Congestion Impact Calculation Update

NYISO ESPWG
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8/08/04

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Congestion Reporting

- Congestion Impact Metrics Defined
- 2003
  - Data Sufficient for Constrained-Unconstrained Calculation Available for All Hours
  - “PROBE Lite” Calculation without Network Models
  - 2003 Congestion Previously Reported
- 2004
  - Hourly Market and Network Model Available for All Hours (1/1 – 6/30)
  - Monthly Congestion Report
  - PROBE Available for Sensitivity and “What If” Analysis

Congestion Impact Reporting

- Annual Total or Year-to-Date
- Monthly Totals

	Report By			
	NY Total	**Zones**	**Monitored Element**	**Contingency**
Generation & Import Bid Production Cost	✓	✓	No	No
Total Load Payment	✓	✓		
Load Congestion Payments TCC Hedge	✓	✓		
Net Load Payments Due to Congestion	✓	✓		
Total Load Congestion Payments	✓	✓	✓	
Load Congestion Payments TCC Hedge	✓	✓	✓	
TCC Unhedged Load Congestion Payments	✓	✓	✓	
Total Generation & Import Payment	✓	✓		

2004 Q1 New York Congestion

All Calculations Are Constrained – Unconstrained Values

2004 Congestion Impact Metrics

1.1 Bid Production Cost Impact ($ Millions)	Jan	Feb	Mar	Q1 Total
New York	$24	$11	$7	$42
Imports	-$7	-$8	-$5	-$20
Total	**$17**	**$3**	**$2**	**$22**

+ Number Means Congestion Increased the Supply Production Cost

1.2 Congestion Payments Impact ($ Millions)	Jan	Feb	Mar	Q1 Total
Total Congestion Payments	$156	$53	$38	$247
TCC Hedge	$103	$39	$31	$173
Total Unhedged Congestion Payments	**$53**	**$14**	**$7**	**$74**

+ Number Means the Congestion Component of LMP Increased Due to Congestion

1.3 Load Payments Impact ($ Millions)	Jan	Feb	Mar	Q1 Total
Total Load Payments	$86	$34	-$12	$108
Hedge	$103	$39	$31	$173
Total Unhedged Load Payments	**-$17**	**-$6**	**-$43**	**-$65**

+ Number Means Congestion Caused Load Payments to Increase

A Negative Number Means Unhedged Load Payments Went Down Due to Congestion

1.4 Generation Payments Impact ($ Millions) Total Generation Payments	Jan	Feb	Mar	Q1 Total
New York	-$1	$4	-$42	-$39
Imports	-$16	-$9	-$1	-$26
Total	**-$17**	**-$6**	**-$43**	**-$65**

A Negative Number Means Congestion Decreased Payments to Generators

2004 Q1 New York Congestion

All Calculations Are Constrained – Unconstrained Values

Bid Production Cost Impact

		Jan	Feb	Mar	Q1 Total
A	WEST	-$2	-$1	$0	-$4
B	GENESE	$0	$0	$0	$0
C	MHKVL	-$7	-$3	-$3	-$12
D	NORTH	$0	$0	$0	$0
E	CENTRL	-$1	$0	$0	-$1
F	CAPITL	-$2	-$1	$0	-$2
G	HUDVL	-$3	-$2	$0	-$5
H	MILLWD	$0	$0	$0	$0
I	DUNWOD	$0	$0	$0	$0
J	N.Y.C.	$34	$14	$8	$56
K	LONGIL	$4	$5	$3	$11
	New York	**$24**	**$11**	**$7**	**$42**
N	NPX	$0	-$1	$0	-$1
O	OH	-$1	-$1	-$1	-$2
P	PJM	-$7	-$4	-$3	-$14
Q	HQ	$1	-$3	-$2	-$3
	Imports	**-$7**	**-$8**	**-$5**	**-$20**
	Total	**$17**	**$3**	**$2**	**$22**

+ Number Means Congestion Increases Supplier Production Cost

Societal Impact

The SCUC Minimization Objective

2004 Q1 New York Unhedged Congestion Payments

All Calculations Are Constrained – Unconstrained Values

Accounting Impact

LMP, Congestion Component Change ONLY

Congestion Payments Impact ($ Millions)

