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## Market Rule Amendment Proposal

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### PART 1 – MARKET RULE INFORMATION

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|-------------------------------------|---|-----------------------------------|--|
| Identification No.:                 | MR-00402  |                                   |  |
| Subject:                            | Renewable Integration Initiative  |                                   |  |
| Title:                              | Market Schedule and Congestion Management Settlement Credits for Variable Generation – Market Rules True-Up   |                                   |  |
| Nature of Proposal:                 | <input checked="" type="checkbox"/> Alteration  | <input type="checkbox"/> Deletion | <input checked="" type="checkbox"/> Addition |
| Chapter:                            | 7, 9  | Appendix:                         |  |
| Sections:                           | Chapter 7, sections 6.4.2.9A, 6.4.2.9B (new), Chapter 9, sections 3.5.1E.2, 3.5.1F (new), 3.5.2, 3.5.2A (new) |                                   |  |
| Sub-sections proposed for amending: |   |                                   |  |

### PART 2 – PROPOSAL HISTORY

| Version                              | Reason for Issuing   | Version Date   |
|--------------------------------------|--|----------------|
| 1.0                                  | Draft for Technical Panel review   | March 19, 2013 |
| 2.0                                  | Publish for Stakeholder Review and Comment   | March 28, 2013 |
| 3.0                                  | Submitted for Technical Panel Vote   | April 23, 2013 |
| 4.0                                  | Recommended by Technical Panel; Submitted for IESO Board Approval  | April 30, 2013 |
| 5.0                                  | Approved by IESO Board   | June 13, 2013  |
|                                      |  |                |
|                                      |  |                |
| Approved Amendment Publication Date: | June 13, 2013  |                |
| Approved Amendment Effective Date:   | The effective date is anticipated to be in the third/fourth quarter of 2013, and shall be specified by the Chief Executive Officer of the IESO in a notice to all market participants. |                |

### 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 proposal specifies the use of a telemetry snapshot of a variable generation facility's actual energy output, taken at the end of a dispatch interval, in the IESO's determination of the market schedule and price for the interval for which that variable generation facility is operating under a release notification. The market schedule quantity determined for each facility will be used for all settlement purposes including congestion management settlement credits (CMSC) for variable generators that are registered market participants.

In addition, it is proposed to establish a new formula for CMSC in those dispatch intervals for which a variable generation facility is operating under a release notification and when the facility is partially or fully uneconomic in the market schedule.

This proposal is based on stakeholder consultation as part of SE-91 Renewable Integration.

Further information on SE-91 can be found on the IESO's website at:

[http://www.ieso.ca/imoweb/consult/consult\\_se91.asp](http://www.ieso.ca/imoweb/consult/consult_se91.asp)

#### Background

On November 29, 2012, the IESO Board approved [MR-00381-R04: Market Schedule and CMSC for Variable Generation](#) which specifies the use of a 5-minute forecast produced by the forecasting entity in the IESO's determination of the market schedule and CMSC for variable generators that are registered market participants. In the previous market schedule/CMSC design under MR-00381-R04, variable generators were only eligible for CMSC when operating under a dispatch instruction, and ineligible for CMSC while operating under a release notification.

Under a release notification, a facility has been directed by the IESO to generate to the maximum output that ambient fuel conditions allow. In such a dispatch interval, the best reflection of the maximum capability for the facility is a telemetry snapshot taken at the end of an interval. The unconstrained sequence can then schedule the variable generation facility to any amount that is less than or equal to that snapshot.

While operating under a release notification, the unconstrained sequence may yield a market clearing price such that the variable generator is uneconomic in the market schedule and is producing at a price that is lower than their offer price. In constrained-on situations (i.e. where the constrained schedule

**PART 3 – EXPLANATION FOR PROPOSED AMENDMENT**

quantity is greater than the market schedule quantity), it is necessary to calculate CMSC in order to ensure that the variable generator is held whole to their offer price, as per other generators in the market.

**Discussion**

In a dispatch interval for which a variable generation facility is operating subject to a release notification, the market schedule for that dispatch interval will be no greater than the least of the following three amounts:

- (i) the highest quantity reflected in the facility's submitted energy offers;
- (ii) the facility's full capacity less submitted outages; or
- (iii) a telemetry snapshot of the facility's energy output taken at the end of the interval.

