390	767	251,922	123,430	322	385	200
QD5A-ON ⁴	110	206	0	0	0	110	60
QD4Z-ON	36	39	6,182	9,549	172	60	50
QP33C-ON	190	282	30,741	11,877	121	100	80
QX2Y-ON ²	45	45	1,006	268	22	16	16
ON-MAN	150	88	166,402	124,724	2,811	45	24
ON-MICH	750	1522	85,976,260	61,644,487	57,540	1075	630
ON-MIN ²	130	89	4,903,282	609,699	60,141	16	16
ON-NY	1000	1340	48,961,989	33,053,176	35,176	940	600
ON-QOUTA ³	615	613	5,021,337	8,620,683	8,168	1055	150
ON-QD5A ⁵	115	189	0	0	0	115	0
ON-QH4Z	65	64	440,401	717,867	8,710	85	50

Notes:

1. MICH-ON: the data in the table has been adjusted to remove three hours from the calculations. These hours were reported on by the MSP and were subject to internal limitations which caused imports to be constrained off. Data prior to the adjustment: TR payment = \$3,876,778; CR collected = \$1,751,310; sum of ICP = 3375.
2. MIN-ON/ON-MIN/QX2Y-ON: the recommended base quantity must be greater than or equal to 16MW to facilitate the required ratio at LT auction rounds. Ideal quantity must be greater than or equal to base quantity. Rather than setting base quantity to zero, the IESO proposes to set base quantity to 16 MW on these paths. Ideal quantity will be increased to 16 MW. The result is that all TRs will be offered as long-term TRs.
3. QOUTA: due to a foreseeable outage on one converter, maximum TR offerings are capped to an upper limit of 615MW regardless of ideal quantity or financial balance.
4. QD5A-ON: there was no congestion during the period so ideal quantity could not be calculated. The IESO recommends an ideal quantity equal to the current base quantity.
5. ON-QD5A; there was no congestion or scheduled MW during the period. The IESO recommends an ideal quantity equal to the current base quantity and a new base quantity of zero.

IMPLEMENTATION EXAMPLES

Example #1: Current Base Quantity < Initial Ideal Quantity (based on NY-ON values)

Current Base Quantity: 900 MW (225 MW at each quarterly LT auction)
 New Base Quantity: 150 MW (rounded to 152 MW in table, 38 MW at each quarterly LT auction)
 Initial Ideal Quantity: 1125 MW

Implement maintenance algorithm or revise base or ideal quantities

	September	October	November	December	January	February	March	April	May	June	July	August	September	October
Quarterly LT Auction (Oct)	225	38	38	38	38	38	38	38	38	38	38	38	38	38
Quarterly LT Auction (Jan)	225	225	225	225	38	38	38	38	38	38	38	38	38	38
Quarterly LT Auction (Apr)	225	225	225	225	225	225	225	38	38	38	38	38	38	38
Quarterly LT Auction (Jul)	225	225	225	225	225	225	225	225	225	225	38	38	38	38
Monthly ST Auctions	225	412	412	412	599	599	599	786	786	786	973	973	973	973
Total LT + ST TRs	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125	1125

Example #2: Current Base Quantity > Initial Ideal Quantity (based on ON-MAN values)

Current Base Quantity: 150 MW (rounded to 38 MW at each quarterly LT auction)
 New Base Quantity: 24 MW (6 MW at each quarterly LT auction)
 Initial Ideal Quantity: 45 MW

Implement maintenance algorithm or revise base or ideal quantities

	September	October	November	December	January	February	March	April	May	June	July	August	September	October
Quarterly LT Auction (Oct)	38	6	6	6	6	6	6	6	6	6	6	6	6	6
Quarterly LT Auction (Jan)	38	38	38	38	6	6	6	6	6	6	6	6	6	6
Quarterly LT Auction (Apr)	38	38	38	38	38	38	38	6	6	6	6	6	6	6
Quarterly LT Auction (Jul)	38	38	38	38	38	38	38	38	38	38	6	6	6	6
Monthly ST Auctions	0	0	0	0	0	0	0	0	0	0	21	21	21	21
Total LT + ST TRs	152	120	120	120	88	88	88	56	56	56	45	45	45	45

GLOSSARY

Terms defined in the NPCC Glossary of Terms

- **Available Transfer Capability (ATC)**
A measure of the transfer capability remaining in the physical transmission network for further commercial activity over and above already committed uses. ATC is defined as the Total Transfer Capability (TTC), less the Transmission Reliability Margin (TRM), less the sum of existing transmission commitments (which includes retail customer service) and the Capacity Benefit Margin (CBM).

- **Total Transfer Capability (TTC)**
The amount of electric power that can be transferred over the interconnected transmission network in a reliable manner based on all of the following conditions:
 1. *For the existing or planned system configuration, and with normal (precontingency) operating procedures in effect, all facility loadings are within normal ratings and all voltages are within normal limits.*
 2. *The electric systems are capable of absorbing the dynamic power swings, and remaining stable, following a disturbance that results in the loss of any single electric system element, such as a transmission line, transformer, or generating unit.*
 3. *After the dynamic power swings subside following a disturbance that results in the loss of any single electric system element as described in 2 above, and after the operation of any automatic operating systems, but before any post-contingency operator-initiated system adjustments are implemented, all transmission facility loadings are within emergency ratings and all voltages are within emergency limits*
 4. *With reference to condition 1 above, in the case where precontingency facility loadings reach normal thermal ratings at a transfer level below that at which any first contingency transfer limits are reached, the transfer capability is defined as that transfer level at which such normal ratings are reached.*
 5. *In some cases, individual system, power pool, subregional, or Regional planning criteria or guides may require consideration of specified multiple contingencies, such as the outage of transmission circuits using common towers or rights-of-way, in the determination of transfer capability limits. If the resulting transfer limits for these multiple contingencies are more restrictive than the single contingency considerations described above, the more restrictive reliability criteria or guides must be observed.*

In the IESO's market manual 4, part 4, table C.1 the TTC is published with all elements in service.

- **Transfer Capability**
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." (Source: NERC Glossary of Terms)

- **Transmission Reliability Margin (TRM)**
TRM is defined as that amount of transmission transfer capability necessary to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in system conditions.

Terms Defined in IESO Market Rules

- **Transmission Transfer Capability**
The measure, in terms of electric power expressed in megawatts, 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.

This term is used in Chapter 8, section 4.7 as a measure of the expected flow on a path and is used to determine TR availability for the purpose of achieving the confidence level. The expected transmission transfer capability is based on the TTC and TRM, further reduced through consideration to planned and foreseeable constraints and outages, both internal and external. Note that throughout this document the use of Transmission Transfer Capability is in relation to TR availability. It is not the NPCC defined term TTC and does not impact scheduling limits.

Terms Unique to This Document

- **Initial Ideal Quantity**
The quantity of TRs which, if auctioned, would have achieved financial balance between transmission rights payment obligations and collected congestion rents on each path over the historic period April 2012-March 2014.
- **Ideal Quantity**
If the activation of the maintenance timeframe is delayed, or if needed during the implementation timeframe, the initial ideal quantity may be revised based on more recent historical data. The result is a new ideal quantity.
- **Quantity Determined by Maintenance Algorithm**
The maintenance algorithm will increase and decrease TR quantities to achieve financial balance. The first adjustment will be made from the initial ideal quantity (or ideal quantity if the initial ideal quantity is revised).