		Jan	Feb	Mar	Q1 Total
A	WEST	$0	$0	$0	$0
B	GENESE	$0	$0	$0	$0
C	MHKVL	$0	$0	$0	$0
D	NORTH	$0	$0	$0	$0
E	CENTRL	$0	$0	$0	$0
F	CAPITL	$0	$0	$0	$0
G	HUDVL	$0	$0	$0	$0
H	MILLWD	$0	$0	$0	-$1
I	DUNWOD	$0	$0	$0	$0
J	N.Y.C.	$41	$7	$3	$51
K	LONGIL	$12	$7	$5	$23
	New York	**$51.3**	**$13.8**	**$6.7**	**$72**
N	NPX	$1	$0	$0	$1
O	OH	$1	$0	$0	$1
P	PJM	$0	$0	$0	$0
Q	HQ	$0	$0	$0	$0
	Imports	**$1.9**	**$0.3**	**$0.3**	**$3**
	Total	**$53.2**	**$14.1**	**$7.0**	**$74**

+ Number Means Congestion Increases Load Cost

2004 Q1 New York Unhedged Congestion Load Impact

All Calculations Are Constrained – Unconstrained Values

Bills Impact

Energy, Losses, & Congestion Components Change

Load Payments Impact ($ Millions)

		Jan	Feb	Mar	Q1 Total
A	WEST	-$17	-$6	-$8	-$31
B	GENESE	-$4	-$1	-$4	-$9
C	MHKVL	-$25	-$10	-$9	-$43
D	NORTH	-$4	-$2	-$2	-$8
E	CENTRL	-$2	-$1	-$2	-$6
F	CAPITL	-$7	-$2	-$4	-$13
G	HUDVL	-$15	-$7	-$5	-$27
H	MILLWD	$0	$0	-$3	-$3
I	DUNWOD	-$9	-$3	-$3	-$15
J	N.Y.C.	$63	$21	-$3	$80
K	LONGIL	$4	$6	$0	$10
Total		**-$16.7**	**-$5.7**	**-$42.9**	**-$65**

+ Number Means Congestion Increases Load Payments

2004 Q1 New York Unhedged Congestion Supply Impact

All Calculations Are Constrained – Unconstrained Values

Generation Payments Impact ($ Millions)

		Jan	Feb	Mar	Q1 Total
A	WEST	-$15	-$5	-$8	-$27
B	GENESE	-$3	-$1	-$4	-$8
C	MHKVL	-$23	-$8	-$9	-$39
D	NORTH	-$3	-$1	-$2	-$7
E	CENTRL	-$2	-$1	-$2	-$5
F	CAPITL	-$6	-$2	-$4	-$11
G	HUDVL	-$14	-$6	-$5	-$24
H	MILLWD	-$8	-$3	-$3	-$13
I	DUNWOD	$0	$0	-$3	-$3
J	N.Y.C.	$66	$23	-$3	$86
K	LONGIL	$5	$7	$0	$13
	New York	**-$1.2**	**$3.7**	**-$41.5**	**-$39**
N	NPX	$0	-$1	$0	-$1
O	OH	-$3	-$1	-$2	-$6
P	PJM	-$10	-$5	-$3	-$18
Q	HQ	-$2	-$3	$3	-$1
	Imports	**-$15.6**	**-$9.4**	**-$1.4**	**-$26**
	Total	**-$16.7**	**-$5.7**	**-$42.9**	**-$65**

Payments Impact

Energy, Losses, & Congestion Components Change

+ Number Means Gen Payments Went Up Due to Congestion

2004 New York Congestion
Load & Congestion Payments by Constraint

2004 Monthly Congestion
% of Monthly Unhedged Congestion (if>5% of Monthly Total)

Monitored Facility	Jan	Feb	Mar	Apr	May	Jun	Q1+Q2 Total Unhedged Congestion Impact	Q1+Q2 %
RAINEY__ 345 DUNWODIE 345	73%	51%	8%			9%	$49	36%
DUNWODIE 345 SHORE_RD 345 1	20%	39%	37%	19%	24%	30%	$37	27%
RAINEY__ 138 VERNON__ 138 1					22%	22%	$12	9%
CENTRAL EAST - VC			16%	47%	13%	7%	$10	7%
PLSNTVLY 345 LEEDS___ 345					17%	14%	$9	6%
SHORE_RD 345 SHORE_RD 138 1			5%		14%		$4	3%
FRESHKLS 138 WILLWBRK 138 1			7%				$2	1%
SPR/DUN-SOUTH			8%	9%			$1	1%
E179RE55 138 HELLTP55 138 1			10%				$1	1%
MILLWOOD 345 EASTVIEW 345 1			9%				$1	1%

Why Not All of Quarter 1 and 2 ?

