

ISSUE 4: USE OF 12-TIMES RAMP RATE IN THE DISPATCH UNCONSTRAINED ALGORITHM

Date Raised

April 2002.

Description

Within the real-time unconstrained (market) schedule sequence, the energy ramping capability of all dispatchable facilities is assumed to be 12 times higher than the actual ramping ability. This means that the market schedules for these facilities and the uniform market clearing price for Ontario are set using ramp capability equal to what can be achieved in 60 minutes, rather than 5 minutes.

Background

This feature was implemented via a change to an adjustable input parameter of the dispatch algorithm in April 2002, just prior to market launch. ~~Market Rules appendix 7.5 section 4.13.1 was changed by an urgent market rule amendment to authorize this feature.~~ The need for this was based on results during the last phase of market testing in April of 2002, where there was extreme real-time price volatility during periods of large change in market demand – e.g. morning load pick-up, hour-to-hour changes in intertie transactions. Also observed were significant differences between the pre-dispatch prices and real-time prices. This price volatility resulted from a lack of ramp depth of scheduled lower priced resources in a single interval, so higher priced resources were required to be dispatched to meet the large demand change. Some volatility in prices is to be expected during these periods, however the level of volatility observed during the market testing was judged to be unacceptable.

Market Rules appendix 7.5 section 4.13.1 was changed by an urgent market rule amendment to authorize this feature on April 18, 2002. This rule specifies a parameter called “Trading Period Length” for each of the pre-dispatch, real-time constrained and real-time market schedules. This is actually a time period – 60 minutes for the pre-dispatch schedules and 5 minutes for the real-time constrained schedule – not a multiplier times ramp rate, however the effect is the same. For the real-time market schedule, the revised Market Rule states that this parameter will be set to “a variable number of minutes, as determined by the IMO.” A Market Rule change is not required to change this parameter to 5 minutes (equivalent to 1 times ramp rate) or any other value.

Why a Pricing Issue

The use of 12 times ramp rate has been an issue since it was first implemented. When approved by the IMO Board, it was approved as a temporary measure with the intent that a more efficient long-term solution would be found to

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replace it. Therefore, there is an expectation that it will be changed and/or removed at some point. Because the effects of the 12 times ramp rate are largely to reduce the severity of upward spikes in price, different market sectors are divided over the appropriateness of keeping or removing this feature.

The use of 12 times ramp rate impacts the principles of efficiency and transparency. When affected by the 12 times ramp rate, the market clearing price is not reflective of the precise cost of producing the energy required to meet the market demand at that time. Also, the use of 12 times ramp rate reduces the simplicity of the price calculation, including the added complication of congestion management settlement credits (CMSC) payments and can result in prices that are not entirely consistent with expectations.

Impacts of Issue

Market Impact

Real-time market clearing prices are determined on the basis that the market has 60 minutes of ramping capability in 5 minutes. This has a dampening effect on prices during periods of large demand change. During periods of rapid demand increase, higher priced and fast responding resources are required to be dispatched by the constrained sequence to meet demand, but these resources are constrained on and are not reflected in the market clearing prices. This effect on price is due to the fact that the unconstrained sequence is able to dispatch lower priced and slower moving resources to meet the demand increase and therefore set the price lower than that of the fast moving resources. This also results in increased payments of CMSC due to the increase in constrained resources.

Similarly, lower priced resources must be constrained off during periods of rapid demand reduction as higher priced and slower moving resources cannot reduce output quickly enough. The market clearing prices are therefore set by the higher priced resources that the unconstrained sequence is able to dispatch down very quickly. This again results in an increase in CMSC.

Participant Impact

[To be developed]

IMO Processes and Procedures Impact

No significant impact identified. The ramp rate is defined by an existing software parameter that is easily changed. A change to this parameter would not require a Market Rule change, as the rule covering the ramp rate is not specific. Prior to any change to this parameter, the IMO would be required to follow the normal change process for a Market Participant facing change, including consultation with stakeholders.

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Related Issues

- 002: Publishing Nodal Price Data
- 005: Simultaneous Use of Ramping Generation Units for Energy and Operating Reserve
- 012: Under-commitment of Available Generation
- 016: Historical Analysis of Nodal Prices
- 022: Pricing Physical Constraints
- 025: Temporal Optimization Differences between Constrained & Unconstrained Sequences
- 027: Differences in Inputs Between Unconstrained and Constrained Real-Time Sequences

Options Considered

[To be developed]

Selected References

Market Rule Amendment numbers MR-00189-R00, R01, R02
12xRR Presentation to MPWG – June 11, 2004