

Market Rules Assessment Comparison of RTC & RTD

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Background – Purpose of Initiative

- ◆ In the 2007 State of the Market report, Dr. Patton indicates, “Prices between New York and adjacent markets have not been well-arbitraged.” The report also recommended the NYISO, “*evaluate potential improvements in its real-time commitment model (“RTC”) and the real-time dispatch model (“RTD”) to improve their consistency.*”
- ◆ Market Participants have indicated an interest in the efficiency of RTC’s forecast and scheduling at the external interfaces.
- ◆ Previous presentations have focused on differences between NE pricing, PJM pricing and NY pricing.

Purpose of Today's Presentation

- ◆ This presentation will focus on three topics:
 - *Causes of divergence between RTC pricing and RTD pricing at OH.*
 - *Detailed look at internal RTC-RTD divergence causes.*
 - *Evaluation of reducing 75 minute bid lockout.*

OH Analysis

OH Price Difference Drill Down

- ◆ Analysis was done for hours where NY and OH's RT prices of the border were significantly different. The top 10 hours of positive spread divergence (NY prices where higher) and top 10 hours of negative spread divergence (OH prices where higher), were analyzed.
- ◆ In 85% of these hour the cause of this divergence can be attributed to random and/or unforecastable events.
 - *3 of the 10 hours with negative spreads and 6 of the 10 hours with positive spreads, were linked to post RTC transaction cuts by control areas other than NY.*
 - *The remaining hours are spread rather evenly across Thunder Storm Alerts, Load forecast differences, and Electric facility trips and/or derates.*

OH Top 10 Negative Spreads

NYISO-OH									
Negative Price Spread – Uneconomic NYISO Imports									
Date	Hour	OH	Total NYCA		NY-OH	Real-Time Prices			Notes
		Actual* Imports	Actual* Imports	RTC* Imports	Price Difference	New York	OH	PJM	
7-23-08	HB 15	1486	4075	4002	-760.73	-690.94	69.79	127.47	TSA; transaction cuts
8-7-08	HB 19	615	3085	3775	-547.70	-500.91	46.79	60.88	TSA
5-13-08	HB 1	0	1408	1540	-497.40	-478.98	18.42	50.01	Facility derate
7-23-08	HB 22	248	3568	3568	-457.06	-413.65	43.41	50.77	TSA
5-17-08	HB 1	-105	1912	1812	-450.92	-439.06	11.86	66.50	Transaction cuts
6-16-08	HB 14	-235	2889	2920	-326.75	-229.21	97.54	148.12	TSA
7-3-08	HB 15	520	2980	3080	-316.04	-272.85	43.19	145.50	TSA; Transaction cuts
5-18-08	HB 7	-502	2217	2181	-304.19	-300.23	3.96	23.53	Facility derate
1-30-08	HB 10	116	2307	2435	-302.51	-244.00	58.51	79.10	RTS ramping spikes
8-15-08	HB 17	662	3400	3426	-300.23	-242.83	57.40	74.46	TSA

* Imports into NYISO are positive.

OH Top 10 Positive Spreads

NYISO-OH									
Positive Price Spread – Uneconomic NYISO Exports									
		OH	Total NYCA		NY-OH	Real-Time Prices			
Date	Hour	Actual* Imports	Actual* Imports	RTC* Imports	Price Difference	New York OH Proxy	OH	PJM NY Proxy	Notes
10-08-07	HB 18	441	1140	1240	\$269.99	\$353.10	\$83.11	\$109.20	Load forecast error
	HB 19	405	1506	1272	\$1031.41	\$1117.96	\$86.55	\$187.30	
2-11-08	HB 20	609	2971	3180	\$229.2	\$323.56	\$94.36	\$108.19	290 MW transaction cuts & unit trip
2-27-08	HB 18	-401	3290	3540	\$229.19	\$304.68	\$75.49	\$185.14	250 MW transaction cuts
12-13-07	HB 17	1204	941	1427	\$218.14	\$317.45	\$99.31	\$186.45	487 MW transaction cuts
10-04-07	HB 16	316	1015	1271	\$216.81	\$308.69	\$91.88	\$137.58	456 MW transaction cuts & major unit forced off-line
01-02-08	HB 17	525	3198	3248	\$213.11	\$299.67	\$86.56	\$149.87	Load forecast error
02-02-08	HB 12	424	3319	3669	\$207.52	\$254.72	\$47.20	\$85.38	350 MW transaction cuts; Large unit derate
05-30-08	HB 20	-643	2620	2679	\$192.15	\$228.52	\$36.37	\$55.43	Unscheduled unit derates
03-31-08	HB 9	-13	2614	2814	\$189.56	\$271.56	\$82.00	\$142.84	200 MW transaction cuts; Unscheduled unit derates

* Imports into NYISO are positive.

