Price Reservations and Corrections

Billing and Price Correction Task Force
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Outline

- Update on the Real Time price reservation and price correction statistics

- Impact of price corrections

  – February-July 2005

  – Impact by type of correction

  – Frequency of larger price corrections

- Examples of price corrections

Update

Update

- ## New software issue identified

  There is an issue that infrequently arises in the NYISO's Real-Time Dispatch software relating to generator unit operating status that can result pricing errors. A fix is expected to be deployed next week.
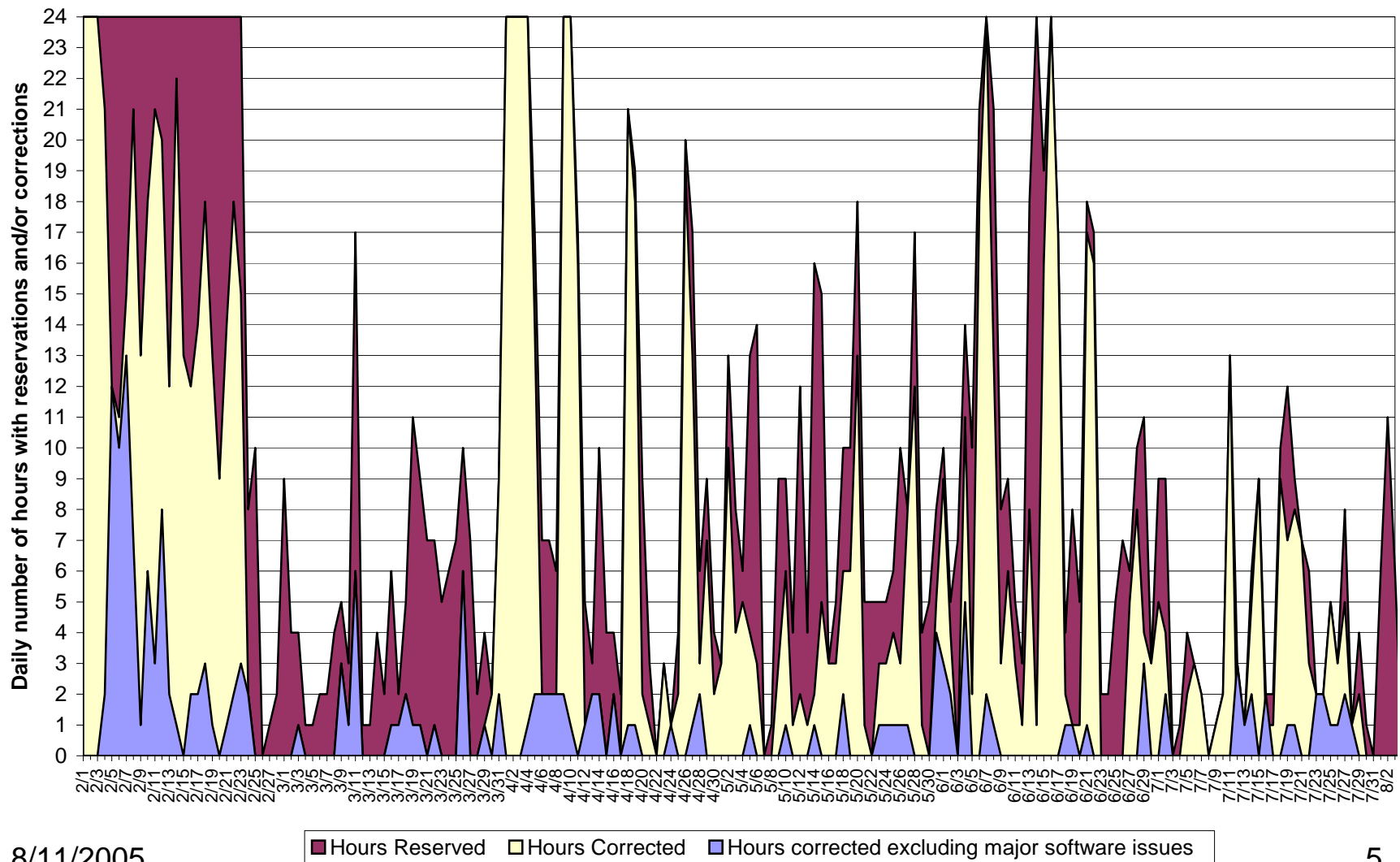
- ## Updated chart on price corrections excluding major software issues

  - Hours reserved.
  - Hours corrected.
  - Hours corrected excluding major software issues.

