Urgent Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	**MR-00323-R00**			
Subject:	**Day-Ahead Commitment Process**			
Title:	**Day-Ahead Intertie Offer Guarantee Adjustment**			
Nature of Proposal:	☐ Alteration	☐ Deletion	☒ Addition	
Chapter:	9	Appendix:		
Sections:	3.8A			
Sub-sections proposed for amending:	3.8A.7; 3.8A.8, 3.8A.9 (all new)			

PART 2 – PROPOSAL HISTORY

Version	Reason for Issuing	Version Date
1.0	Submit for Technical Panel Review	5 Jul 06
2.0	Revised to include Technical Panel Comments: Forwarded to PA Consulting	6 Jul 06
3.0	Submit for Technical Panel Review	17 Jul 06
4.0	Submit for IESO Board Approval	19 Jul 06
5.0	Approved by IESO Board	27 Jul 06

Approved Amendment Publication Date:	27 Jul 06
Approved Amendment Effective Date:	28 Jul 06

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

Provide a brief description of the following:

- The reason for the proposed amendment and the impact on the *IESO-administered markets* if the amendment is not made.
- Alternative solutions considered.
- The proposed amendment, how the amendment addresses the above reason and impact of the proposed amendment on the *IESO-administered markets*.

Summary

This amendment provides for an adjustment to market participant settlement amounts to ensure that market participants receive sufficient intertie offer guarantee revenues for import transactions that receive a day-ahead commitment process (DACP) constrained schedule. This adjustment, the day-ahead intertie offer guarantee adjustment (DA_IOG{adj}), would provide the market participant with a correction payment if market revenues for the import transaction, calculated under the existing settlement formulations, are not consistent with the intent of intertie offer guarantees and, as a result, do not provide sufficient payments for such import transactions.

This amendment also provides the IESO with flexibility as to how and when these adjustments would be reported, distributed and recovered from the market. This flexibility is necessary as the IESO will be using a manual process to determine these adjustments and because the frequency of the need for these adjustments is not known.

This amendment meets the following statutory criteria for being considered urgent:

"to avoid, reduce the risk of or mitigate the effects of an unintended adverse effect of a market rule." (section 34(1)(4) of the Electricity Act, 1998)

The existing market rules would have the unintended adverse effect of payment of insufficient intertie offer guarantee revenues for such import transactions given the intent of the day-ahead and real-time intertie offer guarantees. Since the commencement of the DACP (June 1, 2006), it is estimated that seven of the 200 import transactions scheduled in the DACP have been under-paid by approximately 11 k$ as a result of the existing settlement formulations. The risk of such under-payments may discourage importers from participating in the DACP, which would reduce the effectiveness of the DACP.

Background

Day-Ahead Commitment Process and Day-Ahead Intertie Offer Guarantee

The Day-Ahead Commitment Process (DACP) was introduced to assist in maintaining reliability of the IESO-controlled grid. One element of DACP is to provide a day-ahead intertie offer guarantee (DA_IOG) for import transactions that receive a schedule through the DACP. The DA_IOG is a guarantee that the market participant receives revenues at least equal to their day-ahead constrained scheduled import quantity multiplied by the day-ahead offered price. Please refer to DACP High Level design and MR-00305 for further information on the DACP and DA_IOG at the following links:

http://www.ieso.ca/imoweb/pubs/consult/se16/se16_DACP-design-description-v3.pdf

http://www.ieso.ca/imoweb/pubs/mr2006/MR_00305-R00-R09-BA.pdf

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

DACP, as part of the DACP design, the participant is required to offer that import transaction in real-time in order that the import transaction is physically scheduled and flows. The market participant is also allowed to change the import offer prices and quantities. Therefore it is possible for the market participant to receive real-time constrained and unconstrained schedule quantities that are different than the day-ahead constrained scheduled quantity.

The DA_IOG formulation was recently changed to address inappropriate payments for an import transaction with a day-ahead schedule and subsequently constrained-on in real-time. Please refer to MR-00322 at the following link:

http://www.ieso.ca/imoweb/pubs/mr2006/MR_00322-R00-R01-BA.pdf

Real-Time Intertie Offer Guarantee

There has been a real-time intertie offer guarantee (RT_IOG) mechanism since market commencement. The RT_IOG is comparable to the DA_IOG except that the RT_IOG guarantees that the market participant receives revenues at least equal to its real-time market (i.e. unconstrained) scheduled import quantity multiplied by the real-time offer price.