- All But Congestion Payments Metric Calculation is Affected by Mitigation Assumption for the Unconstrained Case
- 2003 Results Assume Mitigated Bids in Constrained and Unconstrained Case
- 2003 Mitigation Provided by SCUC
- NY Mitigation Changed in May 2004
  - New Procedure More Sensitive to Transmission Limits
- Options to Handle New Mitigation Scheme
  1. Use SCUC Provided Mitigation for Unconstrained Case
  2. Calculate Mitigated Bids According to NYISO Procedures
  3. Change to Unmitigated Bids

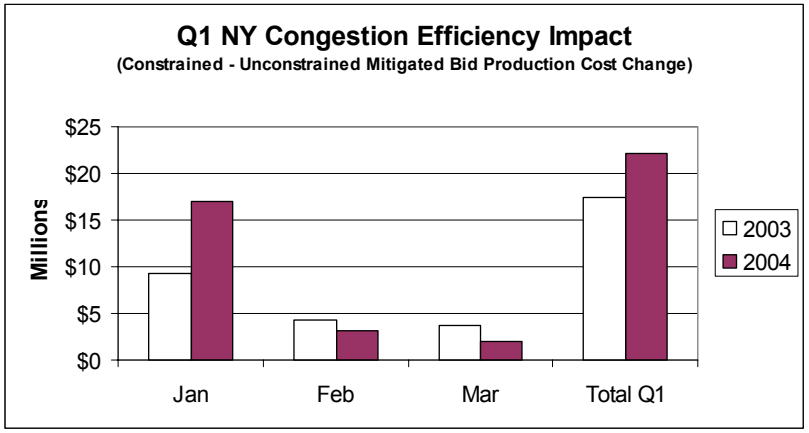
– Recommend Option 1 for Year to Year General Metric Comparison
– Consider Option 2 for “What If” Studies