Daily Hours with Corrections Excluding Major Known Software Issues
February 1 2005- August 3 2005
(Corrections through July 31 only)

2005 Percentage of Hours Corrected (Real Time)

Month	Percent of Hours corrected	Percent of Hours with Corrections excluding major software issues
February	57%	12%
March	5%	4%
April	39%	3%
May	16%	2%
June	30%	3%
July	14%	3%

2004 Percentage of Hours Corrected (Real Time)

- The following is extracted from 4-R in the NYISO Monthly Report.

|			
January	8%	July	7%
February	3%	August	6%
March	5%	September	3%
April	4%	October	5%
May	8%	November	2%
June	8%	December	4%
		All 2004	5%

Impact of Price Corrections

Impact of Price Corrections February 2005-July 2005

- PTID Price Intervals:
  - In an hour of the Real time market, there are (approximately)
    - 420 PTIDs
    - 12 intervals
  - So there are 420*12=5,040 PTID Price Intervals in the hour.
  - In a day, there are 24*5,040=120,960 PTID Price intervals.
  - In July there are 31*120,960=3,749,760 PTID Price intervals.
- We have corrected an average of 4.41% of PTID Price Intervals.
- Price correction statistics in hours and PTID Price Intervals (including all correction reasons)

	Hours	PTID Price Intervals
Feb	57%	21.94%
March	5%	1.02%
April	39%	0.47%
May	16%	0.72%
June	30%	1.07%
July	14%	2.72%

PTID Intervals

4.41%

95.59%
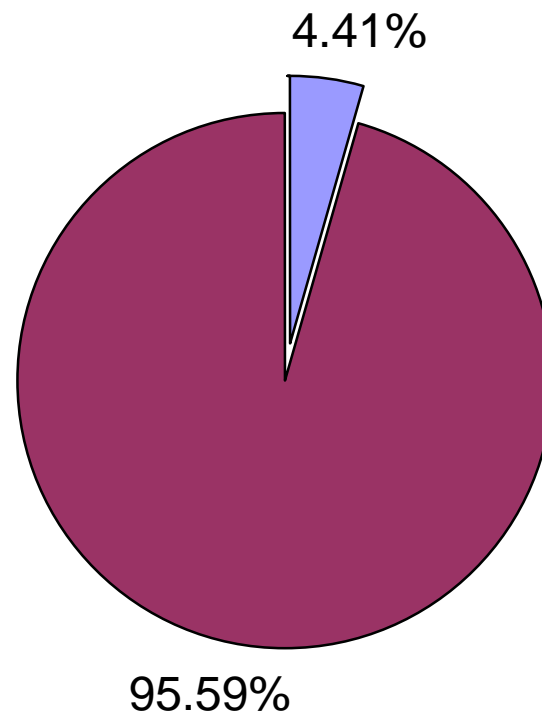
☐ Percent of PTID Price Intervals corrected

☐ Percent of all PTID Price Intervals where LBMPs were not corrected

Impact of Price Corrections February 2005-July 2005

- Price correction statistics in hours and PTID Price Intervals <u>excluding software issues</u>.