DA_IOG and RT_IOG Interaction

An import scheduled through the DACP may be eligible for both the DA_IOG and RT_IOG. As part of the DACP design, in this circumstance, the market participant receives the larger of the two IOG payments (refer to section 3.8A.1.2 of chapter 9 of the market rules).

There is a downstream settlement calculation that uses the RT_IOG and DA_IOG values: the IOG Offset. The IOG Offset is intended to ensure that the IOG payment is made for import transactions that benefit Ontario reliability. In the event that an import is eligible for both the DA_IOG and RT_IOG, this offset calculation uses the IOG payment that the market participant actually receives i.e. the larger of the two.

Issue

Under certain conditions, a market participant that has an import scheduled through the DACP and subsequently scheduled in real-time, could receive less revenue than it should given the intent of the IOG payments. Recall that the intent of IOG is that the market participant should receive at least its offer price for the scheduled quantity (constrained schedule quantity in DA_IOG day-ahead and unconstrained schedule quantity in RT_IOG).

Three simple examples are attached (Attachment A) to illustrate the potential for under-payment.

The fundamental reason for this under-payment is that an import transaction that has a DACP schedule and a different real-time schedule is, in effect, both a transaction in the DACP and the real-time market. Settling such an import transaction requires a two-settlement process as is done in other electricity markets, rather than the single settlement mechanisms currently used in the IESO-administered markets.

This issue was presented to the Technical Panel at its meeting on June 13, 2006. At that time, the IESO indicated that the under-payment only occurred when the import transaction was constrained-off in real-time and its real-time schedules were greater than the DACP schedule. Since that discussion, the IESO has determined that the potential for under-payment exists when a DACP scheduled import transaction is constrained-on or off in the real-time market or is not subject to any constraints in the real-time market.

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

Also, at the June 13th meeting, the IESO believed that market participants could avoid the above set of circumstances through changes to import offers and transmission reservations in other markets after the DACP schedules are issued. Since that time, the IESO has determined that market participants could incur costs in other markets to effect those offer and transmission changes. The potential to incur such costs may either discourage market participants from submitting import transactions in the DACP or result in market participants adding a risk premium to the price of import transactions offered into the DACP. Both these consequences would reduce the effectiveness and the expected reliability benefits of the DACP.

From the commencement of the DACP (June 1, 2006) to July 9, 2006, there have been approximately 200 hourly import transactions that have received a DACP schedule. The total settlement amounts for these import transactions (IOG, energy, CMSC payments) were approximately $1.1 million. The IESO has determined that seven of these import transactions were underpaid by a total of ~$11,000.

While the underpayments to date represent only about 1% of the total settlement amounts for imports scheduled through the DACP, the continued risk of under-payment for import transactions scheduled through the DACP may inhibit importers from using the DACP. This outcome would reduce the effectiveness and the expected reliability benefits of the DACP.

Discussion

This amendment proposes to:

- Obligate the IESO to calculate the day-ahead intertie offer guarantee adjustment ($DA\_IOG\{adj\}_{k,h}^{i}$) for each import transaction that receives a DACP schedule (refer to proposed section 3.8A.7);
- Specify the $DA\_IOG\{adj\}_{k,h}^{i}$ as the maximum of zero or the difference between an IOG floor value (IOG_FV) and other market settlement amounts assessed for the import transaction (refer to proposed section 3.8A.7);
- Specify the calculation for the IOG floor value (IOG_FV) (refer to the proposed section 3.8A.8);
- Allow the IESO flexibility to report, distribute and recover the $DA\_IOG\{adj\}_{k,h}^{i}$ on MP settlement statements (refer to proposed section 3.8A.9);

Eligibility

The amendment proposes that the IESO calculate the $DA\_IOG\{adj\}_{k,h}^{i}$ for each import transaction that receives a DACP schedule. Determining the $DA\_IOG\{adj\}_{k,h}^{i}$ for all such imports will simplify IESO implementation and ensure that all import transactions receive the appropriate revenues. The proposed $DA\_IOG\{adj\}_{k,h}^{i}$ and IOG_FV formulations only affect settlement amounts for import transactions that would have been under-paid under the existing settlement formulations.