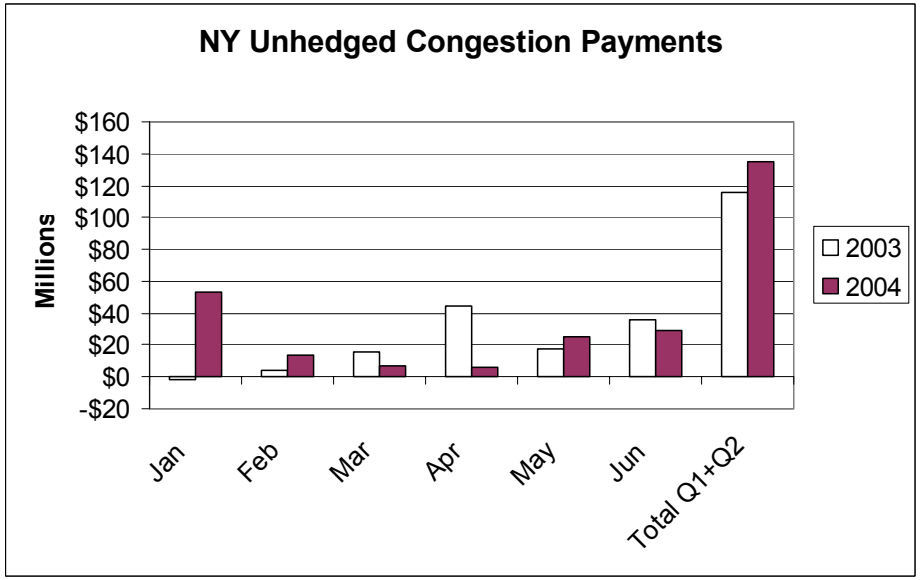
PROBE vs. PROBE Lite

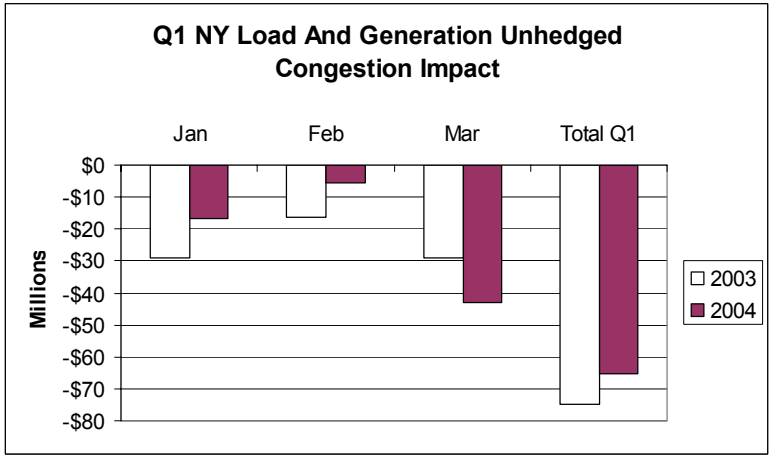
- Metrics Have Been Calculated With PROBE Lite
  - PROBE Lite Assures Constrained Results Accuracy
  - Comparability to 2003 Suggests Using PROBE Lite for Now
  - Comparison to PROBE Simulator Would be Useful

- "What If" and Sensitivity Studies Require PROBE

2004 vs. 2003


Q1 NY Congestion Efficiency Impact
(Constrained - Unconstrained Mitigated Bid Production Cost Change)
Millions
$25
$20
$15
$10
$5
$0
Jan
Feb
Mar
Total Q1
2003
2004


NY Unhedged Congestion Payments
Millions
$160
$140
$120
$100
$80
$60
$40
$20
$0
-$20
Jan
Feb
Mar
Apr
May
Jun
Total Q1+Q2
2003
2004


Q1 NY Load And Generation Unhedged Congestion Impact
Jan
Feb
Mar
Total Q1
Millions
$0
-$10
-$20
-$30
-$40
-$50
-$60
-$70
-$80
2003
2004

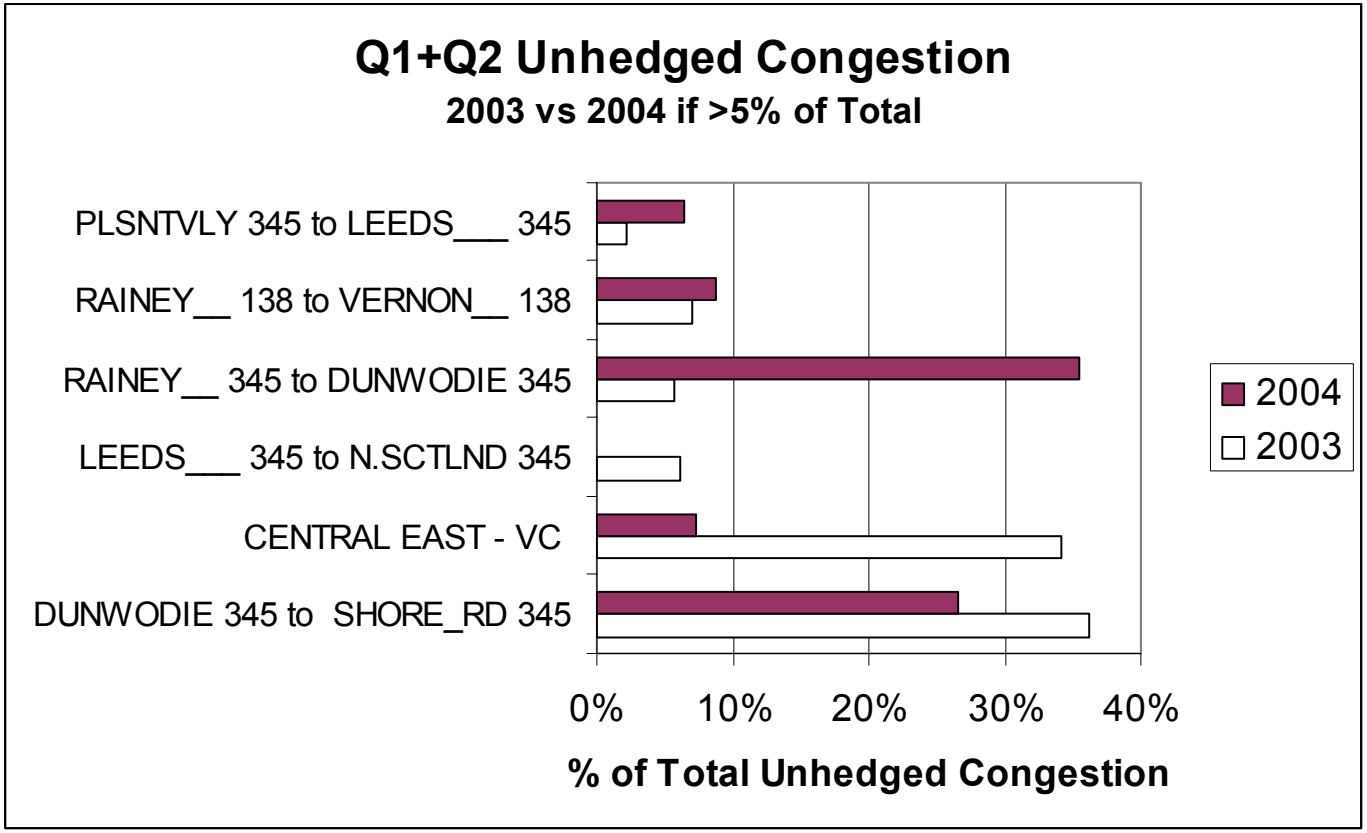
2003 New York Congestion
Load & Congestion Payments by Constraint

