# Market Rule Amendment Proposal

## PART 1 – MARKET RULE INFORMATION

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| Identification No.: | **MR-00296-R00** | | | |
| Subject: | **Market Pricing** | | | |
| Title: | **Emergency Control Actions and Counter-Intuitive Prices – Inputs to Dispatch Scheduling and Pricing Process** | | | |
| Nature of Proposal: | ☒ Alteration | ☐ Deletion | ☐ Addition | |
| Chapter: | 7 | Appendix: | 7.5 | |
| Sections: | 3.2 | | | |
| Sub-sections proposed for amending: | 3.2.1, 3.2.1.12 (new) | | | |

## PART 2 – PROPOSAL HISTORY – PLEASE REFER TO MR-00296-R00

| Version | Reason for Issuing | Version Date |
|---|---|---|
| 1.0 | Submitted for Technical Panel Review | 2 June 2005 |
| 2.0 | Publish for Stakeholder Review and Comment | 8 June 2005 |
| 3.0 | Recommended by Technical Panel; Submitted for IESO Board Approval | 14 June 2005 |
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| 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**

It is proposed to amend the market rules to address counter-intuitive market pricing that can occur when the IESO implements emergency control actions to maintain reliability of the IESO-controlled grid. These emergency control actions include voltage reductions, emergency energy purchases, and non-dispatchable load cuts. The counter-intuitive pricing occurs when the emergency control action affects demand in the market pricing sequences, resulting in pricing outcomes and signals that do not reflect actual market conditions.

The specific proposed amendments are:

- Enable the IESO to increase or decrease market demand in the market schedule to offset the effect that an emergency control actions has on market demand. This proposed amendment is intentionally "enabling" rather than specific to accommodate potentially different implementation requirements for different emergency control actions (refer to MR-00296-R00);
- Specify that emergency energy purchases not be represented as a change in non-dispatchable load in the market schedule (refer to MR-00296-R00); and
- Permit the IESO to administer prices after-the-fact when emergency control actions result in counter-intuitive pricing (refer to MR-00296-R01).

These amendments represent an initial but flexible step in addressing counter-intuitive pricing situations in the IESO-administered markets. This proposed solution does not completely address the stated need by market participants for real-time price signals that are more representative of market and system conditions when the IESO undertakes emergency control actions. However, it is a solution that can be implemented quickly and which may reduce or eliminate some counter-intuitive pricing that can occur and will be available for use by the IESO in the summer of 2005. It is proposed to address the impact of emergency energy purchases on market demand in the market schedule because the IESO uses this emergency control action more often than others.

**Background**

On April 7, 2005, conditions arose that necessitated the IESO to implement, as per approved procedures, a number of emergency control actions to maintain the reliable operation of the IESO-controlled grid. These emergency control actions included both voltage reductions and the purchase of emergency energy from neighbouring jurisdictions. As a consequence of these actions and their representation in the uniform market clearing price calculations, the wholesale market clearing price fell. The resulting prices were counter-intuitive to the stressed conditions being experienced on the system.

Since market commencement, excluding the August 2003 blackout and corresponding recovery:

**PART 3 – EXPLANATION FOR PROPOSED AMENDMENT**

- the IESO has purchased emergency energy on 22 occasions including April 7, 2005; and
- the IESO has initiated voltage reductions twice including April 7, 2005.

Under the current market rules and treatment, voltage reductions and emergency energy purchases result in a reduction in demand in the IESO-administered markets. A voltage reduction, by its very nature, reduces demand. Emergency energy purchases are input by the IESO as a reduction in demand in the constrained sequences so that the dispatch scheduling algorithm can dispatch other supply resources to meet the balance of the demand. The demand reduction in the constrained sequence is carried through to the unconstrained market pricing sequences. These demand reductions, whether resulting from a voltage reduction or an emergency energy purchase, have the effect of also lowering market prices.

The IESO initiates emergency control actions at times of system stress, which are typically times of tight supply-demand balance and high market prices. Intuitively, one would expect such circumstances to result in high market prices. Such prices send an appropriate and necessary signal to the market for suppliers to come to market and for load to reduce demand and as such these appropriate price responses would assist the IESO in maintaining the reliable operation of the IESO-controlled grid. The reductions in the uniform market clearing price resulting from an emergency energy purchase or voltage reduction sends a counter-intuitive price signal to the market at these times of system stress. This counter-intuitive price signal has the ultimate effect of undermining both the efficiency of the market and the confidence that market participants have in the market.