$DA\_IOG\{adj\}_{k,h}^{i}$ and IOG_FV Formulation

The $DA\_IOG\{adj\}_{k,h}^{i}$ is defined to be the maximum of zero and the difference between a new settlement term, the intertie offer guarantee floor value ($IOG\_FV_{k,h}^{i}$), and the sum of the existing settlement amounts assessed the import transaction. Mathematically this formulation is as follows:

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

$$DA\_IOG\{adj\}_{k,h}^{i} = \quad MAX\ [0\ ,\ IOG\_FV_{k,h}^{i}\ -\ NEMSC_{k,h}^{i}\ -\ MAX(DA\_IOG_{k,h}^{i}\ ,\ RT\_IOG_{k,h}^{i}\ )\ -\ CMSC_{k,h}^{i}\ ]$$

An adjustment to settlement amounts rather than changing the existing DA_IOG formulations is proposed because changing market systems to reflect revised formulations could not be implemented in a timely manner for the current operation of the DACP.

The intertie offer guarantee floor value ($IOG\_FV_{k,h}^{i}$), is defined as the lowest settlement amount that the market participant should receive for the import transaction actually delivered and keep the participant whole to its day-ahead and real-time offer prices for the respective quantities. In simple terms, the $IOG\_FV_{k,h}^{i}$ can be expressed as follows:

The day-ahead offer price multiplied by the minimum of the day-ahead constrained schedule quantity and real-time constrained quantity

plus

The real-time offer price multiplied by the amount by which the real-time constrained schedule quantity exceeds the day-ahead constrained schedule quantity

This revenue floor assures the market participant of receiving its offer price multiplied by the quantity actually delivered.

Mathematically the intertie offer guarantee floor value ($IOG\_FV_{k,h}^{i}$) is defined as:

$$IOG\_FV_{k,h}^{i} = TERM\ 1 + TERM\ 2$$

$$TERM\ 1 = \sum^{T}\left[\sum_{n=1}^{s^*}\left[DA\_B^{t}[n,1]\cdot\left(DA\_B^{t}[n,2] - DA\_B^{t}[n-1,2]\right)\right] + \left[\left(MIN(DQSI_{k,h}^{i,t}, PDR\_DQSI_{k,h}^{i,t}) - DA\_B^{t}[s^*,2]\right)\cdot DA\_B^{t}[s^*+1,1]\right]\right]$$

TERM2 is calculated for each metering inteval 't' where $PDR\_DQSI_{k,h}^{i,t} < DQSI_{k,h}^{i,t}$

$$TERM\ 2 = \sum^{T}\left[\begin{array}{l}\sum_{n=1}^{w^*}\left[RT\_B^{t}[n,1]\cdot\left(RT\_B^{t}[n,2] - RT\_B^{t}[n-1,2]\right)\right] + \left[\left(DQSI_{k,h}^{i,t} - RT\_B^{t}[w^*,2]\right)\cdot RT\_B^{t}[w^*+1,1]\right] - \\ \sum_{n=1}^{x^*}\left[RT\_B^{t}[n,1]\cdot\left(RT\_B^{t}[n,2] - RT\_B^{t}[n-1,2]\right)\right] - \left[\left(PDR\_DQSI_{k,h}^{i,t} - RT\_B^{t}[x^*,2]\right)\cdot RT\_B^{t}[x^*+1,1]\right]\end{array}\right]$$

Term 1 calculates the revenues associated with the day-ahead constrained scheduled quantity. It calculates the revenues by determining the area under the day-ahead offer curve up to the minimum of the day-ahead constrained scheduled quantity (PDR_DQSI) and the real-time constrained scheduled quantity (DQSI). Recall that the DA_IOG is calculated on the minimum of the day-ahead constrained scheduled quantity (PDR_DQSI) and the real-time constrained scheduled quantity (DQSI).

