Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00381			
Subject:	Renewable Integration Initiative			
Title:	Tie Breaking for Variable Generation			
Nature of Proposal:	☒ Alteration	☐ Deletion	☒ Addition	
Chapter:		Appendix:	7.5	
Sections:	Appendix 7.5, sections 2.4.5, 2.4.6 (new), 2.8.1, 2.8.4 (new), 2.8.5 (new)			
Sub-sections proposed for amending:				

PART 2 – PROPOSAL HISTORY

Version	Reason for Issuing	Version Date
1.0	Draft for Technical Panel review	August 14, 2012
2.0	Publish for Stakeholder Review and Comment	August 23, 2012
3.0	Submitted for Technical Panel Vote	September 21, 2012
4.0	Recommended by Technical Panel; Submitted for IESO Board Approval	October 16, 2012
5.0	Approved by IESO Board	November 29, 2012

Approved Amendment Publication Date:	January 3, 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 submission proposes to obligate the IESO to apply a uniform penalty factor and to randomly determine a daily dispatch order for variable generators that are registered market participants. In addition, the IESO will be required to regularly update and publish this daily dispatch order report.

This proposal is based on stakeholder consultation as part of SE-91 Renewable Integration which includes the Dispatch Technical Working Group (DTWG) and the Floor Price Focus Group (FPFG).

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

http://www.ieso.ca/imoweb/consult/consult_se91.asp

Background

As part of the renewable integration design, the IESO will actively dispatch all variable generation[1] directly connected to the IESO-controlled grid and those embedded variable resources that are registered market participants through the five-minute security constrained economic dispatch.

As part of MR-00381-R03: Floor Prices for Variable and Nuclear Generation, the IESO is proposing to establish floor prices for variable generators that are registered market participants. In the absence of transmission constraints, given the proposal to implement a uniform floor price for all variable generators, if all variable generators were to offer at the floor price the existing tie breaking methodology would dispatch them in the same order every time based on their loss penalty factors[2].

In consultation with stakeholders through the DTWG/SE-91, the IESO's intent is to achieve a more equitable solution regarding the dispatch order for variable generators over the long-term via the following mechanism:

- Set all variable generator loss penalty factors at a uniform number (e.g. 1.00 for all variable generators);
- In order to address operational concerns caused by setting a uniform loss penalty factor (for example if a large number of generators each receive a dispatch within their compliance

[1] Market Rules, Chapter 11 Definition: *variable generation* means all wind and solar photovoltaic resources with an installed capacity of 5MW or greater, or all wind and solar photovoltaic resources that are directly connected to the *IESO-controlled grid.*

[2] Loss penalty factors are the determining factor in tie breaking, and are assigned to each generator and published on the IESO website. Effective Cost = Offer Price x Loss Penalty Factor

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

deadbands), it is proposed to:

- Obligate the IESO to randomly generate a daily dispatch order for a specified period (e.g. the daily report will detail the dispatch order for the upcoming 3 calendar months);
- This 3-month dispatch order will be updated regularly (e.g. on a monthly basis);
- The randomly generated dispatch order report will be published on the IESO website.

Discussion

Uniform Penalty Factor for Variable Generation

The following changes are proposed in Appendix 7.5, sections 2.4.5 and 2.4.6 (new) to specify that:

- 2.4.6 (new): The IESO shall apply a uniform penalty factor to variable generators that are registered market participants. As a result, in the absence of any transmission constraints, all variable generators will proportionately share the dispatch requirement. Operational concerns related to this result are addressed by the randomly determined dispatch order below.
- 2.4.5: A cross reference to section 2.4.6 (new) is proposed in this section as a consequence of the addition above.