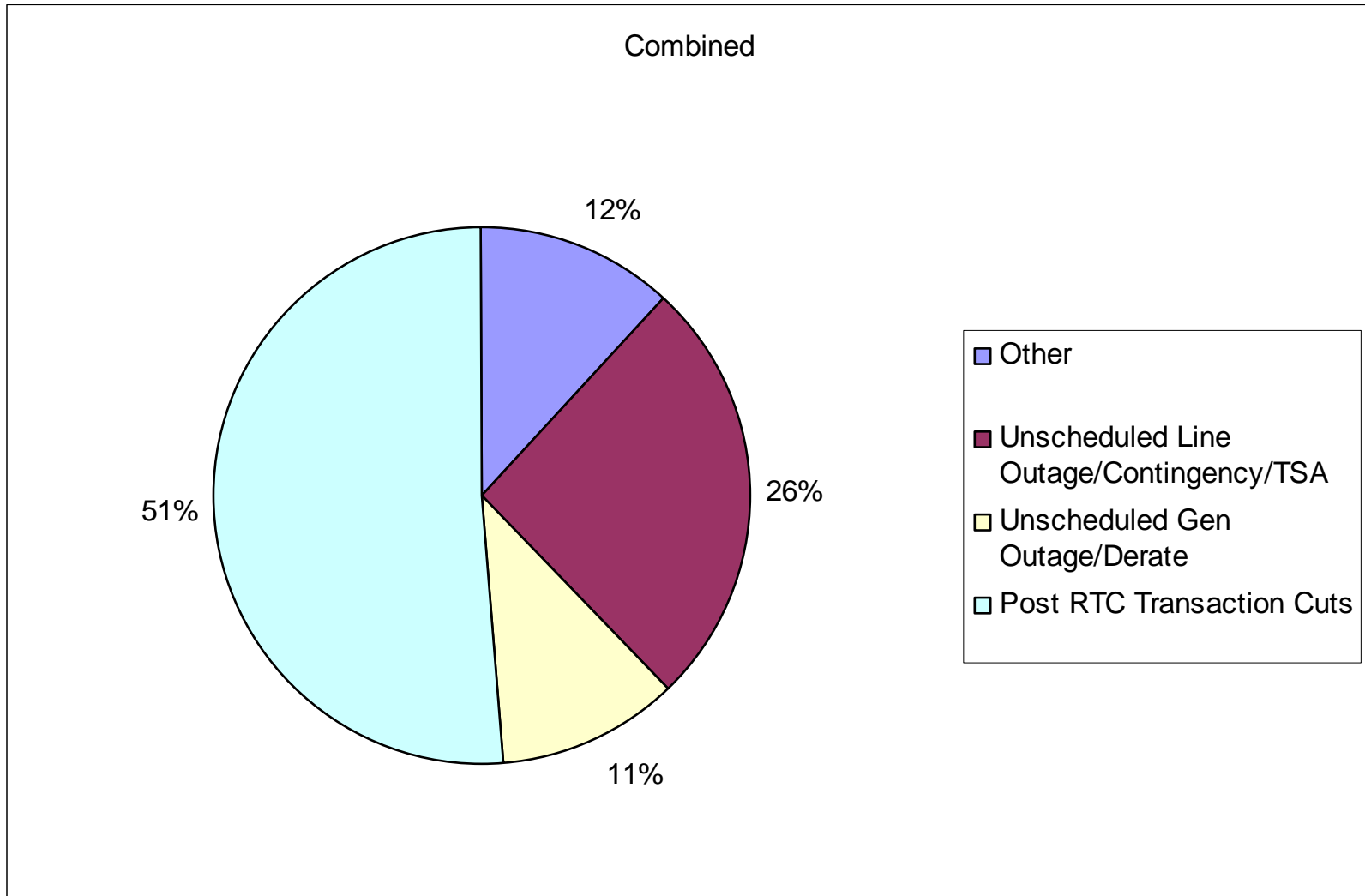
Internal RTC-RTD Divergence Analysis – Zone J

