

Market Rules Assessment Real-Time Generation Scheduling and Performance - Update -

**Market Issues Working Group
May 24, 2007**

Outline of Today's Presentation

- Background
- Progress Update
 - ✓ *Review Action Items along with underlying questions*
 - ✓ *Review initial observations from associated analysis*
 - ✓ *Assess potential next steps*
- Propose Next Steps

Background – Purpose of Initiative

- Review the market rules associated with **Real-Time Generation Scheduling and Performance**, identify opportunities for improvement, and formulate solution proposals for subsequent prioritization.

Background – Scope

- Market rules associated with Real-Time Generation Scheduling and Performance, specifically:
 - ✓ *Penalties*
 - Purpose, Efficacy, Exemptions
 - ✓ *Compensation (general)*
 - Energy, Guarantee Payments (e.g., BPCG, DAMAP), RT Fuel Cost Representation,
 - ✓ *Dispatch Performance*
 - Dragging
 - ✓ *Load Following Needs and Ramp Capacity*
 - Incentives

Background – Proposed Process

- Begin with Market Participant input.
 - ✓ *Specific sessions to solicit MP feedback on specific issues and understand supporting reasoning. (March 16, 2007; March 28, 2007)*
- NYISO will subsequently document the key issues identified and attempt to collect data for further analysis of the impact and magnitude of each issue.
- NYISO will summarize key analysis findings for Market Participant review and comment.
- Where appropriate, NYISO will subsequently formulate conceptual straw proposals for qualified issues.
- NYISO and MPs will iterate through straw proposals to ensure that the integrated recommendations are consistent and suitable to purpose.

Background – Proposed Schedule

- Initial MP input sessions March-April
- Data collection and analysis May-June
- Straw proposal formulation July-August
- Status reports to MIWG Ongoing
- Goal to provide specific project recommendations to BPWG in support of 2008 budget and prioritization process

Action Items from Input Sessions

- As posted following the input sessions, to provide additional insight for consideration, the NYISO committed to a set of action items related to the following topics:
 - ✓ 1 – *Penalties*
 - ✓ 2 – *Physical / Ideal Dispatch*
 - ✓ 3 – *Amount of Dispatchable Capacity*
 - ✓ 4 – *Real-Time Transaction Bids / Schedules*
 - ✓ 5 – *Dragging*

Action Item 1 – Penalties

- **Conduct an analysis of penalties including the following considerations:**
 - ✓ *What is the market impact of the current penalty structure (under-generation penalty collection and over-generation non-compensation)?*
 - ✓ *When do penalties typically occur, at specific times of the day or continuously? Are they associated primarily with testing and start up periods?*
 - ✓ *Are penalties typically incurred by the same generators?*
 - ✓ *Investigate the PJM and NE methodologies on penalties, or lack thereof, and evaluate their regulation requirements relative to system size.*

Penalties – Initial Observations

- Reviewed monthly penalty collection of under-generation and non-compensation for over-generation over a 6 month period (10/06 – 03/07)

	OCT '06	NOV '06	DEC'06	JAN '07	FEB '07	MAR '07	TOTAL
Under Gen	\$344,801.61	\$374,636.80	\$280,802.80	\$408,482.15	\$559,130.67	\$365,078.01	\$2,332,932.04
Over Gen	\$1,541,554.31	\$1,502,416.09	\$1,656,178.82	\$1,704,756.29	\$2,075,127.32	\$1,792,643.04	\$10,272,675.87
Totals	\$1,886,355.92	\$1,877,052.89	\$1,936,981.62	\$2,113,238.44	\$2,634,257.99	\$2,157,721.05	\$12,605,607.91

Average Monthly Penalty = **\$2.1 M**
 Represents **0.053%** of Average Monthly Revenue for the Period

- Regulating units are included which will overstate the uncompensated over generation values
- Average Monthly Real-time LBMP used in Calculation

Penalties – Initial Observations (cont.)

- **A relatively small subset of generators (4%) account for nearly half (47%) of the under-generation penalties collected**
 - ✓ *Of this subset, a significant portion was incurred during start-up periods – despite the availability of an exemption accommodation*
- **Initial research did not reveal a clear trend in non-compensable over-generation charges**
 - ✓ *Additional analysis might provide additional insight*
- **On average, smaller units are subjected to penalties more frequently than larger facilities**
 - ✓ *Three percent of a smaller number provides less tolerance*

Penalties – Initial Observations (cont.)

