

Operating Reserve – Enabling System Flexibility (MR-00436)

Technical Panel
January 23, 2018

Overview

- Background on Enabling System Flexibility engagement initiative
- Overview of existing market rules for operating reserve
- Proposed market rules changes
- Next steps
- Appendix: Proposed changes to Market Manuals

Background – Enabling System Flexibility

- Objective: Determine potential solutions that can enable and improve flexibility to help meet evolving system needs
- Timing of the need and stakeholder feedback led to proposing an interim solution to increase 30-minute operating reserve (OR) requirements
 - Additional resources may be scheduled and be available to respond unexpected intra-hour changes in supply and/or demand
 - Market Renewal Program expected to address long-term needs
- The interim flexibility proposal uses existing market processes to schedule/commit resources for the additional 30-minute OR requirements

Stakeholder Engagement Update

Proposed market rule and market manual impacts were discussed at the Enabling System Flexibility stakeholder engagement session on December 8th, 2017

- No current market rules prevent the IESO using OR for flexibility
- However, the proposed market rule amendments will improve the overall clarity and consistency of the market rules related to OR
- Market manual updates are required

Stakeholder Feedback

- General support with using OR to address interim flexibility needs
- Written feedback from one stakeholder:
 - General agreement with the proposed changes to market rules and manuals
 - Recommended the following with respect to market manual changes for IESO consideration:
 - (i) Indicate a minimum MW quantity that constitutes as a material change in forecast to trigger flexibility need
 - (ii) Publish an advisory notice when the Adequacy Report is updated with changes to flexibility requirement
 - IESO will consider and respond to the recommendations for the market manual changes

Market Rules: Use of OR for Flexibility

Current market rules:

- Chapter 5, Section 4.5.1
Defines uses of OR including: unanticipated increases to load, force outages, and uncertainty related to supply and demand
- Chapter 5, Section 4.5.3
Indicates minimum requirements for OR
- These provisions already allow the IESO to use OR for flexibility

Market Rules: Uses of Operating Reserve

Chapter 5, Section 4.5.1

4.5.1 *Operating reserve* is capacity that, for any given operating interval or *dispatch interval*, is in excess to that required to meet anticipated requirements for *energy* for that operating interval or dispatch interval, and is available to the *integrated power system* for *dispatch* by the IESO within a specified time period, such as 10 minutes or 30 minutes. *Operating reserves* may be provided by *generation facilities*, *dispatchable loads* and *boundary entities* to the extent that each meets the applicable requirements to be a *registered facility* in respect of each category of *operating reserves*. Neighbouring *control areas* may also provide *operating reserve* through simultaneous activation of *operating reserve* and regional reserve sharing programs. *Operating reserve* is required to:

4.5.1.1 cover or offset unanticipated increases in load during a *dispatch day* or *dispatch hour*;

4.5.1.2 replace or offset capacity lost due to the *forced outage* of generation or transmission equipment; or

4.5.1.3 cover uncertainty associated with the performance of *generation facilities* or *dispatchable loads* in responding to the IESO's *dispatch instructions*.

Market Rules: OR Minimum Requirements

Chapter 5, Section 4.5.3

4.5.3 The *IESO* shall maintain, as a minimum, total *operating reserve* that is the sum of the *ten-minute operating reserve* requirement and the *thirty-minute operating reserve* requirement.

Note: This rule sets the minimum requirements for OR.

Market Rules: Ten-Minute OR Requirements

Chapter 5, Section 4.5.8

4.5.8 The *IESO* shall maintain sufficient *ten-minute operating reserve* to meet the requirements of all applicable *reliability standards*. This shall be at least equal to the largest first contingency loss sustainable on the *IESO-controlled grid*.

Note: Northeast Power Coordinating Council (NPCC) Directory #5 conveys the same requirement: “Each Balancing Authority shall have ten-minute reserve available to it that is at least equal to its first contingency loss.”

Market Rules: Thirty-Minute OR Requirements

Chapter 5, Section 4.5.19

4.5.19 Subject to section 4.5.20, the requirement for *thirty-minute operating reserve* shall be one-half of the largest *second contingency loss* sustainable on the *IESO-controlled grid*. However, when a *generation unit* is commissioning and is one of the two largest *contingency events*, the requirement for *thirty-minute operating reserve* shall equal the *second contingency loss*.

Market Rules: Thirty-Minute OR (continued)

Chapter 5, Section 4.5.20

4.5.20 If such a commissioning *generation unit* is not one of the two largest *contingency events*, the requirement for *thirty-minute operating reserve* shall be the larger of one-half of the *second contingency loss* or the output of the commissioning *generation unit*.

