

# Reviewing Outstanding Issues – Issue 5, 11, 30, 33

MPWG

July 19, 2007



- Issues description
- Proposed Action and Rationale
- Request for MPWG feedback

- Pre-dispatch sequence of DSO:
  - Respect actual ramping constraints
  - Available operating reserve is adjusted for energy output

## Example :

- A 500 MW unit with an energy ramp rate of 5 MW/min and is economically scheduled for increase of 150 MW of energy
- Maximum possible pre-dispatch OR schedule = 150 MW  
(5 MW/min \* 60 min – 150 MW energy dispatch)

- Real-time constrained sequence of DSO:
  - Respects actual ramp rates
  - Available operating reserve is adjusted for energy output

## Example:

- A 500 MW generating unit with an energy and OR ramp rate of 5 MW/min and is currently producing 100 MW
- Receives a dispatch instruction to 125 MW (5 MW/min \* 5 min)
- Max 10 minute OR schedule = 25 MW  
(5 MW/min \* 10 min – 25 MW energy dispatch)

Note: no other ISO applies this constraint

- Real-time Unconstrained sequence of DSO
  - Respect actual ramp rates for OR and uses a ramp rate multiplier for energy (currently 12X)
  - Available OR is not adjusted for energy output to allow some OR to be scheduled from units scheduled for energy in the market schedule

## Example:

- A 500 MW generating unit with an energy and OR ramp rate of 5 MW/min and is currently producing 100 MW
- Energy dispatch of 400 MW ( $5 \text{ MW/min} * 12 * 5 \text{ min}$ ) + 100 MW
- Max 10 minute OR schedule =  $5 \text{ MW/min} * 10 \text{ min} = 50 \text{ MW}$
- Actual 10 minute OR schedule = 50 MW

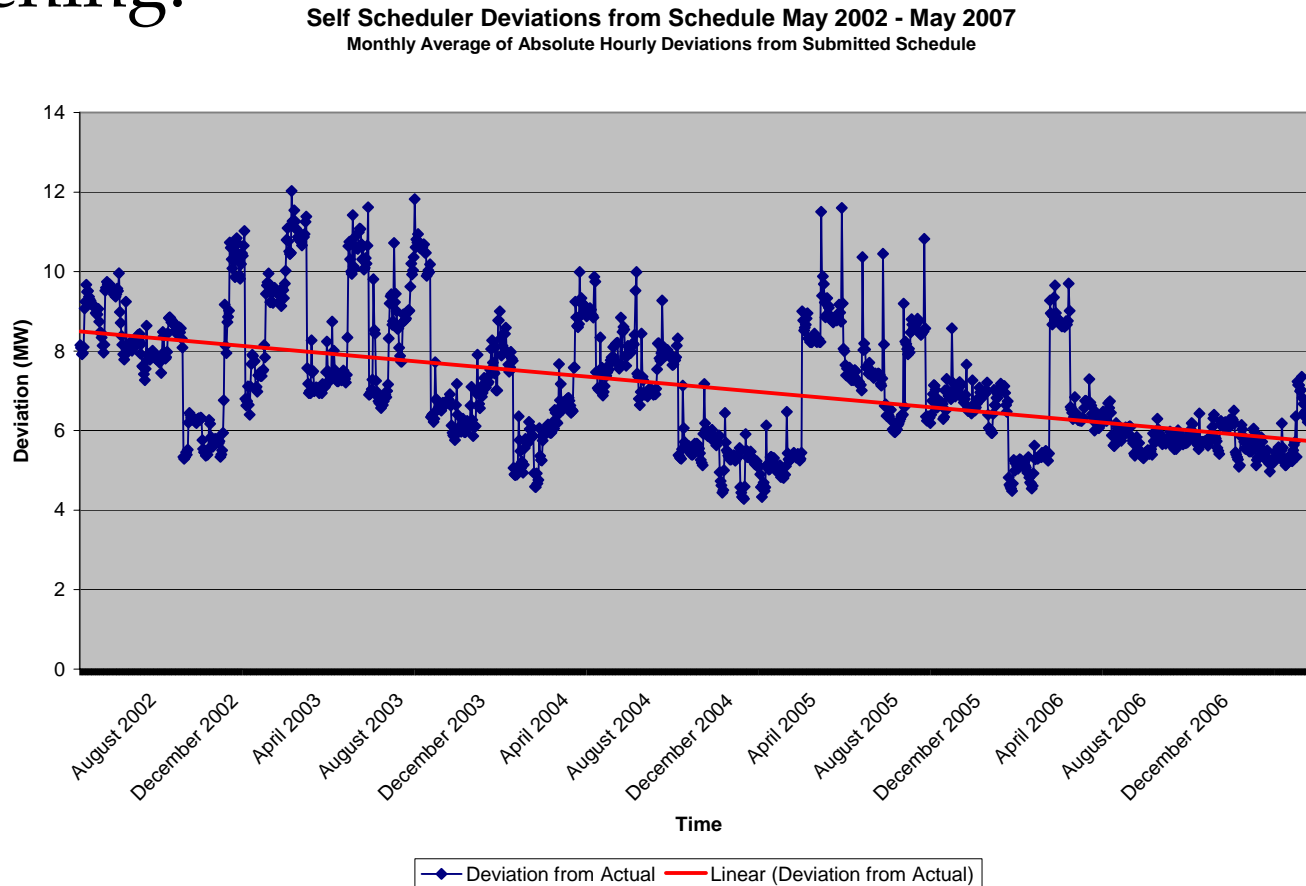
- Impact of this Pricing Methodology:
  - OR (and co-optimized energy) prices are likely slightly muted due to units providing both energy and OR when ramping.
  - Overall effect on efficiency thought to be very small with the presence of any energy ramp rate multiplier