Term 2 calculates the revenues associated with any import energy scheduled and delivered in real-time over and above the quantity scheduled in the DACP. Term 2 is only calculated when the day-ahead constrained scheduled quantity (PDR_DQSI) is less than the real-time constrained scheduled quantity (DQSI). This calculation determines the area under the real-time offer curve up to the real-time schedule quantity (DQSI) and then subtracts the area under the real-time offer curve up to the pre-dispatch of record constrained schedule quantity (PDR-DQSI). This form of the calculation is

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

participant is allowed to adjust its import offer after receiving a day-ahead constrained schedule).

This adjustment would not change the DA_IOG and RT_IOG settlement amounts. The DA_IOG and RT_IOG settlement amounts calculated under the existing market rule formulations would continue to be used for the downstream settlement calculations of the IOG offset. The reason for this is that the automated settlement tools cannot be changed in a timely fashion, but more importantly, any change would potentially require a major modification to settlement amount definitions and tools which would not be compatible with a manual adjustment.

This means that the IOG offset settlement amounts could be incorrect (lower or higher). However, this imprecision is judged to be acceptable, given the expected infrequent need for the adjustment and the small dollar value of the IOG offset. The circumstances required to trigger the proposed adjustment have only occurred in 7 out of 200 hourly import transactions since the DACP has been in place, and on that basis, are expected to be infrequent. The IOG offset amounts are only a small portion of the total IOG settlement amounts. Since DACP has been in place, the IOG offset represents less than 5% of the total ~$2 million DA_IOG and RT_IOG payments for all import transactions (imports scheduled in DACP and/or real-time). The imprecision in the IOG offset would represent a small portion of the 5% of the total IOG settlement amounts.

Flexibility

The IESO will manually determine the $IOG\_FV_{k,h}^{i}$ and $DA\_IOG\{adj\}_{k,h}^{i}$. As a result, it is expected that the IESO would report, distribute and recover $DA\_IOG\{adj\}_{k,h}^{i}$ for a given month on the settlement statements for the last trading day of the month as a non-hourly uplift settlement amount. However, depending on the volume of required adjustments and experience gained, it may be possible for the IESO to report the IOG adjustments on the settlement statements for the applicable trading day. Allowing the IESO the flexibility to report, recover and distribute the IOG adjustments is appropriate given that the number of instances where adjustments will be required is not known and is expected to be small.

PART 4 – PROPOSED AMENDMENT

3.8A Hourly Settlement Amounts for Intertie Offer Guarantees

…….

Day-Ahead Intertie Offer Guarantee Adjustments

3.8A.7 For each *market participant* that receives a constrained schedule for an import transaction in the *pre-dispatch of record*, the *IESO* shall determine a day-ahead intertie *offer* guarantee adjustment *settlement amount* ($DA\_IOG\{adj\}_{k,h}^{i}$) for that import transaction. The day-ahead intertie offer guarantee adjustment *settlement amount* is equal to the greater of zero and:

- the intertie offer guarantee floor value ($IOG\_FV_{k,h}^{i}$) determined for that import transaction, minus
- the sum of the applicable *settlement amounts* determined for that import transaction.

The $DA\_IOG\{adj\}_{k,h}^{i}$ shall be formulated as follows:

$$DA\_IOG\{adj\}_{k,h}^{i} = MAX [0 , IOG\_FV_{k,h}^{i} - NEMSC_{k,h}^{i} - MAX(DA\_IOG_{k,h}^{i}, RT\_IOG_{k,h}^{i}) - CMSC_{k,h}^{i}]$$

Where:

$IOG\_FV_{k,h}^{i}$ is the intertie offer guarantee floor value determined under section 3.8A.9;

$NEMSC_{k,h}^{i}$ is that portion of the net energy market settlement credit applicable to the import transaction for *market participant* 'k' for *settlement hour* 'h' at *intertie metering point* 'i' as determined in accordance with section 3.3.2.1

$DA\_IOG_{k,h}^{i}$ is that portion of the day-ahead *intertie offer* guarantee *settlement* credit applicable to the import transaction for *market participant* 'k' for *settlement hour* 'h' at *intertie metering point* 'i'