Note: NPCC indicates, “Each Balancing Authority shall have thirty-minute reserve available to it that is at least equal to one-half its second contingency loss.” For 4.5.19, 4.5.20, propose to use “at least” language.

Proposed Market Rule Amendments

Rationale

- Provides clarity that the requirement for 30-minute OR is a minimum requirement
- Consistent with the market rules language related to 10-minute OR
- Consistent with Northeast Power Coordinating Council requirements for 30-minute reserve

Proposed Market Rule Amendments

Chapter 5, Section 4.5.19

Proposed changes in green

Subject to section 4.5.20, the requirement for *thirty-minute operating reserve* shall be **at least equal to** one-half of the largest *second contingency loss* sustainable on the *IESO-controlled grid*. However, when a *generation unit* is commissioning and is one of the two largest *contingency events*, the requirement for *thirty-minute operating reserve* shall **be at least equal to** the *second contingency loss*.

Proposed Market Rule Amendments

Chapter 5, Section 4.5.20

Proposed changes in green

If such as commissioning *generation unit* is not one of the two largest *contingency events*, the requirement for *thirty-minute operating reserve* shall be **at least equal to** the larger of one-half of the *second contingency loss* or the output of the commissioning *generation unit*.

Next Steps

Date	Activity
January 23 rd , 2018	Technical Panel Meeting – Review market rule amendment and seek a vote to post the proposed amendment for stakeholder comment
March 6 th , 2018	Technical Panel Meeting – Review comments from stakeholders and seek a vote to recommend the proposed amendment to the IESO Board for consideration
April 11 th , 2018	IESO Board to consider proposed rule amendment
May 4 th , 2018	Earliest effective date of the market rule amendment (22 days following publication of IESO Board approved amendment)
Q1, 2018	Next stakeholder meeting to discuss process details
Q1 – Q2, 2018	Market Manual updates
Q2, 2018	Initial trials using 30-minute OR for flexibility

Appendix: Proposed Market Manual Changes For Information Only

Proposed Market Manual Changes

To notify Market Participants of the need for flexibility, changes to two Market Manuals are proposed:

- Market Manual Part 7.1, Section 2.4.2 relates to actions taken for variable generation events
- Market Manual Part 7.2, Appendices provide information on the Adequacy report

Current Market Manual 7.1, Section 2.4.2

2.4.2 Variable Generation Events

Table 2-3 provides examples of conditions that may require the IESO to take control actions, as well as examples of the potential actions, when we anticipate or are experiencing a variable generation event.

The IESO may issue an advisory notice in advance of or during a *variable generation* event as appropriate. The alert will notify the market of:

- The type of *variable generation* event expected or in progress, and
- The action(s) the IESO is taking.

Table 2-3: IESO Actions to Manage Variable Generation Events

If...	Then...
<p>The IESO experiences, or expects conditions that may result in:</p> <ul style="list-style-type: none">• Material differences between forecasted and actual <i>variable generation</i> output, or• Significant <i>variable generation</i> ramp events.	<p>The IESO may:</p> <ul style="list-style-type: none">• Manually adjust the <i>variable generation</i> forecast to align it with expected <i>variable generation</i> output,• Commit/constrain on/ constrain off <i>dispatchable</i> resources,• Curtail export⁴ transactions mid-hour, or• Take other actions appropriate for the circumstances.

Market Manual 7.1, Section 2.4.2

Proposed changes:

- Revise references of “variable generation events” to “system flexibility events”
- Provide definition of system flexibility as, “the ability of the power system to respond to intra-hour differences between supply/demand levels and actual production/consumption”

Market Manual 7.1, Section 2.4.2

Proposed changes (continued):

- Include as a condition requiring system flexibility
 - Material differences between forecasted and actual demand
- Include as an action to manage system flexibility
 - Adjusting the 30-minute operating reserve requirement

Market Manual 7.2, Section 2.2

Publication of the adequacy report is a suitable means to indicate the need for flexibility

- By 5:30 EST for the next day
- By 9:00 EST for the next day
- After each successful run of the day-ahead commitment process for the next day
- Hourly after 15:00 EST for the next day
- Twice per hour for the current day

Proposed Adequacy Report Change



Adequacy Report

	Capacity Exports	127	127	127	127	127	127
Generation Reserve Holdback	Total Operating Reserve Requirement	1418	1418	1418	1418	1418	1418
	Minimum 10-Minute OR	945	945	945	945	945	945
	Minimum 10-Minute Spin OR	237	237	237	237	237	237
	Load Forecast Uncertainty	0	0	0	0	0	0
	Additional Contingency Allowance	0	0	0	0	0	0
Total Requirement		15543	15006	14682	14601	14786	1593

Insert new row to indicate "Flexibility Need"