- All ISO / RTO markets rely on some mechanism to encourage predictable generator performance
 - ✓ *PJM and ISO-NE penalize off-schedule performance via special treatment in the establishment of LMP (i.e., off-schedule units are excluded from pricing setting)*
- NYISO received Market Participant feedback stressing the need (from both reliability and market perspectives) for a mechanism to encourage on-schedule performance
 - ✓ *Penalties were not established to simply recover the incremental costs associated with each units deviation from schedule, but also to encourage the behavior needed to ensure the reliability and optimization of the system overall*

Penalties – Fundamental Questions

- **Are current penalties too severe?**
- **Are current penalties effective?**
- **Are performance penalties necessary?**
- **Are the penalties applied fairly and equitably?**

Penalties – Discussion

- **Are current penalties too severe? Are they effective?**
 - ✓ *Difficult to determine without additional analysis*
 - ✓ *Reviewing penalty dollars as percentage of total revenue provides additional perspective but still does not yield conclusions*

- **Potential follow-up questions:**
 - ✓ *How do we measure the effectiveness of existing penalties?*
 - ✓ *How much would we expect to collect from effective penalties?*
 - Would minimal collection suggest they are working?
 - Would excessive collection suggest they are not severe enough?

Penalties – Discussion

- **Are performance penalties necessary?**
 - ✓ ***A market mechanism to encourage on-schedule performance is necessary to maintain reliability***
 - Each ISOs / RTO employs a mechanism to encourage desired behavior
 - Changes to the current NYISO mechanisms would require consideration of other alternatives as a replacement

Penalties – Discussion

- **Are the penalties applied fairly and equitably?**
 - ✓ ***NYISO has attempted to structure market rules so that penalties only apply when the behavior that they seek to encourage is controllable and the penalties are therefore avoidable***
 - Accommodations exist for conditions when control is not possible and penalties would be unavoidable:
 - Start-up / shut-down periods
 - Testing periods
 - Intermittent resources (i.e., wind power)
 - Out of merit treatment for unexpected performance issues
 - ✓ ***Existing rules appear to subject certain facilities to more frequent and / or severe penalties***
 - E.g., current formula subjects smaller resources to a tighter performance tolerance than larger units

Penalties – Possible Next Steps

- **Additional analysis could be conducted in an effort to:**
 - ✓ *Determine effectiveness of existing penalties*
 - ✓ *Further illustrate the distribution of penalties across different type / size of units and further understand the underlying causes of any trends identified*

Ideal and Physical Dispatches and Dragging

Action Item 2

- **Provide clarification of the MW values incorporated in the ideal and physical dispatches when a unit is off schedule.**

Action Item 5

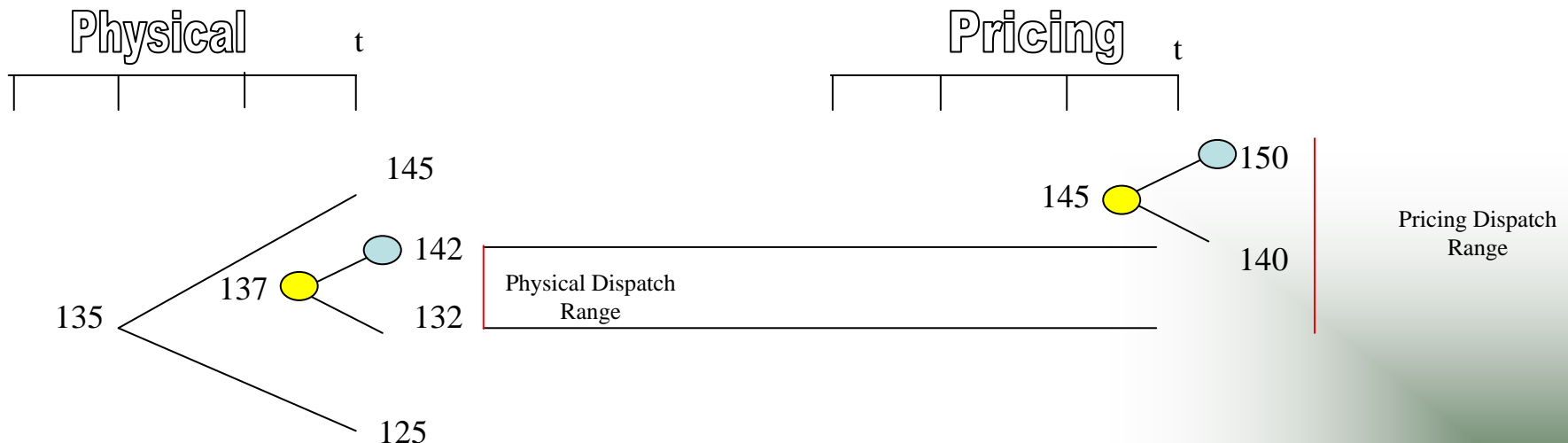
- **Provide any available metrics on dragging beyond the pricing aspects discussed in the State of the Market Report.**