$RT\_IOG_{k,h}^{i}$ is that portion of the real-time *intertie offer* guarantee *settlement* credit applicable to the import transaction for *market participant* 'k' for *settlement hour* 'h' at *intertie metering point* 'i' as determined in accordance with section 3.8A.2; and

$CMSC_{k,h}^{i}$ is that portion of the congestion management *settlement* credit applicable to the import transaction for *market participant* 'k' for *settlement hour* 'h' at *intertie metering point* 'i' as determined in accordance with section 3.5.2.1 and specifically that component applicable to a constraint on *energy* ($OPE_{k,h}^{i}$)

3.8A.8 The *IESO* shall determine the *intertie offer* guarantee floor value ($IOG\_FV_{k,h}^{i}$) referred to in section 3.8A.7 from:

- the day-ahead *offer prices* for the import transaction submitted by the *market participant* over the range of the *pre-dispatch of record* constrained quantity scheduled for that import transaction; and
- *real-time offer prices* for the import transaction at the corresponding location in the corresponding *settlement hour* for any additional *energy* scheduled above and beyond the *pre-dispatch of record* constrained quantity scheduled for that import transaction:

The $IOG\_FV_{k,h}^{i}$ shall be formulated as follows:

$$IOG\_FV_{k,h}^{\ i} = TERM\ 1 + TERM\ 2$$

$$TERM\ 1 = \sum^{T}\left[\sum_{n=1}^{s^*}\left[DA\_B^{t}[n,1]\cdot\left(DA\_B^{t}[n,2]-DA\_B^{t}[n-1,2]\right)\right]+\left[\left(MIN(DQSI_{k,h}^{\ i,t}, PDR\_DQSI_{k,h}^{\ i,t})-DA\_B^{t}[s^*,2]\right)\cdot DA\_B^{t}[s^*+1,1]\right]\right]$$

TERM2 is calculated for each metering interval 't' where $PDR\_DQSI_{k,h}^{\ i,t} < DQSI_{k,h}^{\ i,t}$

$$TERM\ 2 = \sum^{T}\left[\begin{array}{l}\sum_{n=1}^{w^*}\left[RT\_B^{t}[n,1]\cdot\left(RT\_B^{t}[n,2]-RT\_B^{t}[n-1,2]\right)\right]+\left[\left(DQSI_{k,h}^{\ i,t}-RT\_B^{t}[w^*,2]\right)\cdot RT\_B^{t}[w^*+1,1]\right]- \\ \sum_{n=1}^{x^*}\left[RT\_B^{t}[n,1]\cdot\left(RT\_B^{t}[n,2]-RT\_B^{t}[n-1,2]\right)\right]-\left[\left(PDR\_DQSI_{k,h}^{\ i,t}-RT\_B^{t}[x^*,2]\right)\cdot RT\_B^{t}[x^*+1,1]\right]\end{array}\right]$$

Where:

"T' is the set of all *metering intervals* 't' in *settlement hour* 'h';

''DA_B' is matrix $PDR\_BE_{k,h}^{\ i,t}$: *energy offers* submitted into the *pre-dispatch of record*, represented as an N by 2 matrix of *price-quantity pairs* for each *market participant* 'k' at *intertie metering point* 'i' during *metering interval* 't' of *settlement hour* 'h' arranged in ascending order by the offered price in each *price-quantity pair* where offered prices are in column 1 and offered quantities are in column 2.

'RT_B^{t}' is matrix $BE_{k,h}^{\ i,t}$ of N *price-quantity pairs* offered by *market participant* 'k' to supply energy from a particular *boundary entity* associated with an *intertie metering point* 'i' in the *IESO-administered markets*, during *metering interval* 't'

of *settlement hour* 'h' arranged in ascending order by offered price where offered prices are in column 1 and offered quantities are in column 2.

s* is the highest indexed row of matrix DA_B such that DA_B[s*,2] ≤ MIN($DQSI_{k,h}^{i,t}$, $PDR\_DQSI_{k,h}^{i,t}$) ≤ DA_B[N,2] and where, DA_B[0,2] =0

w* is the highest indexed row of matrix RT_B^t such that RT_B^t [w*,2] ≤ $DQSI_{k,h}^{i,t}$ ≤ RT_B^t[N,2] and where, RT_B^t[0,2] =0

x* is the highest indexed row of matrix RT_B^t such that RT_B^t[x*,2] ≤ $PDR\_DQSI_{k,h}^{i,t}$ ≤ RT_B^t[N,2] and where, RT_B^t[0,2] =0

3.8A.9 The *IESO* shall report the intertie offer guarantee adjustment *settlement amount* specified in section 3.8A.7 in a manner and at the times specified in the applicable *market manual*; distribute and recover such *settlement amounts* in a manner and at the times specified in the applicable *market manual*.

