



Market Rule Amendment Submission

This form is used to request an amendment to, or clarification of, the *Market Rules*. Please complete the first four parts of this form and submit the completed form by email or fax to the following:

Email Address: Rule.Amendments@ieso.ca

Fax No.: (416) 506-2847 Attention: Market Rules Group

Subject: Market Rule Amendment Submission

All information submitted in this process will be used by the *IESO* solely in support of its obligations under the *Electricity Act, 1998*, the *Ontario Energy Board Act, 1998*, the *Market Rules* and associated policies, standards and procedures and its licence. All submitted information will be assigned the *confidentiality classification* of “Public” upon receipt. You should be aware that the *IESO* will *publish this amendment submission* if the *Technical Panel* determines it warrants consideration and may invite public comment.

Terms and acronyms used in this Form that are italicized have the meanings ascribed thereto in Chapter 11 of the *Market Rules*.

PART 1 – SUBMITTER’S INFORMATION

Please enter contact information in full.

Name: IESO Staff

(if applicable) *Market Participant /
Metering Service Provider No.*¹: N/A

Market Participant Class:
N/A

Telephone: 905-403-6955

Fax: _____

E-mail Address: rule.amendments@ieso.ca

PART 2 – MARKET RULE AMENDMENT SUBMISSION INFORMATION

Subject: Operating Reserve (OR) Requirements

Title: Reducing Synchronized OR Requirement due to Regional Reserve Sharing Program Changes

Nature of Request (please indicate with x)

Alteration Deletion Addition Clarification

Chapter: 5

Appendix: _____

Sections: _____

Sub-sections proposed for amending/clarifying: 4.5.6B

¹ This number is a maximum of 12 characters and does not include any spaces or underscore.

PART 3 – DESCRIPTION OF THE ISSUE

Provide a brief description of the issue and reason for the proposed amendment. If possible, provide a qualitative and quantitative assessment of the impacts of the issue on you and the *IESO-administered markets*. Include the Chapter and Section number of the relevant *market rules*.

On April 27, 2007, the Northeast Power Coordinating Council, Inc. (NPCC) approved changes to its Regional Reserve Sharing program (RRS). The changes allow participating areas to reduce their synchronized and/or non-synchronized ten-minute operating reserve (OR) requirement by a total of 100 MW when the associated energy is available and deliverable (increased from 50 MW and non-synchronized ten-minute reserve only). An NPCC study concluded that the change in reliability associated with sharing ten-minute synchronized reserve is negligible (see study results attached). The IESO participated in the NPCC study and endorses the conclusions.

The existing market rules regarding RRS permit the IESO to reduce its requirement for domestic supply of non-synchronized ten-minute reserve by up to 100 MW. A market rule amendment is required to allow the IESO to reduce its synchronized ten-minute OR requirement by 100 MW, as permitted by the changes approved by NPCC.

The IESO supports NPCC's changes to RRS because the changes are consistent with the objects of the IESO established under the Electricity Act. One of the legislated objects of the IESO is "to operate the IESO-administered markets to promote the purposes of the Electricity Act"¹, of which one such purpose is "to promote economic efficiency and sustainability in the generation, transmission, distribution and sale of electricity"².

Reducing the synchronized ten-minute OR requirement by 100 MW in accordance with the approved change to RRS should promote economic efficiency because the change would maintain an acceptable level of reliability at a lower cost to the market. Additional competition in the synchronized ten-minute reserve market is expected to have downward pressure on price. Generally, the synchronized portion of the ten-minute operating reserve commands a higher price than the non-synchronized portion. In 2006, the average price for synchronized ten-minute operating reserve was \$3.56/MWh whereas the average price for non-synchronized ten-minute operating reserve was \$1.68/MWh.