- IESO Proposal:
  - The IESO proposes to close this issue.
  - The dispatch constrained algorithm adjusts the available OR from a ramping unit correctly: reliability impact of counting on “double-counting” capability of resources could be significant
  - The market efficiency impact of RT treatment is expected to be very small
  - Significant work effort required to confirm this: not justified

- SSG's don't receive dispatch instructions and are not allowed to offer OR
- SSG's submit schedules of their expected output
- Submitted schedules are used in pre-dispatch
- In real time the current actual output is used as a forecast for the dispatch interval if the submitted schedule for the next dispatch interval doesn't change.
  - If the submitted schedule does change from one dispatch interval to the next, the schedule is used as a forecast for dispatch

- SSG forecasts impact the scheduling of resources in pre-dispatch and
  - If the SSG forecast is higher than actual, pre-dispatch would have scheduled less resources than if the schedule were correct
  - If the SSG forecast is lower than actual, pre-dispatch would have scheduled more resources than if the schedule were correct
- Scheduling of resources in pre-dispatch can affect the real-time price and reliability depending upon the supply stack at the time

- SSG forecasts have improved since market opening:



- IESO Proposal:
  - The IESO proposes to close this issue
  - SSG forecasts have improved since market opening
  - Deviations of self schedulers are “noise” relative to the total supply
  - Current treatment is appropriate as we are using the best information available for each scheduling sequence
  - IESO continues to work with the SSG’s (and intermittent generators) to further improve their forecasts

- March 2003 MSP report stated that pre-dispatch prices are consistently higher than the HOEP and are a poor predictor of HOEP
- MSP has identified several factors contributing to the differences between the pre-dispatch and real-time prices, including demand forecast error and failed inter-tie transactions
- More recently raised by a working group member who stated that a more accurate forecast of HOEP is necessary to facilitate OPA demand response programs

- **Optimal Technologies:**
  - “...a very crucial role for price forecasting closer to real time and also the communication of prices in an effective manner to assist market participants and others to improve market efficiency”
  - “...the interval volatility every 5 minutes. These prices can be quite variable especially during high ramp periods. The ability to react to sudden price increases is limited unless automated. Sufficient response from customers will enable the HOEP to avoid that high price interval, as that last generation supply source will not need to be dispatched”
- **Other Stakeholders**
  - IESO, as market operator, should not forecast market prices
  - Knowledge of factors that influence price may be more valuable than a (bad) price forecast
  - During DAM discussions, non-dispatchable consumers have indicated value in day-ahead HOEP forecast

- IESO Proposal:
  - IESO proposes to close this issue
  - A forecast of the real-time 5-minute interval prices is not feasible and will not be pursued
  - As part of DAM initiative, IESO conducting studies of a day ahead HOEP forecast: refer to SE-21

# Issue 33: Rules for Determining Price in Times of Shortage

- A shortage condition occurs when there are 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
- An energy shortage automatically results in the maximum energy price of \$2000/MWh

- Many work programs have addressed shortage pricing:
  - Emergency Energy and Voltage Reductions
    - Implemented new procedures to not reduce demand in market schedule as a result of these control actions. Eliminates counter-intuitive price drops and increases the probability of shortage pricing.
  - Control Action Operating Reserve (CAOR)
    - CAOR eliminates counter-intuitive price drops, provides signals to the market that shortage conditions are approaching
  - No longer reduce operating reserve requirement when shortfall foreseen

- IESO Position:
  - IESO proposes to close this issue
  - Counter-intuitive price drops as a result of control actions have been reduced
  - Existing shortage pricing determinations appropriate given uniform pricing methodology

Issue	IESO Proposal
5: Simultaneous use of Ramping Generation Units for Energy and Operating Reserve	Close
11: Comparing Treatment of Self-Scheduling Resources in Pre-Dispatch and Real-time	Close
30: Forecast of Real-time Price	Close (being addressed through DAM initiative)
33: Rules for Determining Prices in Times of Shortage	Close

- The IESO requests MPWG members written feedback in support or opposition to the IESO proposals with supporting rationale.
- Please provide feedback by August 15, 2007
- [IESOmarketpricingworkinggroup@ieso.ca](mailto:IESOmarketpricingworkinggroup@ieso.ca)