

ISSUE 12: UNDER-COMMITMENT OF AVAILABLE GENERATION

Date Raised

Noted in the May 2003 Pricing Team Report.

Description

During some periods when the IMO scheduled imports to meet domestic energy and operating reserve demands, there had been a considerable amount of spare domestic generation that could have been producing but were not on-line, for operational and economic reasons. Potentially having to rely on out-of-market sources of operating reserve when under such circumstances there was physically enough domestic generation to meet the market demands is neither consistent with the goals of reliable operation of the IMO-controlled grid, nor with the efficient operation of the market. Moreover, such reliance on out-of-market operating reserve can reduce the extent of the emergency control actions available to the IMO in the event of actual contingency events.

In response to this under-commitment of available domestic generation, the IMO implemented a Spare Generation On-Line program. This initiative offers participants market-based incentives to be on-line thereby providing the market and system with “shock absorption” capability in the form of additional dispatchable generation, specifically during shoulder periods¹. The program accomplishes this by guaranteeing the recovery of start-up and minimum generation costs for those domestic generation facilities that qualify and choose to participate.

Background

During periods of high demand, most generation in Ontario is available to the IMO-administered market. However, during lower demand periods (e.g. off-peak and shoulder periods) when not all Ontario generation is required to meet the demand, some generation capacity that is available but not operating, i.e. is not brought on-line, is unable to be called upon to produce electricity in real-time. This generation capacity is typically fossil-based requiring an extended and expensive start-up period. In addition, for technical reasons, these units typically must stay on for a minimum period of time once they have started up. As start-up costs need to be recovered through the generators’ offer prices, their submitted offers for short run times, can be uneconomic compared to imports and other facilities that can start up quickly, with little additional expense to the facility for starting up.

¹ Shoulder periods refer to times when market demands are such that all domestic resources are not required to be operating. Shoulder periods are typically in spring and autumn seasons and off-peak hours in summer and winter.

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As well, certain fossil generating units also need to begin their start-up operations well before they know whether their offer will be economic and scheduled/dispatched in real-time. Consequently, a generator may incur the costs to start up, but would not be able to recover those costs if they are not actually scheduled/dispatched to generate. Even if they are scheduled and dispatch on in real-time, they could be subsequently dispatched off before they have generated long enough to fully recover their start-up costs, or they may be dispatched off at a time when shutting down might result in physical problems for their unit.

Such generating units may remain off-line under such conditions. Consequently, if there is a sudden increase in Ontario demand or a sudden decrease in other supply, these units are typically not available to the market to respond because of the time required for them to start-up and come on-line. Ontario demand may then have to be met by more expensive domestic generation and/or imports and/or out-of-market sources of operating reserve.

A review of the first 11 months of market operation indicated that 57% of the time when the IMO used out-of-market sources of operating reserve, there was spare generation in Ontario available but not operating². Moreover, 47% of the time when the IMO used out-of-market sources of operating reserve, the capacity of the spare generation available but not operating exceeded the amount of out-of-market sources of operating reserve used.

Relying on out-of-market sources of OR reduces the emergency control actions available to the IMO in the event of actual contingency events, thereby increasing the possibility of the need to shed non-dispatchable load. In their May 28, 2003 report, the Market Pricing Issues team also identified the counter-intuitive impact on market pricing and signals due to the use of out-of-market sources of OR as a significant concern in the market.

In response to these market efficiency and reliability concerns, the IMO developed and implemented the Spare Generation On-Line program. This program was intended to provide the market and system with some “shock absorption” capability to address “disturbances” without the unnecessarily extreme market and resource impacts previously observed. The program offers a market-based incentive and mechanism for available spare generation to be on-line in shoulder periods. Effected through Market Rule Amendment MR-00235 the voluntary program provides a guarantee of recovery of start-up and minimum generation costs for domestic generation facilities that participate. The rule amendment was approved by the IMO Board, effective August 2003.

² Appendix F, Market Pricing Issues Report from May 28, 2003

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The Spare Generation On-Line program is comparable and consistent with similar programs provided in neighboring markets and jurisdictions. The guarantee of generator costs is also consistent with features of the day-ahead market currently under development by the IMO.

Impacts of Issue

Market Impact

This initiative should reduce the frequency of the need for the IMO to use out-of-market control actions in response to market and system changes in real-time. It is also intended to provide a measure of stability and predictability, both in terms of reduced price spikes and fewer instances of counter-intuitive pricing.

Participant Impact

The initiative should also reduce resource dispatch volatility and the resulting impacts on market participant equipment damage, reliability and related issues.

Related Issues

- 001: Pre-Dispatch Price Sensitivity
- 008: Multi-Part Bids/Offerers
- 009: Use of Peak Demand Load Forecast in Pre-dispatch
- 010: Over-Forecasting of Demand in Hour 23, 24
- 013: Impact of Out of Market Resources on the Market
- 014: Hour(s)-Ahead Price Signal Uncertainty
- 015: Restriction on Changes to Dispatch Data between 4 and 2 Hours Ahead of Dispatch Hour
- 027: Timing Differences Between Unconstrained and Constrained Real-time Sequences

Options Considered

[To be developed]

Selected References

Market Pricing Issues Team Report – May 28, 2003

http://www.theimo.com/imoweb/pubs/consult/mktOps/mo_paper_PricingIssues_20030528.pdf

Market Rule Amendment MR-00235 - Market Incentives to Increase Spare Generation On-Line/Including Control Action Sources of Operating Reserve in the Market – August 6, 2003

http://www.theimo.com/imoweb/pubs/mr/mr_00235-R00-R05_BA.pdf