Market Rule Amendment Proposal

PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00381			
Subject:	Renewable Integration Initiative			
Title:	Dispatching Variable Generation			
Nature of Proposal:	☒ Alteration	☒ Deletion	☒ Addition	
Chapter:	7, 11	Appendix:	7.5	
Sections:	Chapter 7, sections 3.4.1.1.1(new), 3.4.1.4, 3.4.1.4B, Appendix 7.5, section 4.3.2.9, Chapter 11 definitions			
Sub-sections proposed for amending:				

PART 2 – PROPOSAL HISTORY

Version	Reason for Issuing	Version Date
1.0	Draft for Technical Panel review	July 10, 2012
2.0	Publish for Stakeholder Review and Comment	July 19, 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

Approved Amendment Publication Date:	
Approved Amendment Effective Date:	

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

The IESO proposes to amend the market rules in order to incorporate the dispatch of all variable generators that are registered market participants on a five-minute, economic basis, and to integrate centralized forecasts into the dispatch process.

This amendment will:

- Integrate centralized forecasting as a limit in the dispatch scheduling and pricing process on offers submitted by variable generators once dispatchable;
- Exclude variable generators from the definition of intermittent generators upon the implementation of five-minute dispatch for variable generators.

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). The amendments are based on SE-91 Renewable Integration Final Design Principle 7[1].

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

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

Background

The rapid influx of renewables in Ontario will fundamentally change the characteristics of the power system, challenging the IESO's ability to maintain reliable and cost-efficient operations. As part of the renewable integration design, the IESO will actively dispatch all variable generation[2] 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.

Discussion

Integrating Centralized Forecasts in the Dispatch Algorithm

Upon the implementation of five-minute dispatch for variable generators, the following changes are

[1] **Principle 7:** All variable resources connected to the IESO-Controlled Grid, and embedded variable resources that are registered market participants, will be actively dispatched on a five-minute economic basis.

[2] 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.*

PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

proposed in order to incorporate the centralized forecasts for variable generators that are registered market participants in the market clearing and pricing process:

- Chapter 7, section 3.4.1.1.1 (new): Obligate variable generators that are registered market participants (and a subset of dispatchable generation facilities) to submit as the quantity component of their offer the generation facility's full capacity available for production (i.e. installed capacity less outages which will be specified in the applicable market manual). Once dispatchable on a five-minute basis, proposed section 3.4.1.4B which is part of MR-00381-R00 Centralized Forecasting Integration (which received IESO Board approval on Sept 7th, 2012 with an effective date of Oct 1st, 2012) will no longer be required and will be deleted.
- Appendix 7.5, section 4.3.2.9: Add forecasts of energy for variable generators that are registered market participants, produced by the forecasting entity. From an IESO systems perspective, the centralized forecast will be considered as a limit to be applied on offers submitted in the dispatch scheduling and pricing process.

Definition of Intermittent Generator

Upon the implementation of five-minute dispatch for variable generators (that are registered market participants) the following changes are proposed to the definition of "intermittent generator" in Chapter 11:

- Exclude variable generators. This will simplify the market rules and eliminate any ambiguity as to whether a variable generator is also an intermittent generator upon the implementation of five-minute dispatch. This change will also clarify that variable generators that are registered market participants who will be subject to five-minute dispatch are separate and distinct from intermittent generators who will not be subject to five-minute dispatch (as is the case today). As a consequence of this change, the existing text in section 3.4.1.4 of Chapter 7 "for an intermittent generator that is a variable generator…" will be deleted.
- Add "unless limited by dispatch" to clarify that intermittent generators today who are not dispatched on a five-minute basis, could respond and operate according to an IESO dispatch instruction sent for reliability related reasons when fuel sources, safety, legal and regulatory restrictions allow the generator to do so.