RTC – RTD Causes of Divergence

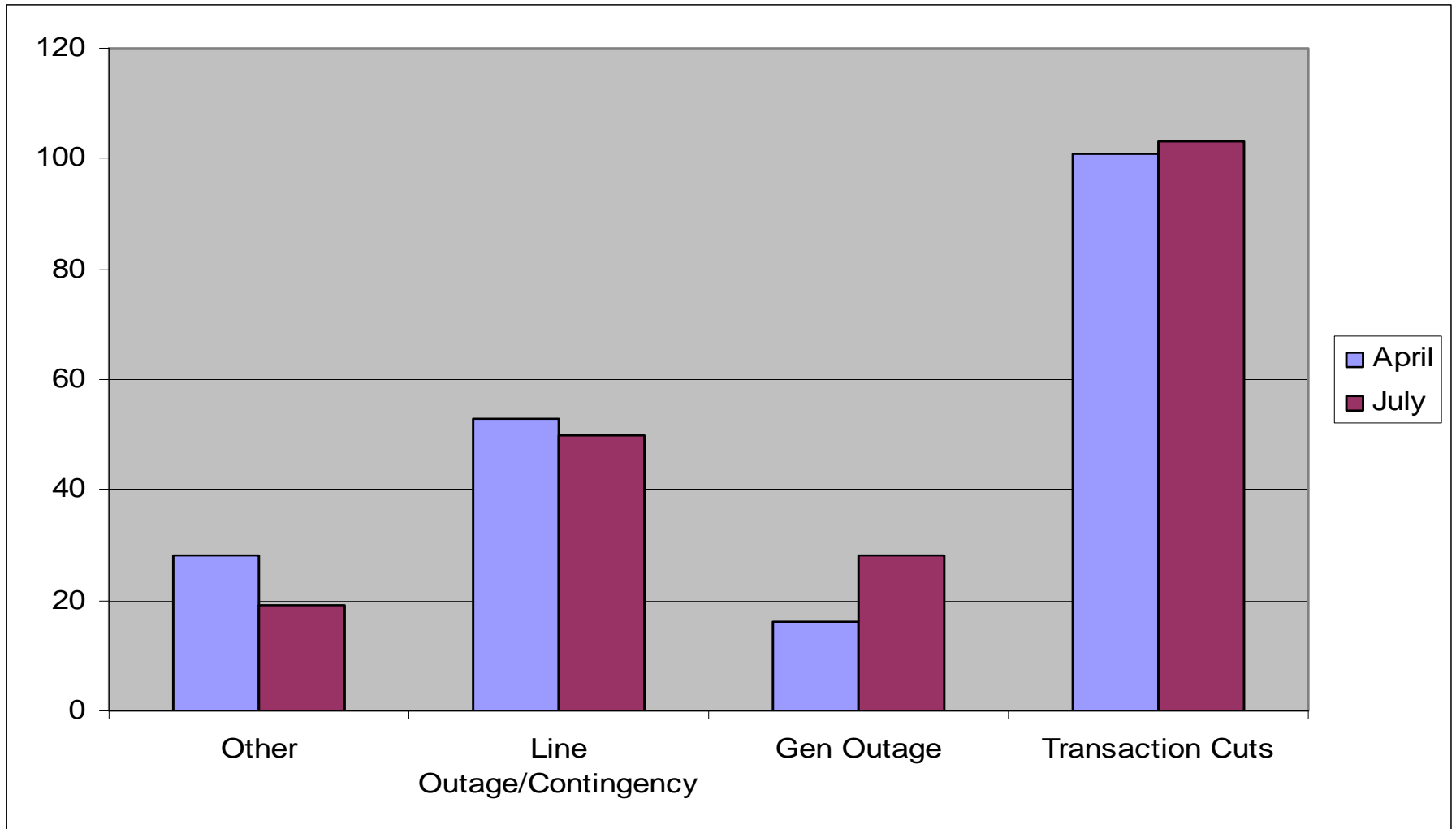
- ◆ Analysis was done for hours where RTC's* forecasted prices for the hour were significantly different than RTD's integrated hourly price for Zone J.
 - *The top 200 hours of absolute divergence for April 2008 and the top 200 hours of absolute divergence for July 2008 were analyzed.*
 - *These hours were categorized into four categories of divergence*
 - Post RTC Transaction Cuts by control areas other than NY
 - Unscheduled Gen Outage/Derate
 - Unscheduled Line Outage/Contingency/TSA
 - Other (Load forecast error, PAR control differences, etc)