2003 Monthly Congestion

% of Monthly Unhedged Congestion (if>5% of Monthly Total)

Monitored Facility	Jan	Feb	Mar	Apr	May	Jun		Q1+Q2 Total	%
DUNWODIE 345 SHORE_RD 345 1	83%	55%	65%		76%	27%		$48	36%
CENTRAL EAST - VC	11%	5%	18%	80%		13%		$46	34%
LEEDS___ 345 N.SCTLND 345 1						21%		$8	6%
RAINEY__ 345 DUNWODIE 345		27%			5%	5%		$8	6%
RAINEY__ 138 VERNON__ 138 1						21%		$9	7%
UPNY CONED				13%				$7	5%
VALLYSTR 138 EGRDNCTY 138 1								$1	1%
E179THST 138 HELLGT_E 138 1								$1	1%
PLSNTVLY 345 LEEDS___ 345 1						7%		$3	2%
W49TH_ST 345 SPRNBRK_ 345		7%	5%					-$3	

Monitored Facility	Jul	Aug	Sep	Oct	Nov	Dec		Annual Total Unhedged Congestion Impact	Annual %
DUNWODIE 345 SHORE_RD 345 1	25%	22%	37%	17%	23%	43%		$97	31%
CENTRAL EAST - VC	15%	13%		30%	15%			$69	22%
LEEDS___ 345 N.SCTLND 345 1	36%	10%						$39	12%
RAINEY__ 345 DUNWODIE 345	5%	13%	23%	12%	45%	52%		$39	12%
RAINEY__ 138 VERNON__ 138 1	12%	27%	19%					$38	12%
UPNY CONED		9%						$13	4%
VALLYSTR 138 EGRDNCTY 138 1			6%	11%				$5	2%
E179THST 138 HELLGT_E 138 1			10%	6%				$3	1%
PLSNTVLY 345 LEEDS___ 345 1								$3	1%
W49TH_ST 345 SPRNBRK_ 345				14%	6%			$2	1%


Q1+Q2 Unhedged Congestion
2003 vs 2004 if >5% of Total
PLSNTVLY 345 to LEEDS___ 345
RAINEY__ 138 to VERNON__ 138
RAINEY__ 345 to DUNWODIE 345
LEEDS___ 345 to N.SCTLND 345
CENTRAL EAST - VC
DUNWODIE 345 to SHORE_RD 345
2004
2003
0%
10%
20%
30%
40%
% of Total Unhedged Congestion

Observations

- 2004 Metrics Following Close to 2003 Pattern
- Dunwoodie – Rainey 345 kV Cables Congestion High in Jan ‘04
- Leeds – Pleasant Valley 345 kV Increased % of Total Congestion
- Central East, New Scotland – Leeds Decreased % of Total Congestion

Future Efforts

First Priorities

- Align SCUC and PROBE Modeling **Underway**
  - Constraint Handling
  - Ideal Dispatch Handling
  - New Mitigation Procedure
  - SMD
- Analyze 2004 Q2

Next Priorities

- Unusual Day Analysis ?
- Reporting – What is Desired ?
- Develop Automated SCUC – PROBE Results Comparison
- Automate Calculation Process
- Report Metrics Monthly Going Forward
- Perform “What If” Analysis ?