Background

NPCC is the Regional Reliability Council (RRC) for Northeastern North America. NPCC's mission is to "promote the reliable and efficient operation of the interconnected bulk power systems in Northeastern North America through the establishment of criteria, coordination of system planning, design and operations, and assessment of compliance with such criteria."³

In June 2005, NPCC approved a voluntary program of 100 MW of regional reserve sharing (RRS). The purpose of the RRS is to improve regional reserve market efficiency in a manner that maintains reliability.

Although RRS allows for 100 MW of energy to be delivered under the program in the event of contingency, initially each participating area was only permitted to count 50 MW towards its non-synchronized ten-minute OR requirement, subject to availability and deliverability of the associated energy. The provision to count only 50 MW towards the OR requirement was imposed by NPCC's

¹ Electricity Act, 1998, 5.(1)(g)

² Electricity Act, 1998, 1.(g)

³ Source: NPCC web site at <http://www.npcc.org/default.cfm>

PART 3 – DESCRIPTION OF THE ISSUE

Reliability Coordinating Committee (RCC) pending a review by the Task Force on Coordination of Operation of the effectiveness of the RRS six months after implementation. RRS was implemented on January 4, 2006.

A November 2006 report on RRS prepared by the Control Performance Working Group (CO-1) of the Task Force on Coordination of Operation concluded that:

- “RRS in its present form has been successful in promoting reliability and should be continued.
- Consideration should be given to allowing regional reserve sharing energy to count towards ten-minute synchronized reserve requirements in the future.”⁴

Based on the conclusions of the CO-1 report and subsequent discussions, NPCC’s RCC approved changes to RRS that allow participating areas to reduce their synchronized and/or non-synchronized ten-minute operating reserve (OR) requirement by a total of 100 MW when the associated energy is available and deliverable.

Participation

Participation in RRS is voluntary. The extent of participation among NPCC Balancing Areas is varied as illustrated in the table below:

	Count 50 MW Contribution	Provide Assistance	Receive Assistance
NYISO	No	Yes	Yes
ISO-NE	No	Yes	Yes
IESO	Yes	Yes	Yes
NBSO	Yes	Yes	Yes
HQTE	N/A	N/A	N/A
PJM (member of ReliabilityFirst RRC)	N/A	N/A	N/A

- Of the 5 NPCC members, only IESO and New Brunswick System Operator (NSBO) reduce their domestic OR requirements.
- NYISO does not have the authority to reduce its OR requirement. The change would require a tariff change which is a lengthy and involved process.
- ISO-NE does not reduce their OR requirement because of tools issues.
- Hydro-Québec TransÉnergie (HQTE) is not able to participate in RRS because they do not participate in Shared Activation of Reserve (SAR) which is a prerequisite for participation in RRS.
- Although PJM is not a member of NPCC, PJM participates in SAR but does not participate in RRS because of concerns about reducing their OR market. These concerns must be considered in the context that the total OR requirement for the ReliabilityFirst region is smaller than NPCC’s total

⁴ Source: NPCC web site at <http://www.npcc.org/PublicFiles/openProcess/C-3820070312clean.pdf>

PART 3 – DESCRIPTION OF THE ISSUE

regional OR requirement.

Utilization

Since RRS was implemented (January 2006), there has only been one contingency event that resulted in a request for, and delivery of, the energy associated with the RRS. On May 30, 2006, the IESO lost a 500 kV transmission line in northeastern Ontario and received 100 MW of RRS assistance from NYISO. The IESO was counting 50 MW of RRS towards satisfying its non-synchronized ten-minute reserve requirement at the time of the contingency.

In accordance with the NPCC Procedure for Operating Reserve Assistance (NPCC Procedure C-38), a participating area may count a contribution of 100 MW towards its ten-minute reserve requirement provided that the energy associated with RRS, if requested, would be available and deliverable.

The IESO does not reduce its ten-minute OR requirement if the energy associated with RRS is not available from the group of other participating areas or not deliverable to Ontario due to transmission constraints.

In 2006, the energy associated with RRS was not deliverable to the IESO during approximately 204 hours (or 2.3% of time). Therefore, the IESO did not reduce the 10-minute non-synchronized OR requirement by 50 MW during those hours.

