Market Rule Amendment Proposal Form

Part 1 - Market Rule Information

Identification No.:	MR-00467-R00
Subject:	Improving Accessibility of Operating Reserve
Title:	Improving Accessibility of Operating Reserve
Nature of Proposal:	☒ Alteration ☐ Deletion ☒ Addition
Chapter:	7 & 9
Appendix:	N/A
Sections:	Chapter 7, Sections 7.4 & 7.5 Chapter 9, Sections 3.4 & 3.9
Sub-sections proposed for amending:	Chapter 7, Sub-sections 7.4.2.1, 7.4.3, 7.4.6 & 7.5.9 Chapter 9, Sub-sections 3.4.2, 3.4.2.1, 3.4.3, 3.4.3.1, 3.4.3.2, 3.4.3.3 & 3.9.1
Current Market Rules Baseline:	Baseline 45.1 - June 2, 2021

Part 2 - Proposal History

Version	Reason for Issuing	Version Date
1.0	Issued for Technical Panel review	July 20, 2021
2.0	Issued for Technical Panel review	May 31, 2022

Approved Amendment Publication Date:

Approved Amendment Effective Date:

Part 3 - Explanation for Proposed Amendment

Provide a brief description that includes some or all of the following points:

- 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 is proposing to amend the market rules to add a settlement charge in order to more efficiently claw back operating reserve (OR) payments from market participants where the market participant fails to maintain adequate unused generation (or load reduction) capacity during all intervals in which they were scheduled for OR.

Background

Operating Reserve is stand-by power or demand reduction that the IESO can call on with short notice to deal with an unexpected mismatch between electricity generation and consumption. The IESO schedules OR for every minute of every day to meet requirements set by the North American Electric Reliability Corporation (NERC) and the Northeast Power Coordinating Council (NPCC) to ensure power system reliability. The IESO has been experiencing an issue with OR where the amount of scheduled OR is not fully accessible - meaning, there is a difference between the amount of OR the IESO schedules and the actual amount of OR that is received when it is activated (dispatched). This issue could create challenges for the IESO to recover the supply-demand balance after a system event, and result in unfair cost to the market.

The Market Surveillance Panel (MSP), in its May 2017 report, made the following recommendation:

> The IESO should take steps to ensure that dispatchable loads are only compensated for the amount of operating reserve they were capable of providing in real-time. More fundamentally, the IESO should explore options for ensuring unavailable OR is not scheduled in the first instance.

During the IESO's examination of the issue, it was identified that the OR accessibility issue is not limited to DLs; it applies to all dispatchable resources. The amount of energy provided following an OR activation (ORA) is affected by the actual production/consumption of the resource preceding the ORA. Deviations from the dispatch instruction preceding the activation result in differences between the amount of OR scheduled and the energy or demand reduction that is actually provided when OR is activated.

In light of this, the IESO established a stakeholder forum to review and improve accessibility of operating reserve. At the March 2022 stakeholder engagement meeting, the IESO presented a revised proposal to remove the proposed addition of section 7.4.3A of Chapter 7. This reduction in scope means that there will be no change to the current practice of how the IESO determines OR activation dispatch targets for applicable market participants. Information on the improving accessibility of operating reserve stakeholder engagement including presentations and stakeholder feedback is available on the engagement website.

Discussion

Chapter 7

Section 7.4.2 states that a facility that is scheduled to provide operating reserve must maintain unused generation or load reduction capacity equal to or greater than their scheduled operating reserve. Currently where a facility fails to do so, the IESO would carry out a compliance recovery investigation to recover compensation from a specific registered facility that operated in a way that did not provide the service for which it has been paid pursuant to Chapter 9, section 3.8.1. In order to streamline this process the IESO is proposing sub-section 7.4.2.1 to apply a non-accessibility charge in order to make the recovery of this compensation an automated process included in the regular settlement process.

Section 7.4.3 is proposed to be amended to have a clerical correction made to it to correctly add "or reducing energy withdrawal" as would be applicable when a load facility is dispatched to reduce energy withdrawal during an ORA.

Section 7.4.6 is proposed to be added to the market rules so that when a facility is sent a dispatch, the IESO has the right to recover any inappropriate congestion management settlement credit in accordance with section 3.5.2 of Chapter 9.

Section 7.5.9 is proposed to be amended to have a clerical correction made to it to correctly add "or reducing energy withdrawal" as would be applicable when a load facility is dispatched to reduce energy withdrawal during an ORA.

Chapter 9

Section 3.4.2 is proposed to be added to describe the settlement formula for the non-accessibility charge specified in section 7.4.2.1 of Chapter 7

Section 3.9.1 is proposed to be amended to add the non-accessibility charge to the hourly uplift settlement amounts in order for the recovered funds to be redistribution to the market.

