



## 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](mailto: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: <u>IESO Staff</u>	
(if applicable) <i>Market Participant / Metering Service Provider</i> No. <sup>1</sup> : <u>n/a</u>	<i>Market Participant Class</i> : <u>n/a</u>
Telephone: <u>905-855-6464</u>	Fax: <u>905-855-6371</u>
E-mail Address: _____	

### PART 2 – MARKET RULE AMENDMENT SUBMISSION INFORMATION

Subject: <u>Enhanced Day-Ahead Commitment Process (EDAC)</u>	
Title: <u>24 Hour Optimization and 3-part Offers</u>	
Nature of Request (please indicate with x)	
<input checked="" type="checkbox"/> Alteration	<input type="checkbox"/> Deletion
<input type="checkbox"/> Addition	<input type="checkbox"/> Clarification
Chapter: <u>7, 11</u>	Appendix: <u>7.5A (new)</u>
Sections: <u>Various</u>	
(assumes need for defined terms)	
Sub-sections proposed for amending/clarifying: <u>Various</u>	

<sup>1</sup> 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*.

#### **Background on Enhanced Day-Ahead Commitment Process**

In 2007, the IESO initiated a study to assess how IESO day-ahead mechanisms might be amended to support anticipated changes in Ontario's electricity sector. The study addressed both current and future challenges including how to most efficiently integrate and optimize Ontario's changing infrastructure. The merits of various possible day-ahead mechanisms were studied and assessed under [Stakeholder Engagement Plan 21 \(SE-21\)](#).

Cost benefit analysis (CBA) techniques were used to help identify day-ahead mechanism improvements that would result in net benefits to the province as a whole relative to the current day-ahead commitment process (DACP). The cost-benefit analysis included both IESO and stakeholder costs and compared them to benefits measured through overall market efficiency impacts.

The results of the analysis, described in "Day-Ahead Market Evolution Preliminary Assessment"<sup>1</sup> published on May 5th, 2008, identified an enhanced day-ahead commitment process (EDAC) with an energy forward market (EFM) as the most prudent choice for implementation.

Following a review of assessment with stakeholders, the IESO day-ahead team recommended, and the IESO Board of Directors agreed at its June 19, 2008 meeting, to proceed with a stepped approach for moving forward, starting with the design of the common elements of the differing options.

These common elements are:

- Optimization of commitment over the entire 24 hours of the next day;
- Use of multiple passes of the constrained algorithm to determine commitment and resource scheduling; and
- Three-part offers, i.e. the use of offers for energy supported by submitted 'fixed'<sup>2</sup> costs and technical data.

From the results of the preliminary work, the large majority of stakeholders and Stakeholder Advisory Committee (SAC) members concluded that the proposed design of the common elements, the principles behind the cost guarantees, and the inclusion of exports were acceptable because they would benefit the province. SAC indicated they would like to see these elements progress, while proceeding to review EFM alternatives on a separate timeline.

At its meeting on September 5, 2008 the IESO Board granted approval for the development of the common elements (described above) and delegated to the Audit Committee of the IESO Board the responsibility for oversight of the EDAC project.

On February 11, 2009 the IESO's Audit Committee approved version 1.0 of the EDAC Market Design and directed IESO staff and the Technical Panel to develop the market rule amendments necessary to implement the design.

The following design document outlines the design details for the common elements, export inclusion and day-ahead guarantees for both generators and importers:

<sup>1</sup> [http://www.ieso.ca/IESOweb/pubs/consult/se21/se21-20080505\\_DAM\\_Assessment\\_Report.pdf](http://www.ieso.ca/IESOweb/pubs/consult/se21/se21-20080505_DAM_Assessment_Report.pdf)

<sup>2</sup> Typically includes unit start-up and minimum generation costs (commonly referred to as 'fixed costs' although this may not meet the formal accounting definition of a fixed production cost).

**PART 3 – DESCRIPTION OF THE ISSUE**

[http://www.ieso.ca/imoweb/pubs/consult/se21-edac/se21-20090206-EDAC\\_Market\\_Design\\_v1.pdf](http://www.ieso.ca/imoweb/pubs/consult/se21-edac/se21-20090206-EDAC_Market_Design_v1.pdf)

**MR-00348 Overview**

MR-00348 will be based upon the existing Day-Ahead Commitment Process market rules architecture currently contained within Chapter 7. This is proposed because many of the existing features of the Day-Ahead Commitment Process (DACP) will be used for the Enhanced Day-Ahead Commitment process. Although the project associated with this effort is EDAC, the end result, in terms of the market rules will be a modified day-ahead commitment process as expressed with new rules. When the new day-ahead commitment process goes into effect sometime in 2011 the existing DACP market rules would be replaced in total by the new market rules at that time.

