Congestion Impact Calculation Update

NYISO ESPWG
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3/25/04

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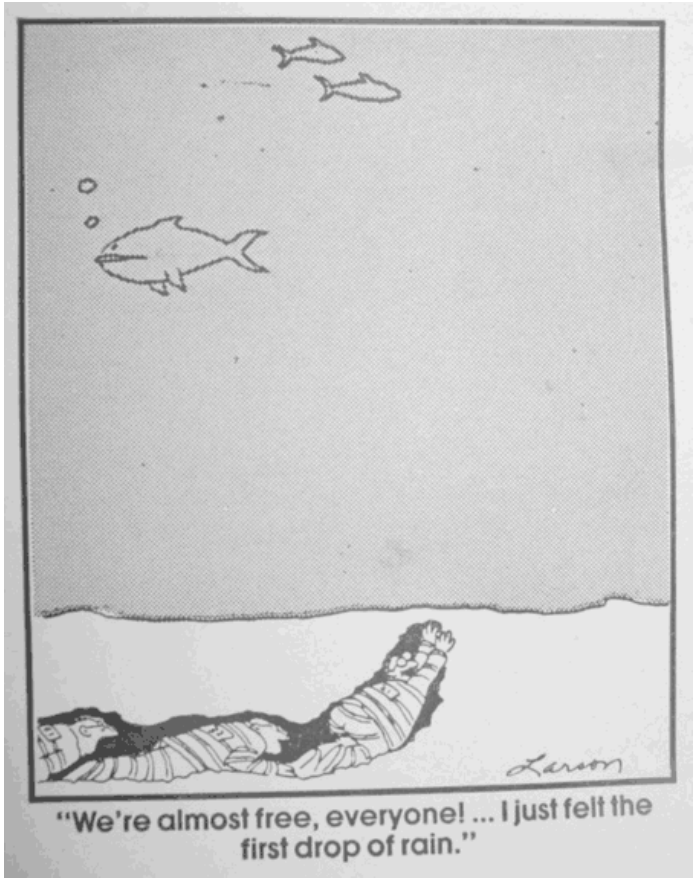
Current Tasks

First Priorities

- 2003 Congestion Impact Calculation
- Align SCUC and PROBE Modeling
- Document Process and Results Interpretation
- Collect 2004 Data

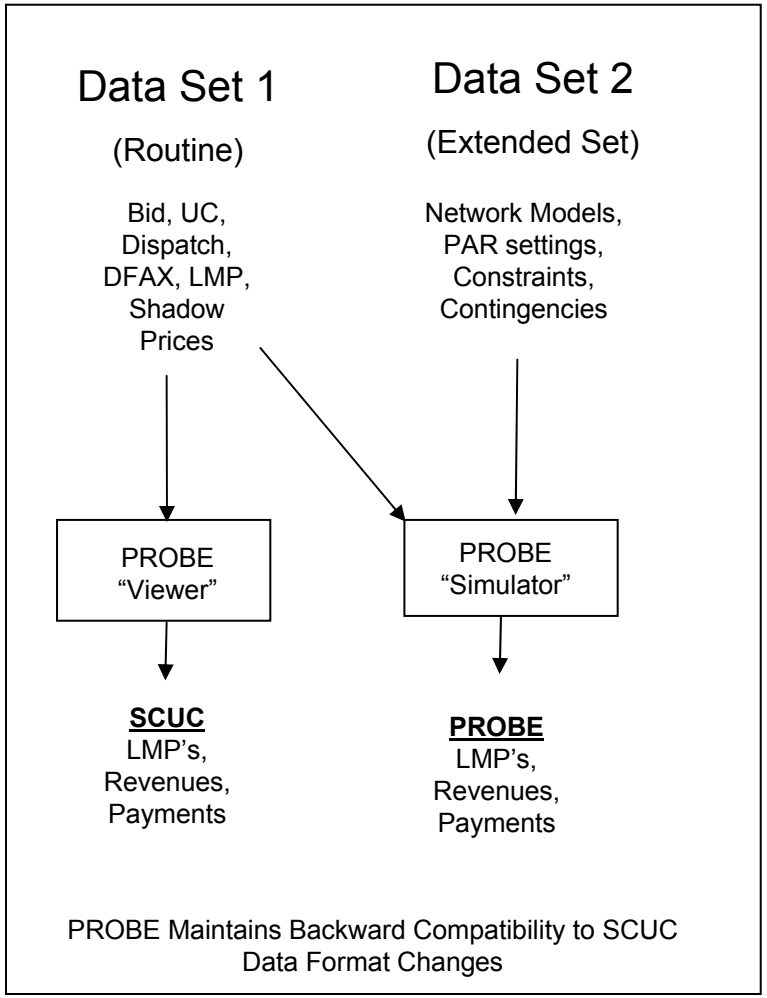
Next Priorities

- Develop Automated SCUC – PROBE Results Comparison
- Automate Calculation Process
- Report Metrics Monthly Going Forward