Changes in the IESO administered markets have been made by the IESO since market opening to reduce the frequency of such conditions. These changes include the introduction of control action operating reserve in the market and the creation of the spare generation on-line program. In addition supply within Ontario has increased. These measures serve to reduce the chance that emergency control actions will be required to maintain the reliable operation of the IESO-controlled grid. However, these measures do not eliminate the underlying aspects of market price determination that lead to counter-intuitive price outcomes. Emergency control actions may be needed at anytime and thus there is a priority need to address the counter-intuitive pricing that can be created by the use of these actions.

It should be noted, however, that actual demand response to high prices can occur at times of system stress and that this response will naturally result in reduced demand and lower prices. In these instances it is market forces that are causing reduced demand and lower prices, not IESO actions.

**Discussion**

When the IESO undertakes certain emergency control actions that affect demand in the market schedule, the resulting energy market prices may not accurately reflect the prevailing market and system conditions.

For emergency energy purchases the counter-intuitive pricing occurs because the IESO reduces demand in constrained sequences by an amount equivalent to the emergency energy purchase and the dispatch scheduling algorithm automatically carries that demand reduction to market schedules. The effect of the IESO purchasing emergency energy is a decline in market prices. This decline is counter-intuitive given that emergency energy purchases are necessary to maintain reliability.

For other emergency control actions which the IESO has undertaken, such as voltage reductions or load cuts, electrical demand is actually reduced in Ontario thus resulting in a decline in energy market prices. A decline in energy market prices at the same time in which the IESO is undertaking these

**PART 3 – EXPLANATION FOR PROPOSED AMENDMENT**

emergency control actions is again counter-intuitive.

It is proposed to mitigate the effect of the emergency control action on demand in the market schedule and the resulting impact on market prices by the following rule changes:

- First, amend section 3.2.1.4 in Appendix 7.5 such that the demand in the market schedule is not reduced when the IESO makes an emergency energy purchase. Market prices would then be determined on the basis of meeting the total market demand, including that served by the emergency energy purchase. An emergency energy purchase would still be reflected as a reduction in demand in the constrained sequences so that other resources are dispatched appropriately to meet the net demand.
- Second, adding a new section 3.2.1.12 in Appendix 7.5 to enable the IESO, where software capabilities permit, to increase or decrease demand in the market schedule when the IESO undertakes an emergency control action which affects market demand. The purpose of the IESO increasing or decreasing market demand is to offset to the extent possible, the effect of the emergency control action on market demand in the market schedule. The emergency control action impact on demand would still be reflected in the constrained sequences. This amendment would allow the IESO and market participants to develop and implement potentially different solutions to counter-intuitive pricing caused by emergency control actions.

  This amendment also recognizes, through the phrase "where such impact can be determined with reasonable certainty" that there are emergency control actions which may affect market demand but for which the IESO may not be able to determine accurately the effect. For a voltage reduction, the IESO can only estimate the impact on market demand. A public appeal to reduce demand is an emergency control action but it is not possible to predict with any certainty the public response to an appeal and the resulting drop in market demand. The market rules should provide the IESO with the flexibility to adjust market demand under these different situations.

The expected result of these proposed amendments is that market prices would not drop in a counter-intuitive manner when the IESO implements an emergency control action that would historically have resulted in reduced market demand and market prices.

**PART 4 – PROPOSED AMENDMENT**

## 3.2 Inputs to and Form of the Market Scheduling and Pricing Process

3.2.1 The form of and inputs to the market scheduling and pricing process shall differ from the *dispatch* scheduling and pricing process described in section 2 only as follows:

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3.2.1.4 with the exception of *emergency energy* purchases, any imports or exports between the *IMO control area* and other control areas required

by the *IMO* to meet its obligations under requirements established by all relevant standards authorities and which are outside the normal market *bids* and *offers* shall not be represented directly but shall be represented as an increase or a decrease in *non-dispatchable load*. *Emergency energy* purchases shall not be represented as a decrease in *non-dispatchable load* in the *market schedule*;

…….