Base Points for Flexible Units – Explanation

- **Base Point used in Physical Dispatch:** Most economic point that unit is capable of getting to based on ramping from prior physical basepoint, limited by its ramp capability from its metered output level at the time of RTD initialization.
- **Base Point used in Pricing Dispatch:** Most economic point determined using the max range based on the physical dispatch limits and ramping of prior pricing Base Point.
- **RTD Basepoint sent to Generator:** Same as Base Point used in Physical Dispatch.

Base Points for Flexible Units – Example

- t = interval in question
- Most Economic Point (for t): 150
- Actual MW ($t-10$): 135
- Physical BP ($t-5$): 137
- Pricing BP ($t-5$): 145
- Ramp Rate: 1 MW/Min
- Physical BP (t): 142
- Pricing BP (t): 150
- RTD BP (t): 142



Dispatch/Dragging – Fundamental Questions / Discussion

- **To what extent does off schedule generation impact pricing?**
 - ✓ *Dragging generation and the effect of accumulating base points for pricing can lead to counterintuitive pricing outcomes*
 - ✓ *NYISO's Independent Market Advisor highlighted this issue in the 2006 State of the Market Report*
 - Recommendation #4 proposes a possible solution for consideration

Dispatch/Dragging – Possible Next Steps

- **As per State of the Market Report recommendation, consider re-calibrating the dispatch levels in the pricing pass for units that are not responding to dispatch signals**
 - ✓ *This should be evaluated in conjunction with review of penalty structure*

Action Item 3 – Percentage of On Dispatch

- **What is the percentage of NY units that are on dispatch as compared to off dispatch?**

Percentage of Dispatch – Definitions

- **Dispatchable Resource** – Any resource providing a flexible bid whose upper and lower levels differ
- **Dispatchable MW** – Difference between UOL and MinGen
- **RTD Load Following MW** – 5 minutes of Ramping Capability available on Dispatchable Resources

Percentage of Dispatch – Initial Observations

- Reviewed the capacity offered in the Day Ahead and Real Time markets from a sampling of summer / winter days in 2006

Season / Market 2006 Sample Days	Total Capacity Bid	Dispatchable Capacity Bid	Dispatchable % of Capacity Bid	Dispatchable MW Bid (UOL – MinGen)	RTD Load Following MW
Winter DAM	34,800 MW	20,300 MW	58%	13,550 MW	2,200 MW
Winter HAM	26,300 MW	12,900 MW	49%	8,830 MW	1,380 MW
Summer DAM	35,100 MW	20,600 MW	59%	13,900 MW	2,430 MW
Summer HAM	35,100 MW	20,800 MW	59%	14,425 MW	2,090 MW

Percentage of Dispatch – Fundamental Questions / Discussion

- **Is there enough dispatchable generation in the NYCA?**
 - ✓ *Analysis completed thus far does not appear to suggest a lack of sufficient dispatch capacity state wide*
 - ✓ *How much is necessary to ensure reliable operation of the NY Control Area?*

- **Do adequate incentives exist to maintain a sufficient level of dispatch capacity long term?**
 - ✓ *There are existing mechanisms that provide additional value to dispatchable capacity such as BPCG, DAMAP, and generator dispatch consistent with market conditions*
 - ✓ *Are these incentives sufficient?*

Percentage of Dispatch – Possible Next Steps

- **Additional analysis could be conducted in an effort to:**
 - ✓ *Identify the amount of existing dispatchable capacity in different locations*
 - ✓ *Review list of scheduled resource retirements and additions to determine if any shift in the amount of dispatchable capacity is expected in the future*
 - ✓ *Quantify the value of existing mechanisms that provide extra compensation for on-dispatch generation*