PART 4 – PROPOSED AMENDMENT

Chapter 7

3.4 The Form of Dispatch Data

3.4.1 *Dispatch data* shall relate to a specified *dispatch hour* of the *dispatch day* and to a specified *registered facility*, shall comply with the applicable provisions of this section and sections 3.5 to 3.9 and shall take one of the following forms:

3.4.1.1 for a *dispatchable generation facility*, an *offer* to provide a *physical service* to the appropriate *real-time market*. *Offers* accepted result in

sales in the *real-time market* only to the extent that, for the *registered market participant* submitting such *offers*, the total value of the *physical services* provided to the *real-time markets* is greater than the total value of the *physical bilateral contract quantities* notified to the *IESO* in respect of that *registered market participant* pursuant to Chapter 8;

3.4.1.1.1 for a *dispatchable generation facility* that is classified as *variable generation*, an offer to provide a *physical service* to the appropriate *real-time market* reflecting its *generation facility's* full capacity available for production, determined in accordance with the applicable *market manual.*

3.4.1.2 for a *dispatchable load facility*, a *bid* to take *energy* from the *energy market*. *Bids* accepted result in purchases in the *real-time market* only to the extent that, for the *registered market participant* submitting such *bids*, the total value of the *physical services* taken from the *real-time markets* is greater than the total value of *physical bilateral contract quantities* notified to the *IESO* in respect of that *registered market participant* pursuant to Chapter 8;

3.4.1.2A [Intentionally left blank – section deleted]

3.4.1.3 for a *self-scheduling generation facility*, a *self-schedule* for the provision of *energy* to the *energy* market. *Energy* actually provided by a *self-scheduling generation facility* results in sales in the *real-time market* only to the extent that, for the *registered market participant* designated for that *self-scheduling generation facility*, the total value of *energy* provided to the *real-time market* is greater than the total value of *physical bilateral contract* quantities notified to the *IESO* in respect of that *registered market participant* pursuant to Chapter 8;

3.4.1.4 for an *intermittent generator*, a forecast of *energy* expected to be provided to the *energy market*. *Energy* actually provided by an *intermittent generator* results in sales in the *real-time market* only to the extent that, for the *registered market participant* designated for such *intermittent generator*, the total value of *energy* provided to the *real-time market* is greater than the total value of *physical bilateral contract quantities* notified to the *IESO* by that *registered market participant* pursuant to Chapter 8.; ~~For an *intermittent generator* that is a *variable generator*, this section shall cease to have effect on a date to be determined by the *IESO* with such date to be *published* by the *IESO*;~~

3.4.1.4A for a *transitional scheduling generator*, a forecast schedule for the provision of *energy to the energy market*; and

~~3.4.1.4B for a *variable generator* that is a *market participant*, its *generation facility's* full capacity available for production determined in accordance with the applicable *market manual*; and~~[Intentionally left blank – section deleted]

3.4.1.5 if the capacity reserve market has been activated pursuant to section 10.1.3, for all registered facilities providing capacity reserve, an offer to provide capacity reserve.

Appendix 7.5 – The Market Clearing and Pricing Process

4.3 Fundamental Sets and Indices

4.3.2 *Offers*

4.3.2.1 An *offer* is represented by an element of the set OFFERS and is indexed by g.

4.3.2.2 An *offer* has associated with it an area and a node.

4.3.2.3 [Intentionally left blank]

4.3.2.4 [Intentionally left blank]

4.3.2.5 A subset of OFFERS called $OFFERS_{ENERGYLIMITED}$ represents the *offers* which have a daily *energy* limit in force in accordance with section 3.5.7 of this Chapter.

4.3.2.6 Each element of g of OFFERS has a set of offer blocks, $GENERATIONOFFERBLOCKS_{g.}$

4.3.2.7 $SECURITYGENERATIONGROUP_{v}$ is the group of *offers* constrained with security constraint v.

4.3.2.8 Each *energy offer* has associated with it a set of $GENERATIONRAMPUPBLOCKS_{g}$ and a set of $GENERATIONRAMPDOWNBLOCKS_{g}$. Each set may be used to specify not less than 1 and not more than 5 ramp rates associated with the *energy offer.*

4.3.2.9 The set ENERGYOFFERBOUNDS, which is indexed by g, describes the set of *energy offers* to which minimum and maximum output levels may be applied so as to represent transmission loading relief limits, *generation facility outages* as well as limits imposed by *contracted*

ancillary services contracts, and forecasts of *energy* for the *facilities* of *variable generators* that are *registered market participants* produced by the *forecasting entity*. These limits restrict both the *energy* and *operating reserve* output of a *generation facility*.

Chapter 11

1. Definitions

intermittent generator means a *generation facility* located within the *IESO control area* that generates on an intermittent basis as a result of factors beyond the control of the *generator* unless limited by *dispatch*, and excludes a *variable generator*;

PART 5 – IESO BOARD DECISION RATIONALE

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