Reliability Impacts

The NPCC CO-1 review of the RRS concluded that NPCC Balancing Areas and Reliability Coordinators have not experienced any negative reliability impacts resulting from the implementation of RRS. Based on the conclusions of the CO-1 report, NPCC's RCC approved the change to RRS to allow participating areas to reduce their ten-minute reserve requirement by 100 MW (the full amount of the energy associated with RRS that may be shared following a contingency). The IESO concurs with NPCC's CO-1 review and supports NPCC's changes to RRS because the changes are expected to promote efficiency while maintaining an acceptable level of reliability.

Price Impacts

Since the Ontario energy clearing price (MCP) is a co-optimization of energy and operating reserve, a reduction in the requirement for operating reserve is expected to have downward pressure on energy and operating reserve prices.

The change identified in this amendment submission would likely exert downward pressure on prices because the change would likely result in additional competition in the synchronized ten-minute reserve market. Further analysis of the price impacts of the proposed change is underway.

Market Efficiency Impacts

The purpose of RRS is to improve regional reserve market efficiency in a manner that maintains reliability. RRS promotes productive efficiency in the Northeast markets in that it results in fewer resources being needed to maintain the same level of reliability. Further analysis of the efficiency impacts of the proposed change is underway.

PART 4 – PROPOSAL (BY SUBMITTER)

Provide your proposed amendment. If possible, provide suggested wording of proposed amendment.

Amend section 4.5.6B of Chapter 5 by removing the “non-synchronized” portion of the reference to the ten-minute operating reserve requirement. This would allow the IESO, when participating in RRS, to reduce its synchronized and/or non-synchronized ten-minute reserve requirement by a total of 100 MW when the energy associated with RRS is available and deliverable.

PART 5 – FOR IESO USE ONLY

Technical Panel Decision on Rule Amendment Submission: Warrants consideration

MR Number: MR-00332

Date Submitted to *Technical Panel*: 17 May 07

Accepted by *Technical Panel* as: (please indicate with x) Date:

General Urgent Minor 22 May 07

Criteria for Acceptance:

1. The amendment submission identifies means to better enable the market to satisfy the market design principle of efficiency. Allowing the 100 MW of energy associated with RRS to count towards the synchronized ten-minute OR requirement is expected to improve market efficiency while maintaining an acceptable level of reliability.
2. The expected or perceived benefits of the amendment exceed the expected or perceived costs of implementation. During the development of the suggested rule amendments, the IESO would conduct a cost-benefit analysis of the proposed change.

Priority: High

Criteria for Assigning Priority:

- A high priority is warranted due to the pervasiveness of the problem. In this case, there is the opportunity for efficiency gains while maintaining an acceptable level of reliability. Improvements in market efficiencies that maintain an acceptable level of reliability benefit the market as a whole.

Not Accepted (please indicate with x):

Clarification/Interpretation Required (please indicate with x):

Technical Panel Minutes Reference: IESOTP 202-1

Technical Panel Comments: None

Estimating the Change in Reliability of 100 MW of Synchronized Reserve Sharing Among IESO, NYISO, ISO-NE, and NBSO*

May 6, 2005

Introduction

The prospective NPCC Reserve Sharing Agreement (C-38) may be implemented at some future date with all participating control areas counting 100 MW of reserve sharing energy deliverable as ten minute synchronized reserve from the other control areas. If a control area includes 100 MW of ten minute synchronized reserve sharing energy in its Unit Commitment process, it may have 100 MW less ten minute synchronized reserve indigenous to it. There is a potential for as much as 400 MW less ten minute synchronized reserve among the NPCC control areas, though all four control areas might not have one less committed generator due to reserve sharing on the same day. CO-1 has been charged to estimate the impact of counting reserve sharing energy as ten minute synchronized reserve in the Unit Commitment process.