In such intervals, and where the market schedule for the facility is less than the least of each of the three amounts above, the CMSC calculation will compare the variable generation facility's operating profit deemed to have been made in that market schedule to the operating profit deemed to have been made based on the quantity of energy injected over the course of that same interval.

Market Schedule:

The following changes are proposed in Chapter 7:

## Section 6.4.2.9B (new):

- Specify that for a variable generator that is a registered market participant, if the registered facility is issued a release notification by the IESO (in accordance with section 7.1) which remains in effect for any dispatch interval, the quantity of energy in the market schedule for that dispatch interval shall be limited to reflect the least of: (i) the highest quantity reflected in the facility's submitted energy offers; (ii) the facility's full capacity less submitted outages; or (iii) the output level, as determined by operational metering, of the registered facility at the end of the applicable dispatch interval (i.e. the telemetry snapshot).

## Section 6.4.2.9A:

- Existing wording in 6.4.2.9A (MR-00381:R04): for further clarity and consistency with 6.4.2.9B (new), the wording "the maximum MW energy level associated with" energy offers "submitted for the registered facility, the registered facility's full capacity less submitted" outages has been added.

CMSC:

The following changes are proposed in Chapter 9:

## Section 3.5.1F (new):

- Specify that for variable generators that are registered market participants, if the registered facility is subject to a release notification for any given dispatch interval, and for that same dispatch interval the facility's market schedule quantity (MQSI) is less than the corresponding quantity in the constrained schedule (DQSI) as a result of the market participant's offers being partially or fully uneconomic, the CMSC for those dispatch intervals shall be calculated as the difference between the operating profit based on the market schedule quantity injected (MQSI)

**PART 3 – EXPLANATION FOR PROPOSED AMENDMENT**

in accordance with section 6.4.2.9B of Chapter 7 and the operating profit calculated based on actual injections (AQEI).

## Section 3.5.1E.2:

- Specify that variable generators that are registered market participants shall be ineligible for CMSC in dispatch intervals where the registered facility was issued a release notification, or for which a release notification remains in effect, unless the conditions in section 3.5.1F (new) are met.
- Existing wording in 3.5.1E.2 (MR-00381:R04): for clarity, the wording “is not required to follow dispatch instructions issued by the IESO” will be replaced with “is issued a release notification by the IESO in accordance with section 7.1, which remains in effect for any dispatch interval.”

## Sections 3.5.2A (new), 3.5.2:

- Specify that subject to section 3.5.1F (new), the standard  $OPE_{k,h}$  equation in section 3.5.2 will be modified for variable generators that are registered market participants and equal to the difference between the operating profit in the market schedule less the operating profit based on energy actually injected.
- Consequential to the above change, a cross-reference to 3.5.1F (new) has been added to existing section 3.5.2.

**PART 4 – PROPOSED AMENDMENT**

## Chapter 7

**6. The Real-Time Scheduling Process****6.4 Market Schedules and Market Prices**

6.4.2 Subject to section 8.4A for the purpose of determining the *market schedule* and *market prices* for any *dispatch interval*, the *IESO* shall use the same information and data used for determining the *real-time schedule* for that *dispatch interval*, except that:

6.4.2.1 the unconstrained *IESO-controlled grid* model shall be used;

6.4.2.2 subject to section 3.1.2 of Appendix 7.5, the initial conditions to be used for any *dispatch interval* in the *market schedule* shall be the final conditions of the *market schedule* for the preceding *dispatch interval*;