3.2.1.10 in accordance with section 4.13.1 of Appendix 7.5, the *market schedule* may use different trading period length to that of the *real-time schedule*; ~~and~~

3.2.1.11 in accordance with section 2.11.2 of Appendix 7.5, the *market schedule* may use a different ramp rate for *operating reserve* to that of the *real-time schedule*~~.~~; and

3.2.1.12 during any period when the *IESO* undertakes an *emergency* control action as described in the applicable *market manual* that affects market *demand*, the *IESO* shall, as software capabilities permit, adjust~~increase or decrease~~ market *demand* in the *market schedule* to offset the impact of the *emergency* control action on the market *demand* where such impact can be determined with reasonable certainty.

**PART 5 – IESO BOARD COMMENTS**

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# Market Rule Amendment Proposal

## PART 1 – MARKET RULE INFORMATION

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|---|---|---|---|---|
| Identification No.: | **MR-00296-R01** | | | |
| Subject: | **Market Pricing** | | | |
| Title: | **Emergency Control Actions and Counter-Intuitive Prices – Administrative Pricing** | | | |
| Nature of Proposal: | ☒ Alteration | ☐ Deletion | ☐ Addition | |
| Chapter: | 7 | Appendix: | | |
| Sections: | 8.4A | | | |
| Sub-sections proposed for amending: | Various 8.4A.2.4 (new), 8.4A.4, 8.4A.5, 8.4A.6, 8.4A.17.5 (new) | | | |

## PART 2 – PROPOSAL HISTORY – PLEASE REFER TO MR-00296-R00

| Version | Reason for Issuing | Version Date |
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**Summary**

Refer to MR-00296-R00.

This market rule amendment proposes that the IESO administer market prices after the fact using the existing administrative pricing provisions when the IESO determines that market prices have changed in a counter-intuitive manner as a result of the implementation of an emergency control action. A price change is counter-intuitive when the IESO determines that the change is not consistent with prevailing conditions.

This amendment would result in establishing market prices that approximate the market value of energy and operating reserve to the extent possible using market-derived prices from before or after the implementation of the emergency control action.

**Background**

Please refer to MR-00296-R00.

**Discussion**

When the IESO undertakes certain emergency control actions that affect demand in the market schedule this can result in market prices which may not reflect the conditions on the IESO-controlled grid. These emergency control actions include voltage reductions, emergency energy purchases, and non-dispatchable load shedding.

Only emergency energy purchases are represented as an IESO input to the dispatch algorithm. The administration of prices is necessary when the IESO may not be able to adjust demand in the market schedule to offset control action impact or to address any residual counter-intuitive pricing that may still occur.

The mechanism that is recommended by this market rule amendment proposal is the existing administrative pricing process. Using this existing process will allow for more timely implementation of this proposed solution than would be the case if a different price administration process was introduced. Upon the determination by the IESO that counter-intuitive prices have occurred, the IESO would use the existing price administration process to establish prices, after the fact, to a level experienced before or after the implementation of the emergency control action.

**PART 4 – PROPOSED AMENDMENT**

## 8.4A Administrative Pricing and Corresponding Schedules – Revised

8.4A.1 This section 8.4A applies only in respect of the establishment of *administrative prices* for the *real-time energy market* and the *operating reserve market.*

8.4A.2 The *IMO* shall establish *administrative prices* and, where applicable, corresponding *market schedules* when:

8.4A.2.1 the *energy market* or the *operating reserve market* has been suspended in accordance with section 13;

8.4A.2.2 the *IMO* is unable to *publish* an *energy market price* or *operating reserve market price* in accordance with section 8.1.2 due to a failure in or *planned outage* of the software, hardware or communications systems that supports the operation of the *dispatch algorithm*; ~~or~~

8.4A.2.3 the *IMO* determines, pursuant to guidelines approved by the *IMO Board* relating to price error materiality and acceptable causal events, that a *published energy market price* or *operating reserve market price* is incorrect due to incorrect inputs which affected the outcome of the *dispatch algorithm*; or

8.4A.2.4 the *IESO* has implemented one or more *emergency* control actions as described in the applicable *market manual*, and, the *IESO* determines that *operating reserve market prices* or *energy market prices* have changed as a result and in a manner that is not consistent with prevailing market conditions;

and all such *administrative prices* shall be the *energy market price* and the *operating reserve market price* for the applicable *dispatch interval* for all purposes under these *market rules*.

