



# Pricing Issues in the IMO-Administered Markets

March 23, 2004

# Objectives

- Seek input on the nature, extent and importance of various pricing issues that continue to exist in the IMO-administered markets
- Identify what has been done so far to address them and what is ongoing?
- Seek views on the resolution of pricing issues and how we should proceed.

# Key Pricing Issues Identified

- Pre-dispatch and real-time price divergence
- Prices during shortage and near shortage conditions (e.g. counter-intuitive prices)
- Size and content of hourly uplift costs
- Uniform versus congestion or LMP pricing
- Penalty factors (i.e. losses) used in shadow price and dispatch calculations

# Some Related Areas

- Dispatch instructions - volatility & level
- Demand Response - natural and directed
- Design of day-ahead market
- Interchange scheduling & transaction failures

# Identified Contributing Factors

- Load forecast - hourly peak vs. average for pre-dispatch
- Manual adjustments to Operating Reserve
- Impact of emergency purchases/sales
- 700 MW intertie ramp limit
- Bid/offer window
- Manual intervention in intertie scheduling
- “12x ramp rate”

# Recent Pricing Event

- Off-peak hours in recent days have seen pre-dispatch prices much higher than real-time and high IOG and CMSC payments.
- This has been caused by:
  - about 5000 MW of base load generation on outage
  - strong overnight electricity demand

# Recent Pricing Event (2)

- The relatively high PD prices attracted significant quantities of imports, which were scheduled up to the system capability.
- In RT, demand was lower than expected, but imports are already committed and cannot set price, so MCP is lower than PD price, resulting in high IOG amounts.

# Recent Pricing Event (3)

- Also, significant imports from the Michigan direction, combined with off-peak load in Southwestern Ontario resulted in internal congestion on the negative BLIP interface. This caused large CMSC payments to both generators west of BLIP and imports from Michigan.

# Internal Pricing Team

- Established in summer of 2002 in response to pricing issues identified by market participants and IMO staff
- Investigated contributing factors, developed and implemented new market features to address pricing issues
- Work continues

# Features Implemented

- Issue - Price during shortage conditions
  - **Spare Generation On-Line** - allows generators to commit units with assurance that start-up and minimum costs will be reimbursed.
  - **Control Action Operating Reserve** - standing reserve offer at fixed price for V/R instead of manual reserve adjustment at time of need

# Features Implemented (2)

- Issue - Price during shortage conditions (continued)
  - **Remove 200 MW Supplemental OR** - reduces OR requirement which provides more cushion before shortage condition is reached.

# Features Implemented (3)

- Issue - PD vs. RT price divergence
  - **Change to bid/offer windows** - eliminated restrictions on bids/offers between 4 and 2 hours ahead of RT
  - **Hour ahead dispatchable load** - allows dispatchable loads to make dispatch decision based on PD price, with cost guarantee.

# Pricing Team - Ongoing Work

- Issue - PD vs. RT price divergence
  - **12x ramp rate** - Investigate the reduction of the 12x ramp rate. Applying MIO to the unconstrained algorithm may allow the elimination of the 12x ramp rate.
  - **Manual adjustment of intertie transaction schedules** - Intertie transaction adjustments can aggravate PD/RT price divergence. Guidelines and procedures for this are being reviewed.

# Other Initiatives

- Multi Interval Optimization
  - MIO in the constrained algorithm - need to review pricing impacts once implemented.
  - Possible extension to the unconstrained algorithm.
- Day Ahead Market
  - provides financial commitment day ahead
  - reduces need to rely on pre-dispatch prices

# Other Initiatives (2)

- Congestion Pricing Review
  - Detailed analysis of shadow (nodal) prices has been done and continues
    - Results posted on the IMO web
    - Presented at the MOSC meeting on January 14, 2004.
  - The IMO held three workshops for participants to explain the mechanics of nodal pricing in December '03 and January '04.

# Other Initiatives (3)

- Congestion Pricing Review (cont.)
  - The analysis of historical shadow prices uncovered significant differences between average shadow prices and the uniform MCP
  - Differences caused by:
    - 12x ramp rate
    - regional demand/supply balance
    - different demand used for each calculation
    - other reasons

# How Best to Move Forward?

- Priority of issues?
- Nature of stakeholdering?
- Stakeholder participation?