Part 4 - Proposed Amendment

Chapter 7 - System Operations and Physical Markets

7.4 IESO Dispatch of Operating Reserve

7.4.2 Each *registered facility* to which section 7.4.1 applies shall maintain unused *generation* (or load reduction) *capacity* during that *dispatch interval*, consistent with the *dispatch instructions* issued to it under these *market rules*, so as to be able to increase *energy* production (or decrease *energy* withdrawal) as soon as possible upon being instructed to do so by the *IESO* pursuant to section 7.4.3.

7.4.2.1 A *market participant* shall be subject to non-accessibility charges if it fails to maintain unused *generation* (or load reduction) *capacity* equal to or greater than its total amount of scheduled *operating reserve* during any *interval* in which it is scheduled to provide *operating reserve* but is not *dispatched* to increase *energy generation* (or load reduction) pursuant to

section 7.4.3. The *market participant* may also be subject to compliance actions in accordance with section 6 of Chapter 3.

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7.4.3 Where a *contingency event* has occurred or is occurring, the *IESO* may issue *dispatch instructions* within the *dispatch interval*, instructing a *registered facility*, other than a *boundary entity*, providing *operating reserve* to begin increasing *energy* production or reducing *energy* withdrawal as specified in its *offers* of *operating reserve*. *Dispatch instructions* issued in respect of a *registered facility* that is a *boundary entity* providing *operating reserve* shall be such as to ensure that the *energy* associated with each *offer* of *operating reserve* is scheduled by the *IESO* in a manner consistent with all relevant *reliability standards* for activation of *operating reserve* and as agreed upon by the entity scheduling the resulting *energy* transfer.

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7.4.6 A *registered facility* that failed to maintain unused *generation* (or load reduction) *capacity* equal to or greater than their total amount of scheduled *operating reserve* is not entitled to any inappropriate congestion management *settlement* credit determined in accordance with section 3.5.2 of Chapter 9. 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.

7.5 Compliance with Dispatch Instructions

7.5.9 In addition to any other sanction or consequence provided for in these *market rules*, the *IESO* may disqualify from future participation in the *operating reserve market* any *registered facility* that consistently fails to produce *energy* or reducing *energy* withdrawal when called upon in accordance with Chapter 7.

Chapter 9 – Settlements and Billing

3.4 Hourly Settlement Amounts for Operating Reserve and Charges

3.4.2 The *IESO* shall apply the non-accessibility charge specified in section 7.4.2.1 of Chapter 7, and a *market participant* shall be subject to such non-accessibility charge, for every *dispatch interval* where the *market participant* is scheduled to provide *operating reserve* but was not dispatched to increase *energy generation* (reduce load) pursuant to section 7.4.3 Chapter 7, and where the total scheduled *operating reserve* is greater than the total accessible *operating reserve* as determined by:

$$\sum_R AQOR_{rn,k,h}^{m,t} > TAOR_{k,h}^{m,t} \text{ and } \sum_R AQOR_{rn,k,h}^{m,t} > 0$$

Where:

R: is the set of all classes of *operating reserve*

For *operating reserve* provided by a *dispatchable load*:

$$TAOR_{k,h}^{m,t} = Max\left(0, AQEW_{k,h}^{m,t} - MC_m^{h,t}\right)$$

$MC_m^{h,t}$ = minimum consumption level and is equal to the quantity in the *price-quantity pair* where the *bid* price is *MMCP*

For *operating reserve* provided by a *generator* other than aggregated *facilities*:

$$TAOR_{k,h}^{m,t} = Max\left(0, MAX\_CAP_{k,h}^{m,t} - AQEI_{k,h}^{m,t}\right)$$

$MAX\_CAP_{k,h}^{m,t}$ = the maximum limit used in determining the *real-time schedule* in the *dispatch scheduling* and pricing process as described in Chapter 7, Appendix 7.5 for each *interval*

3.4.2.1 Where *operating reserve* is scheduled to be provided by aggregated *facilities,* a *market participant* shall be subject to a non-accessibility charge for every *dispatch interval* where the *market participant* is scheduled to provide *operating reserve* but was not dispatched to increase *energy generation* pursuant to section 7.4.3 of Chapter 7, and where the total scheduled *operating reserve* is greater than the total accessible *operating reserve* as determined by:

$$\sum_R^M AQOR_{rn,k,h}^{m,t} > TAOR\_CA_{k,h}^{M,t}, \text{ and } \sum_R^M AQOR_{rn,k,h}^{m,t} > 0$$

Where:

R: is the set of all classes of *operating reserve*

M: is set of all *delivery points* 'm' that are compliance aggregated

Total accessible *operating reserve* (TAOR) for aggregated *generators:*

$$TAOR\_CA_{k,h}^{M,t} = Max\left(0, \sum^{M}\left(MAX\_CAP_{k,h}^{m,t} - AQEI_{k,h}^{m,t}\right)\right)$$

$MAX\_CAP_{k,h}^{m,t}$: the maximum limit used in determining the *real-time schedule* in the *dispatch scheduling* and pricing process as described in Chapter 7, Appendix 7.5 for each *interval*

3.4.3 Where it is determined that a non-accessibility charge is to be applied to a *market participant* pursuant to section 3.4.2, the non-accessibility charge shall be calculated for each class of *operating reserve* as follows:

For synchronized *ten-minute operating reserve*:

$$ORSCB_{r1,k,h}^{m,t} = Min\left(0, \left(TAOR_{k,h}^{m,t} - AQOR_{r1,k,h}^{m,t}\right) \times PROR_{r1,h}^{m,t}\right)$$

For non-synchronized *ten-minute operating reserve*:

$$ORSCB_{r2,k,h}^{m,t} = Min\left(0, \left(Max\left(0, TAOR_{k,h}^{m,t} - AQOR_{r1,k,h}^{m,t}\right) - AQOR_{r2,k,h}^{m,t}\right) \times PROR_{r2,h}^{m,t}\right)$$

For *thirty-minute operating reserve*:

$$ORSCB_{r3,k,h}^{m,t} = Min\left(0, \left(Max\left(0, TAOR_{k,h}^{m,t} - AQOR_{r1,k,h}^{m,t} - AQOR_{r2,k,h}^{m,t}\right) - AQOR_{r3,k,h}^{m,t}\right) \times PROR_{r3,h}^{m,t}\right)$$

Where:

$AQOR_{rn,k,h}^{m,t}$: Allocated quantity in MW of *class r reserve* for *market participant* 'k' at *RWM* 'm' in *metering interval* 't' of *settlement hour* 'h';

$PROR_{rn,h}^{m,t}$*: Market price* in $/MW of *class r reserve* in *metering interval* 't' of *settlement hour* 'h' at *RWM* 'm';

r1 denotes the *ten-minute operating reserve* that is synchronized with the *IESO-controlled grid*;

r2 denotes *ten-minute operating reserve* that is not synchronized with the *IESO-controlled grid*; and

r3 denotes *thirty-minute operating reserve*.

3.4.3.1 Where it is determined that a non-accessibility charge is to be applied to a *market participant* pursuant to section 3.4.2.1, the amount of non-accessible *operating reserve* shall be determined for each class of *operating reserve* as follows:

For aggregated *generators* scheduled to provide synchronized *ten-minute operating reserve*:

$$ORIA\_CA_{r1,k,h}^{M,t} = Min\left(0, TAOR\_CA_{k,h}^{M,t} - \sum^{M} AQOR_{r1,k,h}^{m,t}\right)$$

For aggregated *generators* scheduled to provide non-synchronized *ten-minute operating reserve*:

$$ORIA\_CA_{r2,k,h}^{M,t} = Min\left(0, Max\left(0, TAOR\_CA_{k,h}^{M,t} - \sum^{M} AQOR_{r1,k,h}^{m,t}\right) - \sum^{M} AQOR_{r2,k,h}^{m,t}\right)$$

For aggregated *generators* scheduled to provide *thirty-minute operating reserve*:

$$ORIA\_CA_{r3,k,h}^{M,t} = Min\left(0, Max\left(0, TAOR\_CA_{k,h}^{M,t} - \sum^{M} AQOR_{r1,k,h}^{m,t} - \sum^{M} AQOR_{r2,k,h}^{m,t}\right) - \sum^{M} AQOR_{r3,k,h}^{m,t}\right)$$

Where:

$AQOR_{rn,k,h}^{m,t}$: Allocated quantity in MW of *class r reserve* for *market participant* 'k' at *RWM* 'm' in *metering interval* 't' of *settlement hour* 'h';

r1 denotes the *ten-minute operating reserve* that is synchronized with the *IESO-controlled grid*;

r2 denotes *ten-minute operating reserve* that is not synchronized with the *IESO-controlled grid*; and

r3 denotes *thirty-minute operating reserve*.

3.4.3.2 The non-accessibility charge calculated pursuant to section 3.4.2.1 will be divided among individual aggregate *facilities* on a pro-rated based on the percentage of total inaccessible *operating reserve* attributed to it as determined as follows:

$$ORCF_{rn,k,h}^{m,t} = \frac{ORIA_{rn,k,h}^{m,t}}{\sum^{M1} ORIA_{rn,k,h}^{m,t}}$$

M1: is the set of delivery point 'm' where a resource has operating reserve scheduled for OR class 'rn'.