Data

Data Needs



Data Status

- 2003
  - Set 1 Data Has Been Extracted and Validated for the Entire Year (3+ GB)
  - Set 2 Data is Unavailable for 2003
- 2004
  - Data Sets 1 and 2 Received for Jan and Feb 2004. Awaits Checking (2GB / mo)
  - Daily Storage of Both Datasets Now Routine
  - Weekly Analysis Anticipated

Calculation

- 2003
  - Constrained Results Complete
    - LMP's Revenues, market details available and summarized for each 2003 hour
  - Unconstrained Results Using "PROBE Lite" Now in Debug Stage
    - 7 hours calculation time
  - 5 Issues Need to Be Decided
    - TCC Allocation by Zone
    - Handling Daylight Savings Time Shift Days
    - What Adjustments for Unusual Events, Storm Watch, etc.? When and How?
    - Combine Results for Parallel Monitored Elements ?
    - How to Allocate Energy Cost Change From Constrained – Unconstrained to the Constraints
- 2004
  - First Critical Task – Data Validation

PRELIMINARY 2003 Results
Congestion Payments ONLY

PRELIMINARY RESULTS as of 3/25/04

New York Zonal and State Congestion Payments 2003

Zone	Zone Name	Congestion Payments	TCC Hedge	Unhedged Congestion Payments
A	WEST	-$322,198	$3,005,109	-$3,327,307
B	GENESE	$1,504,921	$19,754	$1,485,167
C	CENTRL	$1,694,567	$4,134,945	-$2,440,378
D	NORTH	-$35,088	-$2,691,688	$2,656,600
E	MHKVL	$165,871	$2,505,360	-$2,339,489
F	CAPITL	$14,067,091	$9,001,051	$5,066,040
G	HUDVL	$7,319,802	$24,192,065	-$16,872,263
H	MILLWD	$2,140,560	$12,012,771	-$9,872,211
I	DUNWOD	$2,970,951	-$3,057,212	$6,028,163
J	N.Y.C.	$675,800,718	$539,051,808	$136,748,910
K	LONGIL	$240,388,037	$110,638,093	$129,749,944
	NYCA	**$945,695,232**	**$698,812,056**	**$246,883,176**

PRELIMINARY 2003 Results
Constrained Case ONLY

PRELIMINARY RESULTS as of 3/24/04

2003 Trial Balance of New York Out and In Payments

("In" and "Out" from the NYISO Payments Perspective)

$$ Out

Energy (Fixed + PCL +VL - VG) + Losses	$8,092,555,242
Congestion	$945,695,232
Exports	$178,954,616
Wheels	-$3,038,364
Total Out Payments	$9,214,166,726

$$ In

TCC	$683,675,050
Generation	$7,288,927,757
Imports	$1,043,090,579
BPCG (Bid Production Cost Guarantee)	$162,780,510
Total In Payments	$9,178,473,896

Payment Excess	$35,692,831
Payment Excess as % of Payments	0.39%

PRELIMINARY 2003 Results
Congestion Payments ONLY
Top 12 Unhedged Constraining Monitored Elements

PRELIMINARY RESULTS as of 3/25/04

New York Congestion Payments 2003

Monitored Element	Congestion Payments	TCC Hedge	Unhedged Congestion Payments	% of Unhedged Congestion Payments	Cum % of Unhedged Congestion Payments
DUNWODIE 345 SHORE_RD 345 1	$150,137,455	$58,691,021	$91,446,434	31%	31%
CENTRAL EAST - VC	$101,122,423	$37,778,221	$63,344,202	21%	52%
RAINEY__ 138 VERNON__ 138 1	$162,252,157	$124,518,165	$37,733,992	13%	64%
LEEDS___ 345 N.SCTLND 345 1	$51,166,718	$13,948,433	$37,218,285	12%	77%
RAINEY__ 345 DUNWODIE 345	$188,680,954	$152,469,883	$36,211,071	12%	89%
UPNY CONED	$18,688,013	$6,203,515	$12,484,499	4%	93%
VALLYSTR 138 EGRDNCTY 138 1	$9,149,933	$4,127,163	$5,022,770	2%	95%
E179THST 138 HELLGT_E 138 1	$46,722,050	$43,771,041	$2,951,009	1%	96%
PLSNTVLY 345 LEEDS___ 345 1	$3,943,342	$1,232,723	$2,710,619	1%	97%
FRESHKLS 138 WILLWBRK 138 1	-$4,725,020	-$7,269,831	$2,544,811	1%	97%
W49TH_ST 345 SPRNBRK_ 345	$192,091,555	$189,683,986	$2,407,569	1%	98%
JAMAICA_ 138 VALLYSTR 138 1	$3,580,116	$1,643,189	$1,936,927	1%	99%