The existing sections in Chapter 7 that would be impacted by MR-00348 include the following:

- Section 2.2 Registered Facilities
- Section 2.2C Generation Facility Eligibility for the Day-Ahead Generation Cost Guarantee
- Section 3.3A Dispatch Data Submission for the Day-Ahead Commitment Process
- Section 3.7 Self-Scheduling Generators
- Section 3.8 Intermittent Generators
- Section 3.8A Transitional Scheduling Generators
- Section 5.1 Purpose and Timing of Pre-Dispatch Schedules
- Section 5.8 The Day-Ahead Commitment Pre-Dispatch Scheduling Process
- Section 6.3B.1 Real-Time Scheduling of Generation Facilities Eligible for the Day-Ahead Generation Cost Guarantee.

MR-00348, in essence, is a “modification” of the DACP market rules to reflect the enhancements to the design as expressed in Chapter 7. MR-00348 will identify all the data inputs required for the operation of the EDAC process, a description of the EDAC scheduling process, and the algorithm that is the heart of the calculation engine. The EDAC results would then flow into real-time market operations and would also inform the calculation of settlement amounts. This amendment also introduces Appendix 7.5A for the articulation of the new calculation engine market rules.

In addition to the sections noted above, section 1.7 of Chapter 7, “IESO Authorities and Obligations Regarding the Time Period During Which the Day-Ahead Commitment Process Functions” and section 5.1 “Purpose and Timing of Pre-Dispatch Schedules” will also require changes. However, additional detailed design work needs to be completed before the potential market rule changes can be clarified. If that detailed design work requires more time to be completed it is possible the market rule amendments required for this section would be undertaken in 2010.

The Enhanced Day-Ahead Commitment Process – Settlement Equations and Guarantees will be contained within MR-00349 will be brought forward on a separate timetable which is expected to be completed by year end.

Finally, it is anticipated there may either be modifications to existing definitions in Chapter 11 and/or the introduction of new defined terms to facilitate the EDAC design.

**PART 4 – PROPOSAL (BY SUBMITTER)**

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

It is proposed to modify the market rules in Chapter 7 in the following manner to reflect version 1.0 of the EDAC design:

**Section 2.2 Registered Facilities**

- Modify section 2.2.6B to specify that a registered market participant for a dispatchable generation facility shall add to the information to be provided to the IESO the maximum number of starts per day for the facility, the minimum down time for the facility, and for a facility which takes more than an hour to move from start-up to its minimum loading point, the time period.
- Modify section 2.2.6D by removing the maximum number of starts per day. The permission to submit this information is being converted into an obligation under section 2.2.6B.
- Insert a new subsection 2.2.6G to permit registered market participants for dispatchable generation facilities that wish to be considered in the enhanced day-ahead commitment process as a pseudo-unit model to submit to the IESO the following information: single steam turbine contribution to each combustion turbine; the pseudo-unit capacity ranges, defined as a percentage of PSU's maximum capacity and the combustion turbine/steam turbine contribution (share) for each PSU capacity range. If this information is provided to the IESO, the IESO would then be obligated to use this information during the operation of the enhanced day-ahead calculation engine.

**Section 2.2C Generation Facility Eligibility for the Day-Ahead Generation Cost Guarantee**

- Modify the section title to reflect the change from Generator Cost Guarantee to Production Cost Guarantee
- Modify section 2.2C.1.4 to specify the information that registered market participants must provide to the IESO in order to be eligible to receive the Day-Ahead Production Cost Guarantee. The combined guaranteed costs would be eliminated and replaced by as-offered start-up costs and as-offered speed no-load cost and the facility must also take greater than one hour to move from start-up to its minimum loading point.
- Delete section 2.2C.2. The provision of information prior to the operation of the enhanced day-ahead commitment calculation engine results in a competitive outcome therefore the need to audit cost information which is currently submitted after the current DACP process is completed is no longer required.

**Section 3.3A Dispatch Data Submission for the Day-Ahead Commitment Process**

- Modify section 3.3A.2 to specify the timelines for dispatch data submissions. There is also a need to specify facilities which registered market participants would like to operate in

**PART 4 – PROPOSAL (BY SUBMITTER)**

segregated mode in real-time would be required to submit dispatch data.

- Modify section 3.3A.5 to specify the timelines for dispatch data submissions for import offers and export bids. There will also be a need to modify this section to reflect the guarantees that would apply to those import offers that were scheduled as a result of the submitted dispatch data.
- Modify section 3.3A.6 to specify the permissions and timing for the submission of dispatch data from registered market participants for energy limited resources.
- Modify section 3.3A.7 to specify the information the IESO shall use to determine and publish the initial pre-dispatch schedule.
- Modify section 3.3A.8 to reflect the EDAC equivalent of the existing pre-dispatch of record.
- Delete section 3.3A.10 because the Hour Ahead Dispatchable Load program has been eliminated.

**Section 3.7 Self-Scheduling Generators**

- Modify section 3.7.3 to specify the timelines for the submission of dispatch data from self-scheduling generators.

**Section 3.8 Intermittent Generators**

- Modify section 3.8.2 to specify the timelines for the submission of dispatch data from intermittent generators.