Month	Hours	PTID Price Intervals
March	4%	1.01%
April	3%	0.33%
May	2%	0.51%

Impact of Price Corrections February 2005-July 2005

- Selected all intervals with at least one PTID Price Interval corrected.
- Looked at the impact of the price corrections on all PTID Price Intervals in those intervals.
  - The distribution of price changes is both very tall (and narrow) at zero and has long tails
  - The median PTID Price Interval price change is $0
  - The average PTID Price Interval change decreased prices by $6.73.
    (approximately $0.56 on an hourly basis assuming one interval changed)
  - More about the data
    - Over 70% of PTID Price Intervals have a $0 price change (we are still looking at the set of intervals when there was at least one price change).
      $$X – C – X – X – X – C – C – X – X – X$$
    - 58% of intervals with changes only have one PTID Price Interval affected.
      - If we correct prices only in a load pocket all PTIDs outside that load pocket would have a $0 price change, and,
      - Specific software issues can lead to correcting just a few PTIDs :
        - » Isolated generator bus issue
        - » The DNI issue

Impact of Price Corrections by Type of Correction (Broad Categories)

- Uses the same categories as the 7/29 Taskforce presentation.
- A positive delta indicates an increase in the price while a negative delta indicates a decrease in the price after correction.

    Price delta = Corrected LBMP - Original LBMP

- The following statistics are based on *March-May data only.*

Reasons for Price Corrections (updated for July)

Number of **days with corrections** by correction reason
(general categories)

Type of correction	Feb	Mar	Apr	May	Jun	Jul*	Total
Bad input data	4	7	4	2	0	6	23
Process Failure/Missing Data/System Outage	5	5	6	5	2	0	23
Modeling	7	0	0	0	0	0	7
Operational	1	2	5	0	2	1	11
Software	24	3	22	27	24	21	121
Unexplainable model solution/Non Convergence	1	0	1	9	7	1	19
Total Days with Corrections	24	14	28	27	25	25	143

*preliminary

Statistics on the the price delta by type of correction

Type of Correction	Mean	Median	Std Dev	Min	Max
Bad input data	(123.19)	0.00	495.10	(1,553.50)	2,259.45
Process Failure/Missing Data/System Outage	(586.15)	(29.30)	833.84	(3,841.39)	1,616.67
Modeling	n/a	n/a	n/a	n/a	n/a
Operational	137.85	0.00	825.97	(5,227.25)	7,511.04
Software	0.22	0.00	32.58	(1,068.72)	1,809.22
Unexplainable model solution/Non convergence	(749.34)	1,155.26	3,392.33	(6,172.91)	2,729.59

Note: there were no prices corrected for Modeling issues in the months that were coded (March - May 2005.)

Frequency of Larger Price Corrections

How often are price corrections more than $25 (up or down)?

Percent of all PTID Price Intervals where LBMPs changed by more than $25 (up or down)	0.24%
Percent of all PTID Price Intervals where LBMPs were not corrected or changed by less than $25 (up or down)	99.76%

Frequency of Larger Price Corrections

How often are price corrections more than $50 (up or down)?

Percent all PTID Price Intervals where LBMPs changed by more than $50 (up or down)	0.17%
Percent of all PTID Price Intervals where LBMPs were not corrected or changed by less than $50 (up or down)	99.83%

Frequency of Larger Price Corrections

How often are price corrections more than $100 (up or down)?

Percent of corrected PTID Price Intervals where LBMPs changed by more than $100 (up or down)	0.12%
Percent of all PTID Price Intervals where LBMPs were not corrected or changed by less than $100 (up or down)	99.88%

Do larger price corrections increase or decrease prices?

	Where a price correction resulted in an increase in price of $25 or more	Where a price correction resulted in an increase in price of $50 or more	Where a price correction resulted in an increase in price of $100 or more
Percent of all PTID Price Intervals	0.11%	0.07%	0.04%

	Where a price correction resulted in a decrease in price of $25 or more	Where a price correction resulted in a decrease in price of $50 or more	Where a price correction resulted in a decrease in price of $100 or more
Percent of all PTID Price Intervals	0.13%	0.10%	0.07%

Price Correction Examples

Bad Input Data

- A unit's meter shows it to have tripped and as having a 0MW output but the next interval the unit is back on at 350MW.