Total inaccessible *operating reserve* for *generators:*

For synchronized *ten-minute operating reserve*:

$$ORIA_{r1,k,h}^{m,t} = Min\left(0, \left(TAOR_{k,h}^{m,t} - AQOR_{r1,k,h}^{m,t}\right)\right)$$

For non-synchronized *ten-minute operating reserve*:

$$ORIA_{r2,k,h}^{m,t} = Min\left(0, \left(Max\left(0, TAOR_{k,h}^{m,t} - AQOR_{r1,k,h}^{m,t}\right) - AQOR_{r2,k,h}^{m,t}\right)\right)$$

For *thirty-minute operating reserve*:

$$ORIA_{r3,k,h}^{m,t} = Min\left(0, \left(Max\left(0, TAOR_{k,h}^{m,t} - AQOR_{r1,k,h}^{m,t} - AQOR_{r2,k,h}^{m,t}\right) - AQOR_{r3,k,h}^{m,t}\right)\right)$$

Where:

Total accessible *operating reserve* for *generators*:

$$TAOR_{k,h}^{m,t} = Max\left(0, MAX\_CAP_{k,h}^{m,t} - AQEI_{k,h}^{m,t}\right)$$

3.4.3.3 The non-accessibility charge calculated pursuant to section 3.4.3.2 will be calculated for an individual aggregate *facility* as follows:

$$ORSCB_{rn,k,h}^{m,t} = ORIA\_CA_{rn,k,h}^{M,t} \times ORCF_{rn,k,h}^{m,t} \times PROR_{rn,h}^{m,t}$$

Where:

$PROR_{rn,h}^{m,t}$*: Market price* in $/MW of *class r reserve* in *metering interval* 't' of *settlement hour* 'h' at *RWM* 'm'.

3.9 Hourly Uplift Settlement Amounts

3.9.1 The hourly *settlement amounts* defined by the preceding provisions of this section 3 will result in an hourly *settlement* deficit that shall be recovered from *market participants* as a whole through the *hourly uplift*.

The total *hourly uplift settlement amount* for *settlement hour* 'h' ("$HUSA_h$") shall be determined according to the following equation:

$$HUSA_h = \sum_K \left(NEMSC_{k,h} + ORSC_{k,h} + CMSC_{k,h} + RDSA_{k,h} + TRSC_{k,h} + IOG_{k,h}\right) + TCRF_{k,h} - \sum_K \left(\sum_R ORSSD_{k,r,h} + \sum_R ORSCB_{r,k,h} + DA\_IFC_{k,h} + RT\_IFC_{k,h} + DA\_EFC_{k,h} + RT\_EFC_{k,h} + DA\_LWFC_{k,h}\right)$$

over all 'k' *market participants*

$NEMSC_{k,h}$ = net *energy market settlement* credit for *market participant* 'k' in *settlement hour* 'h'

$ORSC_{k,h}$ = *operating reserve market settlement* credit for *market participant* 'k' in *settlement hour* 'h'

$CMSC_{k,h}$ = congestion management *settlement* credit for *market participant* 'k' in *settlement hour* 'h'

$RDSA_{k,h}$ = ramp-down *settlement* amount for *market participant* 'k' in *settlement hour* 'h'

$TRSC_{k,h}$ = *transmission rights settlement* credit for *market participant* 'k' in *settlement hour* 'h'

$IOG_{k,h}$ = intertie offer guarantee settlement credit for the *market participant* 'k' in *settlement hour* 'h'

$DA\_IFC_{k,h}$= day-ahead import failure charge for the *market participant* 'k' in *settlement hour* 'h'

$RT\_IFC_{k,h}$ = real-time import failure charge for the *market participant* 'k' in *settlement hour* 'h'

$DA\_EFC_{k,h}$= day-ahead export failure charge for the *market participant* 'k' in *settlement hour* 'h'

$RT\_EFC_{k,h}$= real-time export failure charge for the *market participant* 'k' in *settlement hour* 'h'

$DA\_LWFC_{k,h}$= day-ahead linked wheel failure charge for the *market participant* 'k' in *settlement hour* 'h'

TCRFh = transmission charge reduction fund contribution in *settlement hour* 'h'

$ORSSD_{k,r,h}$ = *operating reserve settlement* debit for *operating deviations* for *class r reserve* for *market participant* 'k' in *settlement hour* 'h'

$ORSCB_{r,k,h}$ = *operating reserve* non-accessibility charge for *class r reserve* for *market participant* 'k' in *settlement hour* 'h'