**Section 3.8A Transitional Scheduling Generators**

- Modify section 3.8A.2 to specify the timelines for the submission of dispatch data from transitional scheduling generators.

**Section 5.8 The Day-Ahead Commitment Pre-Dispatch Scheduling Process**

- Modify the section title to reflect that pre-dispatch is no longer used in determining the Day-Ahead Scheduling Process.
- Modify section 5.8.1 to identify when the enhanced process starts and to delete reference to those bids or offers which were previously excluded from the DACP process. There will also be a need to clarify that the enhanced process shall use the new EDAC calculation engine set out in a new Appendix 7.5A (see below).

**PART 4 – PROPOSAL (BY SUBMITTER)**

- Modify section 5.8.2 to identify the timing of the release of the results of the enhanced process.
- Delete section 5.8.3 because the EDAC design clearly states that the IESO would only constrain for reliability after the enhanced process was completed.
- Modify section 5.8.4 to specify that the registered market participant for a facility which was scheduled by the enhanced process must accept the guarantees associated with that scheduling.
- Modify section 5.8.5 to specify the IESO’s obligations in regard to the scheduling of a facility that has been selected by the enhanced process.
- Modify section 5.8.6 to reflect the enhanced design.
- Modify section 5.8.7 to clarify whether or not the IESO may disregard the net inertia scheduling limit during the cross-over from the day-ahead to real-time.
- Delete section 5.8.8 to reflect the fact that section 5.8.3 is being deleted. Since there are no constraining actions being undertaken by the IESO during the enhanced process the need to notify the market of such constraint activity is no longer necessary.

**Section 6.3B.1 Real-Time Scheduling of Generation Facilities Eligible for the Day-Ahead Generation Cost Guarantee**

- Modify the section title to reflect the change from Generator Cost Guarantee to Production Cost Guarantee
- Modify section 6.3B.1, as required, to specify that if the IESO has to de-synchronize for reliability reasons, a facility that received a guarantee as a result of the enhanced process that facility will retain any EDAC guarantees. Additionally the registered market participant for that facility would also retain its permission to apply to the IESO for additional compensation.
- Modify section 6.3B.2 by reflecting the change to a Generation Production Cost Guarantee and deleting the reference to the registered market participant accepting the guarantee.

**Appendix 7.5A – EDAC Calculation Engine (new)**

- Insert a new appendix 7.5A “EDAC Calculation Engine” in the market rules.
- The enhanced process will be driven by an EDAC calculation engine composed of multiple passes. The multi-pass calculation engine will determine the optimal unit commitment and constrained dispatch over a 24-hour period for energy and operating reserves.

**PART 4 – PROPOSAL (BY SUBMITTER)**

- The three passes are constrained schedules. The security of the day-ahead schedules will need to be assessed with the consideration of transmission constraints. Therefore, the solution for the three passes will include multiple iterations between the scheduling function and the security assessment function of the EDAC calculation engine. The iterations will continue until no new security violations are identified.
- The appendix would include all the equations representing the three-pass EDAC calculation engine. These market rules would include a description of the calculation engine's purpose, its optimisation objective (to maximize the gain from trade), its basic inputs (e.g. valid EDAC bids and offers, modelling of constraints, etc.) and its basic outputs.
- The three passes are as follows:
  - Pass 1: Commitment Pass. Calculation engine performs a least as bid/as offered cost (from submitted bids and offers), security constrained unit commitment and scheduling to meet average forecast demand and operating reserve (OR) requirements for each hour of the next day. This pass aims to minimize the total costs to serve average demand for the next day.
  - Pass 2: Reliability Pass. Calculation engine performs a least as bid/as offered cost (from submitted bids and offers), security constrained unit commitment and scheduling to meet peak forecast demand and operating reserve requirements for each hour of the next day. This pass aims to minimize the total costs to serve peak demand for the next day.
  - Pass 3: Day-Ahead Scheduling Pass. For this third and final pass, the engine calculates day-ahead constrained schedules to meet average forecast demand for all resources for each hour of the next day. Pass 2 unit commitments and imports schedules will be used as an input to Pass 3. The energy from generator units ramping up to their minimum loading points is also considered when determining the constrained schedules for all resources in Pass 3.

**PART 5 – FOR IESO USE ONLY**

*Technical Panel Decision on Rule Amendment Submission:* Warrants Consideration

MR Number: MR-00348

Date Submitted to *Technical Panel*: March 24, 2009

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

General       Urgent       Minor

Date:

April 1, 2009

**PART 5 – FOR IESO USE ONLY**

Criteria for Acceptance: MR-00348 identifies means to better enable the market to satisfy the market design principles. The EDAC design provides a solution that enhances the efficiency of the current day-ahead commitment process for the scheduling and commitment of resources required to provide electricity supply on a daily basis.

Priority: High

Criteria for Assigning Priority: Pervasiveness of the problem.

Not Accepted (please indicate with x):

Clarification/Interpretation Required (please indicate with x):

Technical Panel Minutes Reference: 224-1

Technical Panel Comments: \_\_\_\_\_