- 6.4.2.3 the total demand (including losses) to be satisfied within a *dispatch interval* in the *market schedule* shall be set at the *IESO's* best estimate of its actual value, as determined from real-time system data;
- 6.4.2.4 total system *energy* losses determined in the *real-time schedule* shall be represented as an increase in *non-dispatchable load* within the *IESO control area*;
- 6.4.2.5 any *registered facility* in respect of which a *forced outage* has been detected during a *dispatch interval* shall be recognized by an adjustment to the input data;
- 6.4.2.6 subject to section 6.4.2A, the estimated deviations between scheduled quantities and actual quantities shall be represented as a change in *non-dispatchable load* in the *IESO control area*;
- 6.4.2.7 subject to section 6.4.2A, the *market schedule* shall reflect dispatch adjustments computed using scheduled injections from the *constrained schedule*, outlined in Appendix 7.5;
- 6.4.2.8 in accordance with section 4.13.1 of Appendix 7.5, the *market schedule* may use different trading period length to that of the *real-time schedule*;
- 6.4.2.9 in accordance with section 2.11.2 of Appendix 7.5, the *market schedule* may use a different ramp rate for *operating reserve* to that of the *real-time schedule*;

**Note: Section 6.4.2.9A (MR-00381-R04) was approved by the IESO Board on November 29, 2012 and is anticipated to become effective in the third quarter of 2013.**

- 6.4.2.9A for a *variable generator* that is a *registered market participant*, if the *registered facility* is issued a *dispatch instruction* by the *IESO* in accordance with section 7.1, the quantity of *energy* scheduled for injection in the *market schedule* for the applicable *dispatch intervals* shall be limited to reflect the least of the maximum MW energy level associated with energy offers submitted for the registered facility, the registered facility's full capacity less submitted outages, and the forecast of energy produced by the forecasting entity for the registered facility; and

- 6.4.2.9B for a variable generator that is a registered market participant, if the registered facility is issued a release notification by the IESO in accordance with section 7.1, which remains in effect for any dispatch interval, the quantity of energy scheduled for injection in the market schedule for the applicable dispatch intervals shall be limited to reflect

the least of the maximum MW energy level associated with energy offers submitted for the registered facility, the registered facility's full capacity less submitted outages, and the instantaneous energy output of the registered facility, as represented by its operating result for that facility, recorded at the end of each applicable dispatch interval as referred to in this section.

## Chapter 9

### 3.5 Hourly Settlement Amounts for Congestion Management

3.5.1 The *dispatch instructions* provided by the *IESO* to market participant 'k' will sometimes instruct k to deviate from its *market schedule* in ways that, based on market participant 'k's *offers* and *bids*, imply a change to market participant 'k's net operating profits relative to the operating profits implied by market participant 'k's *market schedule*. When this occurs and market participant 'k' responds to the *IESO's dispatch instructions*, market participant 'k' shall, subject to Appendix 7.6 of Chapter 7, receive as compensation a *settlement credit* equal to the change in implied operating profits resulting from such response, calculated in accordance with section 3.5.2. If market participant 'k' does not fully or accurately respond to its *dispatch instructions* from the *IESO*, the compensation paid to market participant 'k' shall be altered as set forth in this section 3.5, or as otherwise specified by the *IESO*.

3.5.1A A registered market participant for a registered facility that is a dispatchable load is not entitled to a congestion management settlement credit determined in accordance with section 3.5.2 where that registered facility's DQSW is less than the corresponding MQSW at that location for the same metering interval as the result of that registered facility's own equipment or operational limitations, if:

- 3.5.1A.1 that registered facility does not fully or accurately respond to its *dispatch instructions*; or
- 3.5.1A.2 the ramping capability of that registered facility, as represented by the ramp rate set out in the *offers* or *bids*, is below the threshold for the *IESO* to modify *dispatch instructions* and thereby prevents changes to the *dispatch*;

and then the *IESO* may withhold or recover such congestion management settlement credits and shall redistribute any recovered payments in accordance with section 4.8.2 of Chapter 9.

3.5.1B A *market participant* shall not be *invoiced* congestion management settlement credits for an export transaction if that transaction attracted the congestion management settlement credits under the following conditions:

3.5.1B.1 the net *interchange schedule* limit is binding in the *market schedule* on an economic export transaction in pre-dispatch, and subsequently, in accordance with section 6.1.3 of Chapter 7, the *IESO* increases the quantity of that transaction in the *real-time schedule*; or

3.5.1B.2 the net *interchange schedule* limit is binding in the *market schedule* on an uneconomic export transaction in pre-dispatch, and subsequently, in accordance with section 6.1.3 of Chapter 7, the *IESO* decreases the quantity of that transaction in the *real-time schedule*.

