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## Market Rule Amendment Proposal

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### PART 1 – MARKET RULE INFORMATION

Identification No.:	MR-00436		
Subject:	Operating Reserve		
Title:	Enabling System Flexibility: Thirty-Minute Operating Reserve		
Nature of Proposal:	<input checked="" type="checkbox"/> Alteration	<input type="checkbox"/> Deletion	<input type="checkbox"/> Addition
Chapter:	5	Appendix:	
Sections:	4.5		
Sub-sections proposed for amending:	4.5.19, 4.5.20		

### PART 2 – PROPOSAL HISTORY

Version	Reason for Issuing	Version Date
1.0	Draft for Technical Panel Review	January 16, 2018
2.0	Publish for Stakeholder Review and Comment	January 25, 2018
3.0	Submitted for Technical Panel Vote	February 27, 2018
4.0	Recommended by Technical Panel; Submitted for IESO Board Approval	March 6, 2018
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 amendments to the market rules to provide clarification and ensure consistency in the market rules related to operating reserve requirements. These amendments were identified through the [Enabling System Flexibility](#) engagement initiative which proposes to utilize 30-minute operating reserve to schedule additional resources that can be available to improve response during a significant unexpected intra-hour change in supply and demand. The initiative proposes using existing market processes to schedule and commit resources for the additional thirty-minute operating reserve.

Although no current market rules prevent the IESO's use of operating reserve for flexibility, the proposed amendments are intended to provide clarification that the requirement for thirty-minute operating reserve is a minimum requirement. The amendments will ensure consistency with the market rules language related to ten-minute operating reserve, as well as consistency with operating reserve requirements specified in the [NPCC](#) Regional Reliability Reference Directory #5.

#### Background

##### Operating Reserve

Operating Reserve (OR) is stand-by power or demand reduction that the IESO can call on with short notice to manage an unexpected mismatch between generation and consumption. OR may be activated by the IESO in response to:

- A sudden unexpected change in demand;
- A generation loss or the loss of transmission resulting in a more restrictive operating limit that reduces or completely removes access to available supply; or
- Uncertainty associated with generators unable to follow their dispatch instructions.

The IESO administers three separate OR markets in addition to the energy market. The three classes of OR are defined by the time required to bring the energy into use: ten-minute spinning OR (10S), ten-minute non-spinning OR (10N) and thirty-minute OR (30R). Reliability standards set the amount of OR the IESO must schedule and the associated performance requirements. These include the Northeast Power Coordinating Council, Inc. (NPCC) Regional Reliability Reference Directory #5 and the North American Reliability Corporation (NERC) Standard BAL-002. Ten-minute OR must be at least equal to the largest contingency, typically 945 MW, and at least 25% must be 10S OR. Thirty-minute OR must equal one-half of the second largest contingency, typically 473 MW. The market rules provide that these are minimum obligations for OR. Thirty-minute OR may be further increased to reflect the active commissioning of large resources.

##### Flexibility

Ontario needs more flexible capability to match the needs of Ontario's evolving supply mix. Flexibility is the capability of the system to respond to unexpected intra-hour differences between expected supply/demand levels and actual production/consumption. Flexibility need is influenced by forecast uncertainty of variable generation and demand. For example, large over-forecasts of variable

### PART 3 – EXPLANATION FOR PROPOSED AMENDMENT

generation and under-forecasts of demand within the hour of dispatch are a concern. Forecasts improve significantly in the 30-minute ahead of dispatch timeframe. As such, resources that are already on-line or able to start-up and synchronize within 30-minutes can provide flexibility. Current measures to increase flexibility include manually committing resources in advance of anticipated need, adjusting variable generation and demand forecasts, or curtailing exports.

#### Interim Solution

The IESO initiated the Enabling System Flexibility stakeholder engagement in 2016 with the objective of determining potential solutions that can enable and achieve flexibility to meet evolving system needs. Timing of the flexibility need and stakeholder feedback led to the proposal of an interim solution to enable existing resources to provide required flexibility by increasing the requirements for operating reserve. An enduring solution will be determined through future market enhancements.