PART 5 – IESO BOARD DECISION RATIONALE

This top-up payment is required as the current market rule settlements could result in under-payments for import transactions scheduled through the DACP. Risk of these under-payments could be a disincentive for market participants to schedule import transactions through the DACP, which would be contrary to the intent of the DACP.

Attachment A

Examples of Intertie Offer Guarantee Underpayment

Example 1 – No Real-Time Constraints

Inputs	Symbol	Value	Formulation
Day-Ahead Constrained Schedule Qty (MW)	PDR_DQSI	30	
Day-Ahead Offer Price ($/MW)	DA_OP	90.00	
Real-Time Offer Price ($/MW)	RT_OP	20.00	
Real-Time Constrained Qty (MW)	DQSI	100	
Real-Time Unconstrained (Market) Qty (MW)	MQSI	100	
Real-Time Energy Market Price ($/MW)	RT_EMP	10.00	
Settlement Amount Calculations ($)			
Real-Time Energy Payment	NEMSC	1000.00	DQSI x RT_EMP
Real-Time CMSC	CMSC	0.00	(MQSI-DQSI) x (RT_EMP-RT_OP)
Day-Ahead Intertie Offer Guarantee	DA_IOG	2400.00	MAX(0,MIN(PDR_DQSI,DQSI) x (DA_OP - RT_EMP) - CMSC)
Real-Time Intertie Offer Guarantee	RT_IOG	1000.00	MAX(0,MQSI x (RT_OP - RT_EMP))
IOG Reversal		1000.00	MIN(DA_IOG,RT_IOG)
Total Settlement Amount		3400.00	NEMSC + CMSC + DA_IOG + RT_IOG - IOG Reversal
Settlement Amount the MP Should Receive		4100.00	(PDR_DQSI x DA_OP) + ((DQSI - PDR_DQSI) x RT_OP)
Under-Payment		700.00	

In this example, the import transaction receives a 30 MW day-ahead constrained schedule (PDR_DQSI), a 100 MW real-time unconstrained (MQSI) and constrained (DQSI) schedule of 100 MW i.e. the import transaction is not constrained in real-time. The individual settlement amounts, using the existing market rule formulation results in a total payment of $3400 to the market participant. In this scenario, the IOG reversal removes the entire RT_IOG payment, including the RT_IOG payment associated with the real-time scheduled quantity above the day-ahead scheduled quantity.

However, taking into account the day-ahead and real-time offer prices, the real-time market prices and the intent of the IOG payments, the market participant should receive a net settlement amount of $4100. This net amount is determined by “the day-ahead schedule times their day-ahead offer price” plus “the real-time constrained schedule quantity times the real-time offer price”. In other words, the market participant is entitled to, but does not receive, the RT_IOG revenues associated with the real-time scheduled quantity above the day-ahead scheduled quantity.

Attachment A (continued)