**RTC prices are from the RTC which initializes 60 minutes prior to the start of the hour and posts 45 minutes prior to the start of the hour; the RTC which schedules transactions.*

Causes of Divergence RTC-RTD Combined April & July 2008



Causes of Divergence RTC-RTD April & July 2008 Breakdown



Causation Category Statistics

(for top 200 hours of absolute divergence for April & for July 2008)

	Other	Unscheduled Line Outage/Contingency /TSA	Unscheduled Gen Outage/Derate	Post RTC Transaction Cuts
Average Delta	\$5.70	(\$43.87)	(\$34.79)	(\$22.89)
Range	(-\$92,\$70)	(-\$873,\$174)	(-\$153,\$46)	(-\$433,\$165)

Information on Transaction Cuts

- ◆ The following data covers analysis for the same two months we have been discussing, April and July 2008:
 - *72% of all hours have Post RTC Transaction Cuts from all control areas.*
 - *NYISO cuts account for only 10% of all transaction cuts.*

Evaluation of Reducing 75 Minute Bid Lockout

75 Minute Bid Lockout

- ◆ Currently, all bids are locked in the RTS software 75 minutes prior to the start of the hour.
- ◆ There are two main reasons for this restriction:
 - *The scheduling of transactions for the next hour*
 - *The commitment of 30 minute gas turbine resources for that upcoming hour.*

75 Minute Timeline

- ◆ 12:45 - All bids are locked for HB 14.
- ◆ 13:00 – RTC (T-60) closes and begins to process.
- ◆ 13:15 – RTC (T-60) posts, with a first time period/base point for 13:30. This RTC schedules transactions for HB 14.
- ◆ 13:15 – RTC (T-45) closes and begins to process.
- ◆ 13:30 – RTC (T-45) posts, with a first time period/base point for 13:45. This is the last RTC which can commit 30 minute GTs for the beginning of HB 14.
- ◆ 13:30 – RTC (T-30) closes and begins to process.
- ◆ 13:45 – RTC (T-30) posts, with a first time period/base point for 14:00. This is the last RTC which can commit 10 minute GTs for the beginning of HB 14.

What Would Reducing the 75 Minute Window Accomplish?

◆ Risks:

- *As the previous slide indicates if bids were to be modified after the T-45 RTC, 30 minute gas turbines would be evaluated for commitment on an unsecure bid set.*
 - This could negatively impact economic efficiency (increased uplift, price suppression, price volatility, inefficient use of environmental credits) and system reliability (over commitment of resources, under commitment of resources, shortages of 10 minute reserves).

◆ Benefits:

- *Market participants have indicated that this reduction would permit cheaper resources to be scheduled.*
- *NYISO software commits and dispatches to the lowest cost solution.*
 - What costs change for resources between T-75 and T-30?
 - What new costs would resources reflect into their bids between RTCs?

Conclusion on Reducing 75 Minute Lockout

- ◆ The NYISO is currently unaware of any demonstrable benefit to the marketplace by reducing the 75 minute bid lock window.
- ◆ Although, the NYISO has sought participant feedback on potential marketplace benefits of this change, we have yet to receive detailed information identifying unrepresented variable costs.
- ◆ Given the lack of apparent benefit and the potential for significant risk to economic efficiency and system reliability, the NYISO currently does not endorse reducing the 75 minute bid lockout window.

Next Steps

Where to Go

- ◆ Further identify causes of deviation in order to outline potential solutions to these causes.
 - *Including a comparison of RTC-RTD divergence to DA-RT divergence.*
- ◆ Multiple projects are currently underway to address the causes of differences outlined in this presentation.
 - *Load forecasting improvements to RTC (Software Ready in 4thQ 2009)*
 - *Scheduling and Pricing Phase 3 - Addressing top of the hour price volatility caused by ramp constraints. (4thQ 2009 Design Commitment)*
 - *Enhanced Scheduling with PJM. (4thQ 2009 Design Commitment)*
 - *Enhanced Scheduling with ISONE (2nd Q 2009 Implementation/Approval of Procedure)*
- ◆ Feedback on methods to further reduce divergences is welcome.

The New York Independent System Operator (NYISO) is a not-for-profit corporation that began operations in 1999. The NYISO operates New York's bulk electricity grid, administers the state's wholesale electricity markets, and provides comprehensive reliability planning for the state's bulk electricity system.

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