ISSUE 33: RULES FOR DETERMINING PRICES IN TIMES OF SHORTAGES

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Description
A shortage condition occurs when there is insufficient energy or operating reserve offers or bids to satisfy demand. There can be an energy shortage or an operating reserve shortage and they may happen simultaneously.

When an OR shortage occurs the DSO will reduce demand by 2 MW more than the amount of the shortage and recalculate price and schedules using the modified demand. This will ensure that the shortage price for OR is set by a valid offer or bid and not a DSO penalty function[1].

An energy shortage automatically results in the maximum price of $2000/MWh

Background
The current shortage pricing rules were a implemented in the real time market as a component of the original Control Action Operating Reserve (CAOR) work program. CAOR allows the IESO to place standing offers in the reserve market to represent control actions that are available to IESO operators. Before CAOR was implemented when the IESO operators lowered the operating reserve demand it had the effect of lowering market demand and thus lowering price resulting in counter-intuitive price changes. CAOR has corrected this counterintuitive price changes when control room operators utilize Control Actions covered by CAOR. With the addition of CAOR the IESO had changed control room procedures such that the operating reserve requirements are no longer lowered, except following operating reserve activation.

Another circumstance when counterintuitive price changes were observed was the purchase of emergency energy from neighbouring jurisdictions and the use of voltage reductions in times of system stress. These counterintuitive price drops were the result of a decrease in market demand in the amount of the action taken and resulted in counterintuitive price drops. In August 2005 the IESO implemented new procedures for when these emergency actions are taken. The new procedures have eliminated the occurrence of counter intuitive prices when these actions are taken.

[1] The objective function of the Dispatch scheduling and Optimisation program includes penalty terms for violating energy demand, operating reserve requirements and transmission constraints. These penalty terms allow a solution to be produced even if one or more constraints can not be enforced. The penalty costs associated with these penalty terms are set to very high values to ensure that they are used only in case of infeasible solution (the associated constraint can not be enforced).

Why a Pricing Issue

The rules for determining prices in periods of shortages affect the level of compensation for dispatchable resources and the signals sent to the market participants during these periods. Prices should be set to encourage market participants to offer more resources in the market during the shortage periods. This may be done by delaying or cancelling outages, starting fossil units, reducing demand and, in the long term, build more generators.

Impact of Issue

Market Impact

The market Clearing Prices for energy and operating reserve have a direct impact on generation availability and demand levels in the market. These in turn could aggravate or eliminate shortage conditions. Prices should increase as the market approach shortage condition. The prices should be at a level that will help prevent the shortage conditions from happening.

The prices should also increase further when shortage conditions actually happen. This will encourage the offer of more resources and decrease in demand that will help eliminate or reduce the severity of the shortage.

The IESO believes that the addition of CAOR and the practice of adjusting the market demand when emergency energy is purchased, or voltage reductions are implemented, has provided the market with the correct price signals in times of shortage. The escalating offers prices of CAOR ensure that operating reserve prices rise as shortage conditions are approached and if a shortage conditions arises the shortage pricing rules will ensure that energy and operating reserve prices are set by a valid bid or offer.

Participant Impact

[To be developed]

IMO Processes and Procedures Impact

Related Issues