Original Zonal LBMPs

TIME (EST)	WEST	HUD VL	NYC	LONGIL
3/10/2005 14:10	50.47	59.63	84.42	79.32
3/10/2005 14:15	51.02	60.08	78.79	79.38
3/10/2005 14:20	56.28	66.76	635.66	68.35
3/10/2005 14:25	47.59	55.70	57.54	67.84
3/10/2005 14:30	51.23	60.08	62.12	67.88
3/10/2005 14:35	51.29	60.03	65.64	67.42

Corrected Zonal LBMPs

Time Stamp	WEST	HUD VL	N.Y.C.	LONGIL
3/10/2005 14:10	50.47	59.63	84.42	79.32
3/10/2005 14:15	51.02	60.08	78.79	79.38
3/10/2005 14:20	49.31	57.90	68.17	73.62
3/10/2005 14:25	47.59	55.70	57.54	67.84
3/10/2005 14:30	51.23	60.08	62.12	67.88
3/10/2005 14:35	51.29	60.03	65.64	67.42

Price Change (Corrected LBMP-Origina LBMP)

Time Stamp	WEST	HUD VL	N.Y.C.	LONGIL
3/10/2005 14:10	0.00	0.00	0.00	0.00
3/10/2005 14:15	0.00	0.00	0.00	0.00
3/10/2005 14:20	-6.97	-8.86	-567.49	5.27
3/10/2005 14:25	0.00	0.00	0.00	0.00
3/10/2005 14:30	0.00	0.00	0.00	0.00
3/10/2005 14:35	0.00	0.00	0.00	0.00

Process Failure/ Missing Data/ System Outage

- ## March 26, HB 16-22:

  - Total failure of the EMS systems from 16:10

  - 16:15 prices still OK

  - Used SCUC prices as replacements.

  - Replaced RTC internal prices from 16:45 through 22:15 posted RTC times with SCUC prices

March 26: Price correction due to a Process Failure/ Missing Data/ System Outage
Original and Corrected Prices for NYC
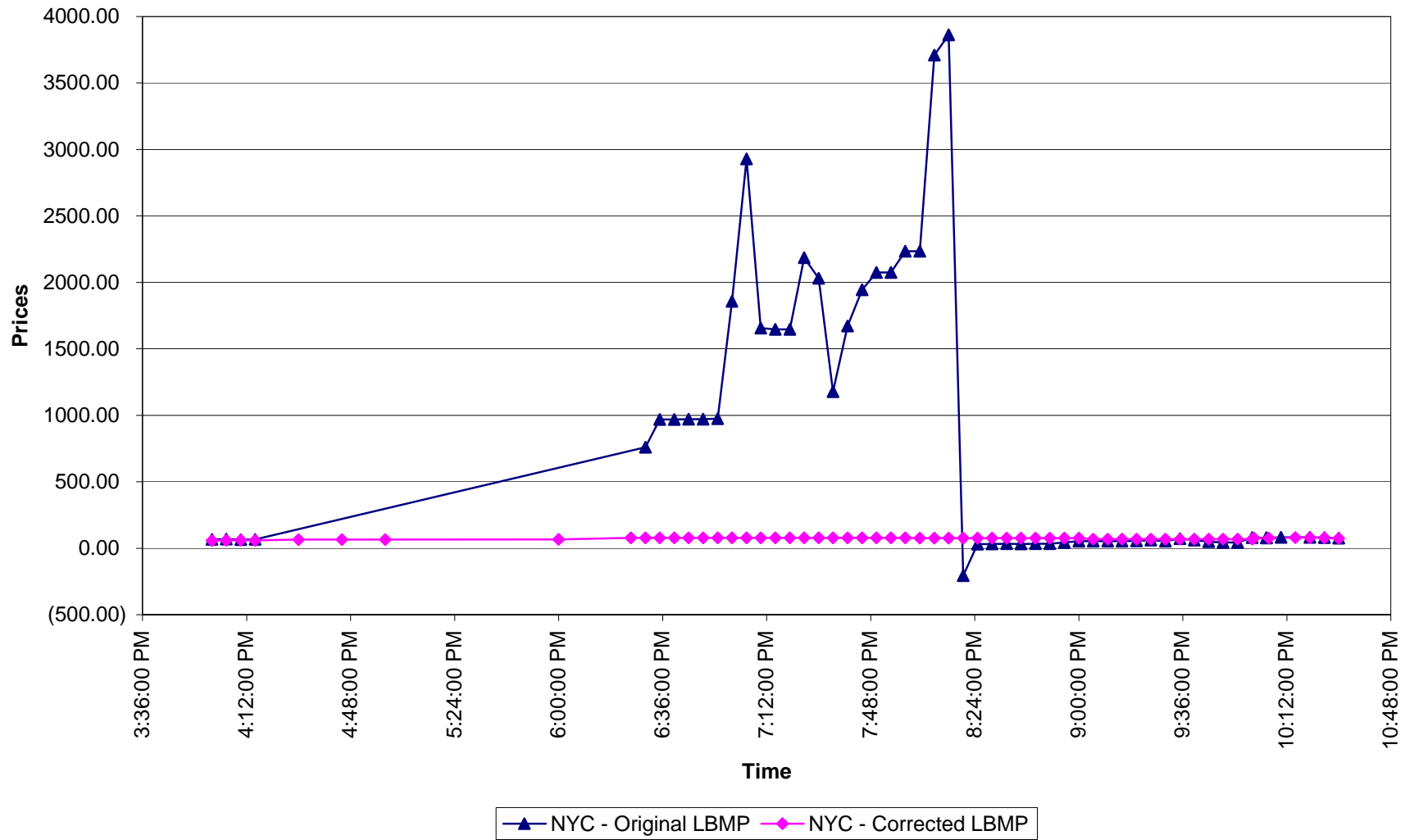
Operational Issue