The estimation can be performed in different ways. In the method that follows, it recognizes that a single control area is far more likely to experience an adverse reliability event (as opposed to a total regional energy deficiency) due to the unexpected unavailability of reserve sharing energy that was counted as ten minute synchronized reserve in the Unit Commitment process. Including it in the Unit Commitment process could result in the displacement of indigenous resources that could have provided it if the displaced indigenous resources were committed. The estimation method builds on the well-received method that was used to assist in justifying the extension of NPCC's Disturbance Recovery Period from 10 to 15 minutes. This method uses an updated and somewhat enhanced version of the ISO-NE model used in that previous increased risk exposure study. CO-1 believes that the use of ISO New England as the reference control area for this analysis yields results that are representative of the change in reliability for the other participating control areas.

The Results

Basically, the results indicate that the change in reliability associated with sharing ten minute synchronized reserve during Unit Commitment is negligible. The expected changes in the occurrence of adverse reliability events are summarized in the table below.

Table 1 - Years between Adverse Reliability Events

Case	Ten minute recovery	Fifteen Minute Recovery	Fifteen Minute Recovery – always 100 MW short	Fifteen Minute Recovery – rarely 100 MW short
2 trips per unit per year, negative ACE constraint always applicable	2898.6	2506.9	2429.3	2506.5

* This document was prepared by the CO-1 Working Group of NPCC's Task Force on Coordination of Operation.

Case	Ten minute recovery	Fifteen Minute Recovery	Fifteen Minute Recovery – always 100 MW short	Fifteen Minute Recovery – rarely 100 MW short
2 trips per unit per year, negative ACE constraint applicable half the time	5797.2	5013.8	4858.6	5013.1
1 trip per unit per year, negative ACE constraint always applicable	11594.1	10027.3	9717.0	10026.6
1 trip per unit per year, negative ACE constraint applicable half the time	23188.2	20054.7	19434.0	20053.3
3 trips per unit per year, negative ACE constraint always applicable	1288.3	1114.2	1079.7	1114.0
3 trips per unit per year, negative ACE constraint applicable half the time	2576.5	2228.4	2159.4	2227.9

One observation is that the reliability is reduced by less than 1.5 years for all of the above scenarios when the reserve sharing energy is “statistically highly available”. A second observation is that the reduction in reliability assuming that the reserve energy would never be available (compared with fifteen minute standard recoveries) is much less than the reduction incurred by extending the recovery period from 10 to 15 minutes.

The above calculations correlate well with the durations between reportable resource losses in excess of 500 MW (300 MW for Maritimes) in the NPCC. In 7 years, there were only 6 occurrences of reportable resource losses among all NPCC control areas that were within one hour of each other. Only 2 of these were within the same area, with the closest being 16 minutes apart. Note also that recoveries have an average value of 6 minutes, so the actual exposure to a second contingency is substantially less than the boundary conditions evaluated above. Finally, in the above cases, the analyses assumed that an ACE of –1900 MW would cause a severe reliability event 100% and 50% of the time. Specific to ISO New England, the applicability of the large negative ACE constraint is estimated to be about 15% in 2005.

Other Modeling Approaches

It is clear that the probability of a regional reliability problem being caused exclusively by sharing synchronized reserve is far more unlikely. For example, an intermediate variable assigns a probability of about .0004 of an adverse reliability event in a year with the reserve sharing energy never being available when requested. For a second area to end of in the same place coincidentally, the probability of both happening together assuming independence is .00000016. So it seems that a single area analysis is far more relevant. Note that the synchronized reserve sharing would not be done in the Unit Commitment phase on days deemed to have high risk

During periods not including a contingency, the unexpected unavailability of the reserve sharing energy has about the same effect as a 100 MW load forecast error. Errors of this magnitude are

usually resolved without incident. All control areas have emergency procedures that would be effective for scenarios occurring at a pace slower than the scenarios included in this study.

In summary, the this study seems to have the necessary and sufficient elements in it to conclude that the risks associated with using synchronized reserve sharing energy for normal days in the Unit Commitment phase is infinitesimal.