The amount of congestion management settlement credits referred to in this section is limited to the portion of the transaction that is modified by the *IESO*.

3.5.1C [Intentionally left blank – section deleted]

3.5.1D A *registered market participant* for a *registered facility* that is a *dispatchable load* shall not be entitled to a congestion management *settlement* credit determined in accordance with section 3.5.2 for *settlement hour* ‘h’ where:

3.5.1D.1 the *price-quantity pairs* contained in the *energy bid* associated with that *registered facility* for *settlement hour* ‘h’ are not identical to the *price-quantity pairs* in the *energy bid* associated with the same *registered facility* for the applicable preceding *settlement hour* or following *settlement hour*;

3.5.1D.2 the change in *energy bid* as referred to in section 3.5.1D.1 results in a change in the quantity scheduled in the *market schedule* for that *registered facility* as described in the applicable *market manual*;

3.5.1D.3 the change in *energy bid* as referred to in section 3.5.1D.1 results in the ramping of the that *registered facility* as described in the applicable *market manual*; and

3.5.1D.4 that *registered facility*’s DQSW is less than the corresponding MQSW at that location for any *metering interval* falling within *settlement hour* ‘h’.

**Note: Section 3.5.1E (MR-00381-R04) was approved by the IESO Board on November 29, 2012 and is anticipated to become effective in the third quarter of 2013.**

3.5.1E For the purpose of calculating congestion management *settlement* credits for *variable generators* that are *registered market participants*:

3.5.1E.1 if the *registered facility* is required to follow *dispatch instructions* issued by the *IESO* for any given *dispatch intervals*, the corresponding congestion management *settlement credits* for those *dispatch intervals* shall be calculated using the *market schedule* quantity determined in accordance with section 6.4.2.9A of Chapter 7; and

3.5.1E.2 except as noted in section 3.5.1F, the *market participant* shall not be eligible for congestion management *settlement credits* in *dispatch intervals* where the *registered facility* is issued a *release notification* by the *IESO* in accordance with section 7.1, which remains in effect for any *dispatch interval*~~is not required to follow *dispatch instructions* issued by the *IESO*.~~

3.5.1F For the purpose of calculating congestion management *settlement credits* for *variable generators* that are *registered market participants*, if the *registered facility* is subject to a *release notification* for a given *dispatch interval*, and for that *dispatch interval* the *registered facility*'s  $MQSI_{k,h}^{m,t}$  is less than the corresponding  $DQSI_{k,h}^{m,t}$  for the same *dispatch interval* as a result of the *market participant's energy offers* being partially or fully uneconomic in the unconstrained schedule relative to the constrained schedule, the congestion management *settlement credits* for that *dispatch interval* shall be calculated pursuant to section 3.5.2A using the difference between the operating profit based on the *market schedule* quantity  $MQSI_{k,h}^{m,t}$  determined in accordance with section 6.4.2.9B of Chapter 7 and the operating profit calculated based on the *allocated quantity of energy* injected (*AQEI*) for the same *dispatch interval*.

3.5.2 Subject to sections 3.5.1A, 3.5.1D, 3.5.1E, 3.5.1F, 3.5.6, 3.5.6A, 3.5.6B, 3.5.6C, 3.5.6D and 3.5.9 and subject to Appendix 7.6 of Chapter 7, the hourly congestion management *settlement credit* for *market participant* 'k' for *settlement hour* 'h' (" $CMSC_{k,h}$ ") shall be determined by the following equation:

3.5.2A For purposes of section 3.5.1F, for *variable generators* that are *registered market participants*, the  $OPE_{k,h}$  equation in section 3.5.2 shall be calculated as follows:

$$OPE_{k,h} = \sum_{m,t} \left[ OP(EMP_h^{m,t}, MQSI_{k,h}^{m,t}, BE) - OP(EMP_h^{m,t}, AQEI_{k,h}^{m,t}, BE) \right]$$

**PART 5 – IESO BOARD DECISION RATIONALE**

As part of the renewable integration design, this amendment is a component of the IESO's ability to actively dispatch all variable generators that are registered market participants through the five-minute security constrained economic dispatch, which is an essential tool for the IESO to maintain system reliability and market efficiency.