– The external bus prices at Ontario (O.H. Gen Bruce) were corrected in RTC and RTD for HB 14 because a TLR and the subsequent derating of HAM and DAM transactions created congestion between OH-NY in RTC that should not have existed. These incorrect prices then flowed into RTD. The OH congestion was removed form the RTC prices and the RTD prices were corrected by ensuring that they were not overwritten by RTC during the posting process.

Time	Name	PTID	Original LBMP	Corrected LBMP	Difference (Corrected LBMP minus Original LBMP)
4/24/2005 13:55	O.H._GEN_BRUCE	24063	56.47	56.47	0
4/24/2005 14:00	O.H._GEN_BRUCE	24063	57.87	57.87	0
4/24/2005 14:05	O.H._GEN_BRUCE	24063	-999.7	58.04	1057.74
4/24/2005 14:10	O.H._GEN_BRUCE	24063	-999.7	58.69	1058.39
4/24/2005 14:15	O.H._GEN_BRUCE	24063	-999.7	58.1	1057.8
4/24/2005 14:20	O.H._GEN_BRUCE	24063	-999.7	58.1	1057.8
4/24/2005 14:25	O.H._GEN_BRUCE	24063	-999.7	57.57	1057.27
4/24/2005 14:30	O.H._GEN_BRUCE	24063	-999.7	60.13	1059.83
4/24/2005 14:35	O.H._GEN_BRUCE	24063	-999.7	58.01	1057.71
4/24/2005 14:40	O.H._GEN_BRUCE	24063	-999.7	56.76	1056.46
4/24/2005 14:45	O.H._GEN_BRUCE	24063	-999.7	52.26	1051.96
4/24/2005 14:50	O.H._GEN_BRUCE	24063	-999.7	42.05	1041.75
4/24/2005 14:55	O.H._GEN_BRUCE	24063	-999.7	42.09	1041.79
4/24/2005 15:00	O.H._GEN_BRUCE	24063	-999.7	42.09	1041.79
4/24/2005 15:05	O.H._GEN_BRUCE	24063	35.04	35.04	0
4/24/2005 15:10	O.H._GEN_BRUCE	24063	38.04	38.04	0

Questions?