Since resources that are online or able to start-up and synchronize within 30-minutes can provide flexibility, the proposed interim solution intends to use thirty-minute OR to schedule additional resources that can be available to supply operating reserve or energy to respond to intra-hour flexibility needs. Although the need for flexibility becomes more certain as forecasts improve in the timeframe approaching real-time dispatch, the risk of need can be anticipated many hours ahead of real-time dispatch. Using additional thirty-minute OR to signal the flexibility need increases transparency and allows resources time to adjust bids/offers to provide flexibility. Existing pre-dispatch and day-ahead commitment processes will be used to economically schedule resources to meet additional thirty-minute OR requirements for flexibility. As such, the proposal leverages current market processes and existing resources for flexibility. Resource commitments may occur and additional thirty-minute OR scheduled can also be activated for flexibility if required.

#### **Discussion**

##### Chapter 5

The existing market rules allow the IESO to increase OR for flexibility. Section 4.5.1 of Chapter 5 defines uses of OR, which includes using OR for uncertainty related to supply and demand. Section 4.5.3 of Chapter 5 enables an increase in total OR above the minimum obligations reflected in the specific provisions of Chapter 5 related to ten-minute and thirty-minute OR. The proposed market rule amendments are intended to provide clarification and ensure consistency in the market rules related to OR:

- Amend **section 4.5.19** and **section 4.5.20** to add “at least,” in order to provide clarification that the requirement for thirty-minute OR is a minimum requirement. This amendment ensures consistency with the ten-minute OR language in section 4.5.8 of Chapter 5. Furthermore, the “at least equal to” is consistent with language in the NPCC Regional Reliability Reference Directory #5 which specifies in section 5.3 that “Each Balancing Authority shall have thirty-minute reserve available to it that is at least equal to one-half its second contingency loss. Thirty-minute reserve shall be sustainable as specified in section 5.13.”

### PART 4 – PROPOSED AMENDMENT

## Chapter 5

**4.5 Operating Reserve**

- 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*.
- 4.5.2 The *IESO* shall maintain sufficient *operating reserve* to meet all applicable *reliability standards*.
- 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.
- 4.5.4 Part of the requirement for *ten-minute operating reserve* shall be synchronized with the *IESO-controlled grid* consistent with section 4.5.9.
- 4.5.5 The *IESO* shall ensure that *operating reserve* is distributed throughout the *IESO-controlled grid* such that sufficient *operating reserve* can be activated and delivered to any location on the *integrated power system*.

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**Ten-Minute Operating Reserve**

- 4.5.7 *Ten-minute operating reserve* is capacity that is available to the *integrated power system* in excess of anticipated requirements for *energy* and that can be made available and used within ten minutes. It includes resources that are either synchronized or non-synchronized with the *IESO-controlled grid*.
- 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*.

- 4.5.9 *Ten-minute operating reserve* shall be synchronized with the *IESO-controlled grid* to the extent required by all applicable *reliability standards*.
- 4.5.10 If, for any reason, there is a deficiency of *ten-minute operating reserve*, the *IESO* shall replace such *reserve* in accordance with the applicable *reliability standards* referenced in the *market manuals*.
- 4.5.11 The *IESO* shall, in accordance with Chapter 7, *publish* daily its estimates of the quantity of *ten-minute operating reserve* that is required for each hour of the following day.
- 4.5.12 A registered facility that is a boundary entity that is used as ten-minute operating reserve shall be treated as operating reserve that is non-synchronized with the *IESO-controlled grid*.
- 4.5.13 The reduction in load that can be effected by curtailing pumping hydroelectric *generation facilities* is eligible to be treated as *operating reserve* that is synchronized with the *IESO-controlled grid*.

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### Thirty-Minute Operating Reserve

- 4.5.18 *Thirty-minute operating reserve* is capacity in excess of anticipated requirements for *energy* that can be made available and used within thirty-minutes and that is not included as *ten-minute operating reserve*.
- 4.5.19 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*.
- 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 [at least equal to](#) the larger of one-half of the *second contingency loss* or the output of the commissioning *generation unit*.
- 4.5.21 The requirement for *thirty-minute operating reserve* shall be maintained in accordance with the applicable *reliability standards* referenced in the *market manuals*.

### PART 5 – IESO BOARD DECISION RATIONALE

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