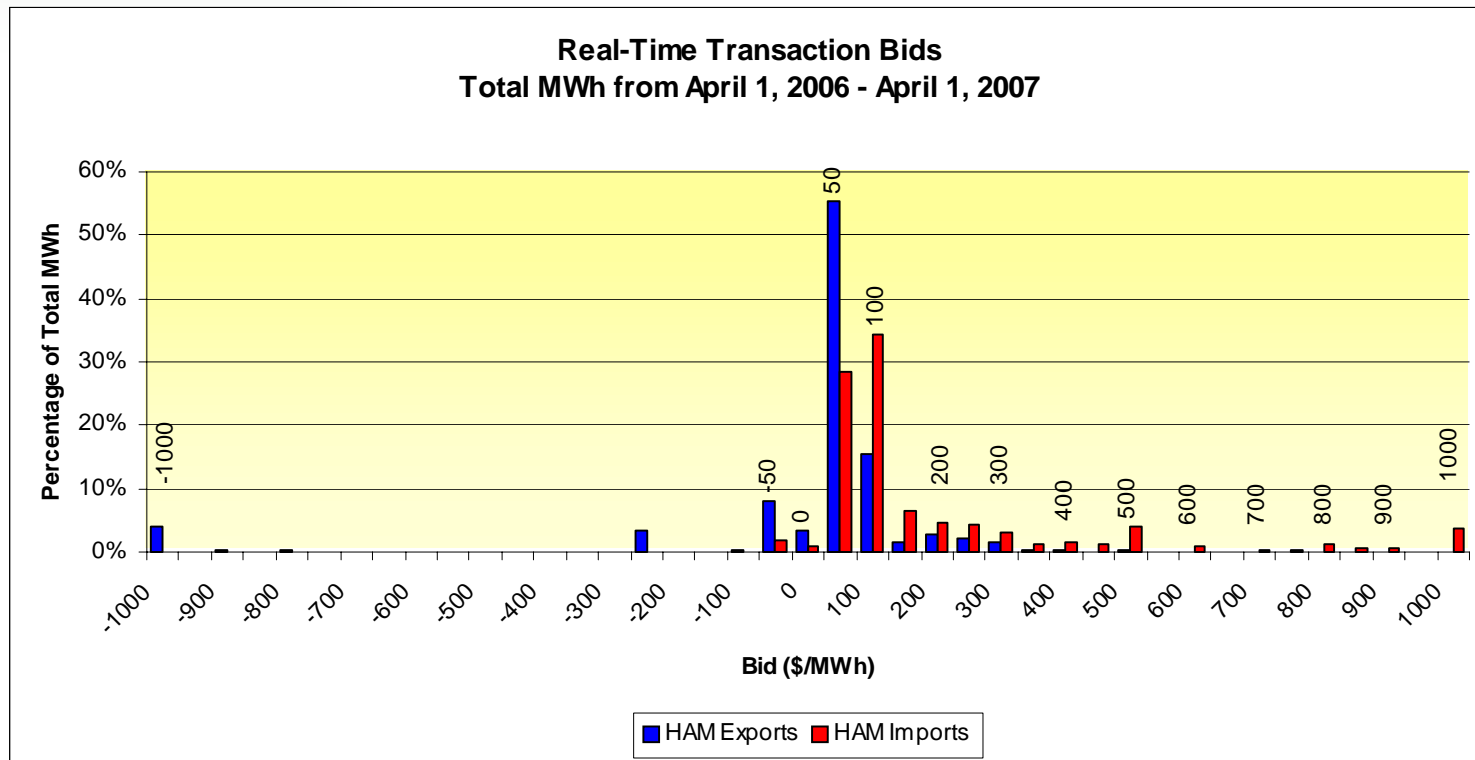
Action Item 4 – Transactions

- **Perform an evaluation of real-time transaction bidding behavior to assess if the majority of imports/exports are essentially bid as price takers. Is there an indication that transactions are bid to incorporate a protection mechanism rather than reflecting truly price sensitive bids? Note: Potomac Economics may offer valuable insight into this analysis.**