Tie Breaking

The following change is proposed in Appendix 7.5 to specify that:

- 2.8.4 (new): The IESO shall randomly determine a daily dispatch order for variable generators that are registered market participants, and shall regularly update and publish such daily dispatch order in accordance with the applicable market manual (Market Manual 4.3: Real-Time Scheduling of the Physical Markets). The market manual will detail the process, time horizon of the report (e.g. a 3 month time horizon), and the frequency that the report will be updated (e.g. every network model build which typically occurs monthly). New months will be appended to the existing list, and new generators will be placed at the bottom of the order until a new month is published. The new daily order will take effect for HE16 (to coincide with the first run of pre-dispatch), and will apply to the Day-Ahead Commitment Process (DACP), pre-dispatch and real-time schedules.

- 2.8.1: A cross reference to section 2.8.4 (new) is proposed in this section to specify that the tie-breaking mechanism for variable generators will be modified from that of other generators.
- 2.8.5 (new): For variable generators that are registered market participants, if two or more energy offers have the same offer price resulting in no differences in the cost to the IESO-administered market of utilizing any of the offers, the IESO will break the tie by using the daily dispatch order determined in accordance with section 2.8.4.

PART 4 – PROPOSED AMENDMENT

Appendix 7.5 – The Market Clearing and Pricing Process

2.4 The IESO-Controlled Grid

2.4.1 The *dispatch* scheduling and pricing process shall represent power flow relationships between locations on the *IESO-controlled grid* and between the *IESO control area* and adjoining *control areas*.

2.4.2 The *dispatch* scheduling and pricing process shall utilise a security-constrained optimal power flow with explicit representation of electrical flows on each transmission element.

2.4.3 Limits on transmission flows in either direction of flow shall be explicitly represented.

2.4.4 Security constraints may limit *generation facility* output and *dispatchable load* or any other variable so as to represent the *security limits* applicable to the *IESO-controlled grid*.

2.4.5 Subject to section 2.4.6, t~~T~~he *IESO* shall estimate static transmission losses and model transmission losses using penalty factors. The *IESO* shall adjust *bid* and *offer* prices using the applicable penalty factor. The *IESO* shall notify *market participants* in a timely manner of any changes to the applicable penalty factors.

2.4.6 The *IESO* shall apply a uniform penalty factor to *variable generators* that are *registered market participants*.

2.8 Tie-Breaking

2.8.1 Except as otherwise noted in section 2.8.5, i~~I~~f two or more *energy offers* have the same *offer* price and interactions with the *operating reserve market* do not create differences in the cost to the market of utilising each *offer*, the schedules from these *offers* shall be prorated based on an adjusted amount of *energy offered* at that *offer price*. The adjustment shall reflect the current capability of the *facility* by including any current limitations on the *facility* e.g. ramping, deratings.

2.8.2 If two or more *energy bids* have the same *bid* price and interactions with the *operating reserve market* do not create differences in the cost to the market as a whole of utilising each *bid*, the schedules from these *bids* shall be prorated based on an adjusted amount of *energy bid* at that *bid* price. The adjustment shall reflect

the current capability of the *facility* by including any current limitations on the *facility* e.g. ramping, deratings.

2.8.3 If two or more *offers* for a given class of *operating reserve* have the same *offer* price and provided that interactions with the *energy* market and markets for other classes of *operating reserve* do not create differences in the cost to the market as a whole of utilising each *offer*, then the schedules from these *offers* shall be prorated based on an adjusted amount of *operating reserve offered* at that *offer* price. The adjustment shall reflect the current capability of the *facility* by including any current limitations on the *facility* e.g. ramping, deratings.

2.8.4 The *IESO* shall randomly determine a daily *dispatch* order for *variable generators* that are *registered market participants*, and shall regularly update and publish such daily *dispatch* order in accordance with the applicable *market manual*.

2.8.5 For *variable generators* that are *registered market participants*, if two or more *energy offers* have the same *offer* price resulting in no differences in the cost to the *IESO-administered market* of utilising any of the *offers*, the schedules for these *offers* shall be determined utilising the daily dispatch order determined in accordance with section 2.8.4.

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.