8.4A.3 Where the *IMO* establishes *administrative prices* pursuant to section 8.4A.2 it shall do so within two *business days* of the event causing *market prices* to be administered. The *IMO* shall inform *market participants* as soon as practicable whenever a *published market price* is an *administrative price*.

8.4A.4 In circumstances where *administrative prices* are required under sections 8.4A.2.2, ~~or~~ 8.4A.2.3, or 8.4A.2.4 the *IMO* shall establish *administrative prices* and corresponding *market schedules* that would, to the extent practical, reflect the *market prices* and corresponding *market schedules* that would have otherwise been produced by the *real-time markets*, but for the event causing *market prices* to be administered.

8.4A.5 Where the *IMO* establishes *administrative prices* pursuant to sections 8.4A.2.2, ~~or~~ 8.4A.2.3, or 8.4A.2.4 in respect of one or more *dispatch intervals*, it shall use the best available *dispatch data* for *energy* or *operating reserve*, as the case may be, pertaining to the *dispatch interval* to which the *administrative price* is to be applied and the *market prices* and corresponding *market schedule* for that *dispatch interval* shall be as the *IMO* determines appropriate consistent with the principle stated in section 8.4A.4, and shall be the *market price* and corresponding *market schedule* from:

8.4A.5.1 the closest preceding *dispatch interval* that has not been administered, up to a maximum of 24 *dispatch intervals*;

8.4A.5.2 the closest subsequent *dispatch interval* that has not been administered, up to a maximum of 24 *dispatch intervals*; or

8.4A.5.3 a combination of the closest preceding and closest subsequent *dispatch intervals* that have not been administered, provided that neither the preceding nor subsequent *dispatch intervals* are selected for more than 24 *dispatch intervals* and are applied in a continuous manner such that the *administrative price* chosen from the preceding *dispatch interval* shall apply until changed to the *administrative price* selected from the subsequent *dispatch interval*.

8.4A.6 Where the *IMO* establishes an *administrative price* pursuant to sections 8.4A.2.2, ~~or~~ 8.4A.2.3, or 8.4A.2.4 the *IMO* shall, if the need for *administrative prices* extends beyond 48 *dispatch intervals*, establish *administrative prices* for the remaining *dispatch intervals* of the event causing *market prices* to be administered within the *IMO control area* and the *intertie zones*, using an average *HOEP* for the *energy market* and the hourly average of the *operating reserve* prices for the applicable *dispatch intervals* for the *operating reserve markets*, determined from the corresponding hour or hours from each of the 4 most recent *business days* or non-*business days*, as the case may be, excluding those hours from any day in which *administrative pricing* has been established under this section. Prices for the excluded hours shall be replaced by prices that have not been administered under this section from the corresponding hours of the most recent earlier *business days* or non-*business days*, as the case may be.

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8.4A.17 The *IMO* shall cease to apply *administrative prices*:

8.4A.17.1 where section 8.4A.2.1 applies, from the commencement of the first *dispatch interval* in the *dispatch hour* referred to in section 13.7.1.2;

8.4A.17.2 where section 8.4A.2.2 applies due to a failure in software, hardware or communications systems, from the commencement of the first *dispatch interval* after the failure referred to in that section has been rectified;

8.4A.17.3 where section 8.4A.2.2 applies due to a *planned outage* of software, hardware or communications systems, from the commencement of the first *dispatch interval* after the *planned outage* referred to in that section has been completed; ~~and~~

8.4A.17.4 where section 8.4A.2.3 applies, from the commencement of the first *dispatch interval* after the incorrect inputs referred to in that section have been corrected; and

8.4A.17.5 where section 8.4A.2.4 applies, from the commencement of the first *dispatch interval* after the *operating reserve prices* or *energy market prices* ~~,~~referred to in that section are no longer inconsistent with prevailing market conditions.

## PART 5 – IESO BOARD COMMENTS

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