Example 2 – Import Transaction Constrained-Off in Real-Time

Inputs	Symbol	Value	Formulation
Day-Ahead Constrained Schedule Qty (MW)	PDR_DQSI	30	
Day-Ahead Offer Price ($/MW)	DA_OP	90.00	
Real-Time Offer Price ($/MW)	RT_OP	20.00	
Real-Time Constrained Qty (MW)	DQSI	55	
Real-Time Unconstrained (Market) Qty (MW)	MQSI	100	
Real-Time Energy Market Price ($/MW)	RT_EMP	10.00	
Settlement Amount Calculations ($)			
Real-Time Energy Payment	NEMSC	550.00	DQSI x RT_EMP
Real-Time CMSC	CMSC	-450.00	(MQSI-DQSI) x (RT_EMP-RT_OP)
Day-Ahead Intertie Offer Guarantee	DA_IOG	2850.00	MAX(0,MIN(PDR_DQSI,DQSI) x (DA_OP - RT_EMP) - CMSC)
Real-Time Intertie Offer Guarantee	RT_IOG	1000.00	MAX(0,MQSI x (RT_OP - RT_EMP))
IOG Reversal		1000.00	MIN(DA_IOG,RT_IOG)
Total Settlement Amount		2950.00	NEMSC + CMSC + DA_IOG + RT_IOG - IOG Reversal
Settlement Amount the MP Should Receive		3200.00	(PDR_DQSI x DA_OP) + ((DQSI - PDR_DQSI) x RT_OP)
Under-Payment		250.00	

In this example, the import transaction receives a 30 MW day-ahead constrained schedule (PDR_DQSI), a 100 MW real-time unconstrained schedule (MQSI) but is subsequently constrained-off such that it receives a 55 MW real-time constrained schedule (DQSI). The individual settlement amounts, using the existing market rule formulation results in a total payment of $2950 to the market participant. Again in this scenario, the IOG reversal removes the entire RT_IOG payment, including the RT_IOG payment associated with the real-time scheduled quantity above the day-ahead scheduled quantity.

However, taking into account the day-ahead and real-time offer prices, the real-time market prices and the intent of the IOG payments, the market participant should receive a net settlement amount of $3200. This net amount is determined by “the day-ahead schedule times their day-ahead offer price” plus “the real-time constrained schedule quantity times the real-time offer price”. In other words, the market participant is entitled to the RT_IOG revenues associated with the real-time scheduled quantity above the day-ahead scheduled quantity.

Attachment A (continued)

Example 3 – Import Transaction Constrained-On in Real-Time

Inputs	Symbol	Value	Formulation
Day-Ahead Constrained Schedule Qty (MW)	PDR_DQSI	30	
Day-Ahead Offer Price ($/MW)	DA_OP	90.00	
Real-Time Offer Price ($/MW)	RT_OP	20.00	
Real-Time Constrained Qty (MW)	DQSI	100	
Real-Time Unconstrained (Market) Qty (MW)	MQSI	55	
Real-Time Energy Market Price ($/MW)	RT_EMP	10.00	
Settlement Amount Calculations ($)			
Real-Time Energy Payment	NEMSC	1000.00	DQSI x RT_EMP
Real-Time CMSC	CMSC	450.00	(MQSI-DQSI) x (RT_EMP-RT_OP)
Day-Ahead Intertie Offer Guarantee	DA_IOG	1950.00	MAX(0,MIN(PDR_DQSI,DQSI) x (DA_OP - RT_EMP) - CMSC)
Real-Time Intertie Offer Guarantee	RT_IOG	550.00	MAX(0,MQSI x (RT_OP - RT_EMP))
IOG Reversal		550.00	MIN(DA_IOG,RT_IOG)
Total Settlement Amount		3400.00	NEMSC + CMSC + DA_IOG + RT_IOG - IOG Reversal
Settlement Amount the MP Should Receive		4100.00	(PDR_DQSI x DA_OP) + ((DQSI - PDR_DQSI) x RT_OP)
Under-Payment		700.00	

In this example, the import transaction receives a 30 MW day-ahead constrained schedule (PDR_DQSI), a 55 MW real-time unconstrained schedule (MQSI) but is subsequently constrained-on such that it receives a 100 MW real-time constrained schedule (DQSI). The individual settlement amounts, using the existing market rule formulation results in a total payment of $3450 to the market participant. Again in this scenario, the IOG reversal removes the entire RT_IOG payment, including the RT_IOG payment associated with the real-time scheduled quantity above the day-ahead scheduled quantity.

However, taking into account the day-ahead and real-time offer prices, the real-time market prices and the intent of the IOG payments, the market participant should receive a net settlement amount of $4100. This net amount is determined by “the day-ahead schedule times their day-ahead offer price” plus “the real-time constrained schedule quantity times the real-time offer price”. In other words, the market participant is entitled to the RT_IOG revenues associated with the real-time unconstrained scheduled quantity above the day-ahead scheduled quantity.