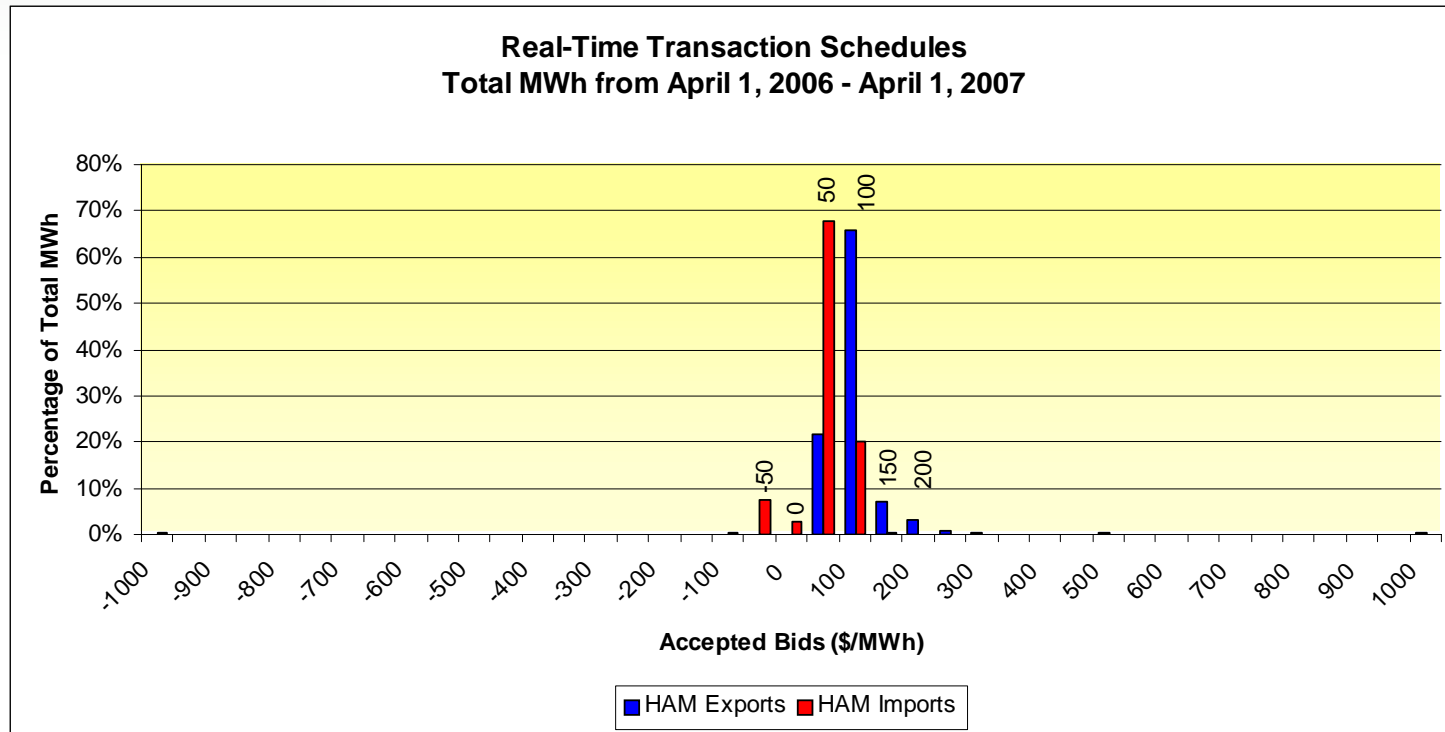
Transactions – Analysis

- **The analysis is based on the following:**
 - ✓ *Data from April 1, 2006 through April 1, 2007*
 - ✓ *Separate evaluation of imports and exports*
 - ✓ *Total MWh bid and scheduled during the period*

Transactions – Initial Observations



Transactions – Initial Observations



Transactions – Fundamental Questions / Discussion

- **Does the economic evaluation of transactions in real-time provide any value to the marketplace?**
 - ✓ *There are a significant number of transactions that can be considered price sensitive bids*
 - ✓ *The analysis confirms that there is participation in the RT market with approximately 40% of bids placed in RT and 30% of the Scheduled MW stemming from RT bids*

Transactions – Possible Next Steps

- **Additional analysis could be conducted in an effort to:**
 - ✓ *Evaluate efficiency of real-time transaction scheduling (perhaps by interface)*
- **Alternatively, since this topic is relatively independent from other Scheduling and Dispatch items, it could be considered separately**

Proposed Next Steps (Overall)

- **Conduct follow-up analyses identified for penalties, dispatchable capacity, and dragging assessments**
- **Defer further analysis of real-time transaction efficiency to allow focus on other topics**
- **Review observations from follow-up analyses at future MIWG meeting and discuss appropriate next steps. For example:**
 - ✓ *Is additional information required? If so, what types of analyses are necessary?*
 - ✓ *Are changes warranted? If so, what types of modifications should be considered for straw proposal formulation?*
 - E.g., Recalibration of dispatch levels in the pricing pass