	Positive and Negative Unhedged Congestion Payments	Positive a Unhedged Congestion Payments	Negative a Unhedged Congestion Payments
Number of Constraints	**56**	**32**	**24**
Total NYCA Congestion Payments	$945,695,232	$978,078,505	-$32,383,273
Total NYCA TCC Hedge	$668,098,919	$690,783,450	-$22,684,531
Total NYCA Unhedged Congestion	$277,596,313	$299,410,944	-$21,814,630

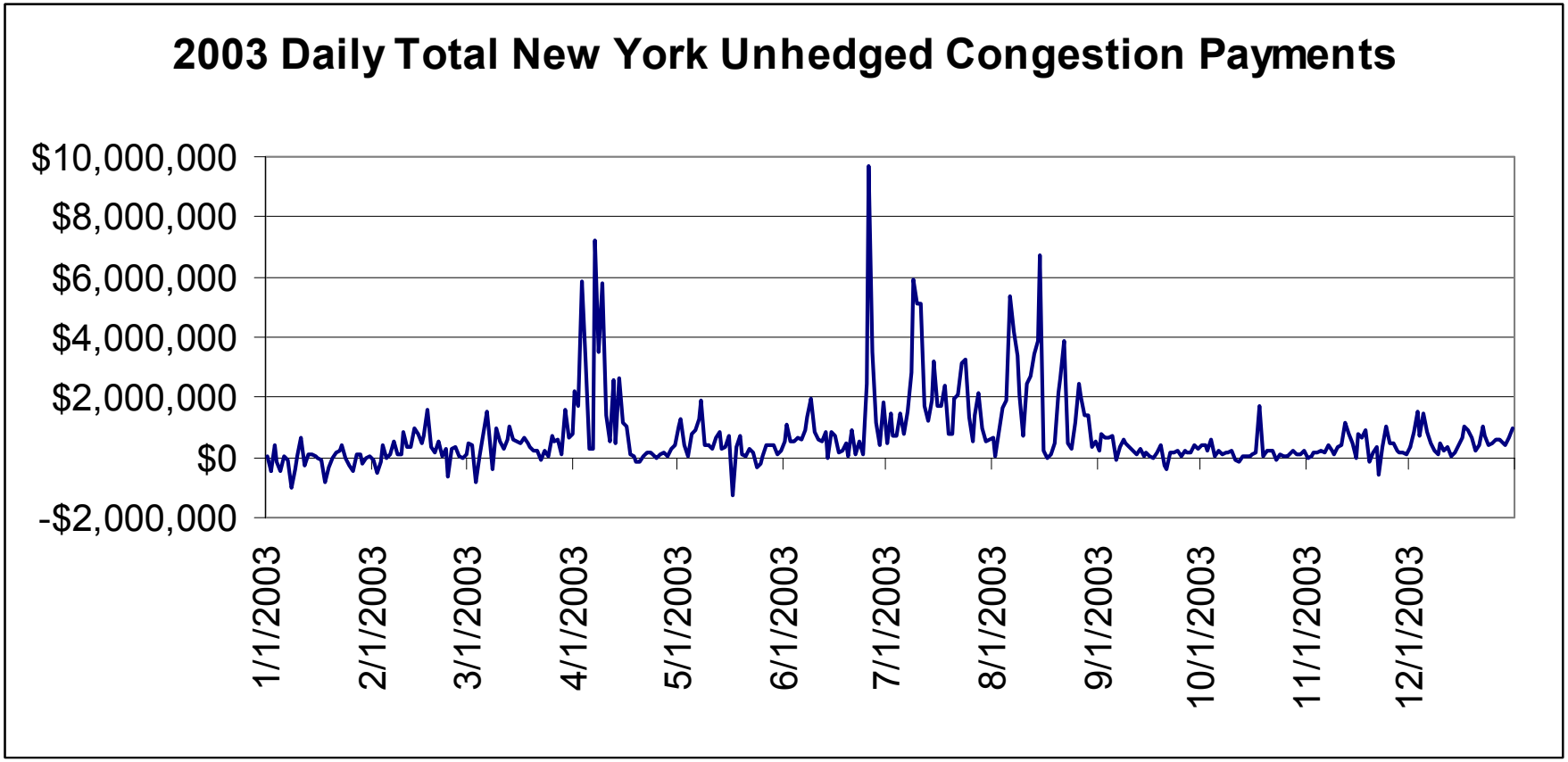
PRELIMINARY 2003 Results
Congestion Payments ONLY
Top 12 Unhedged Constraining Contingencies

PRELIMINARY RESULTS as of 3/25/04
New York Congestion Payments 2003

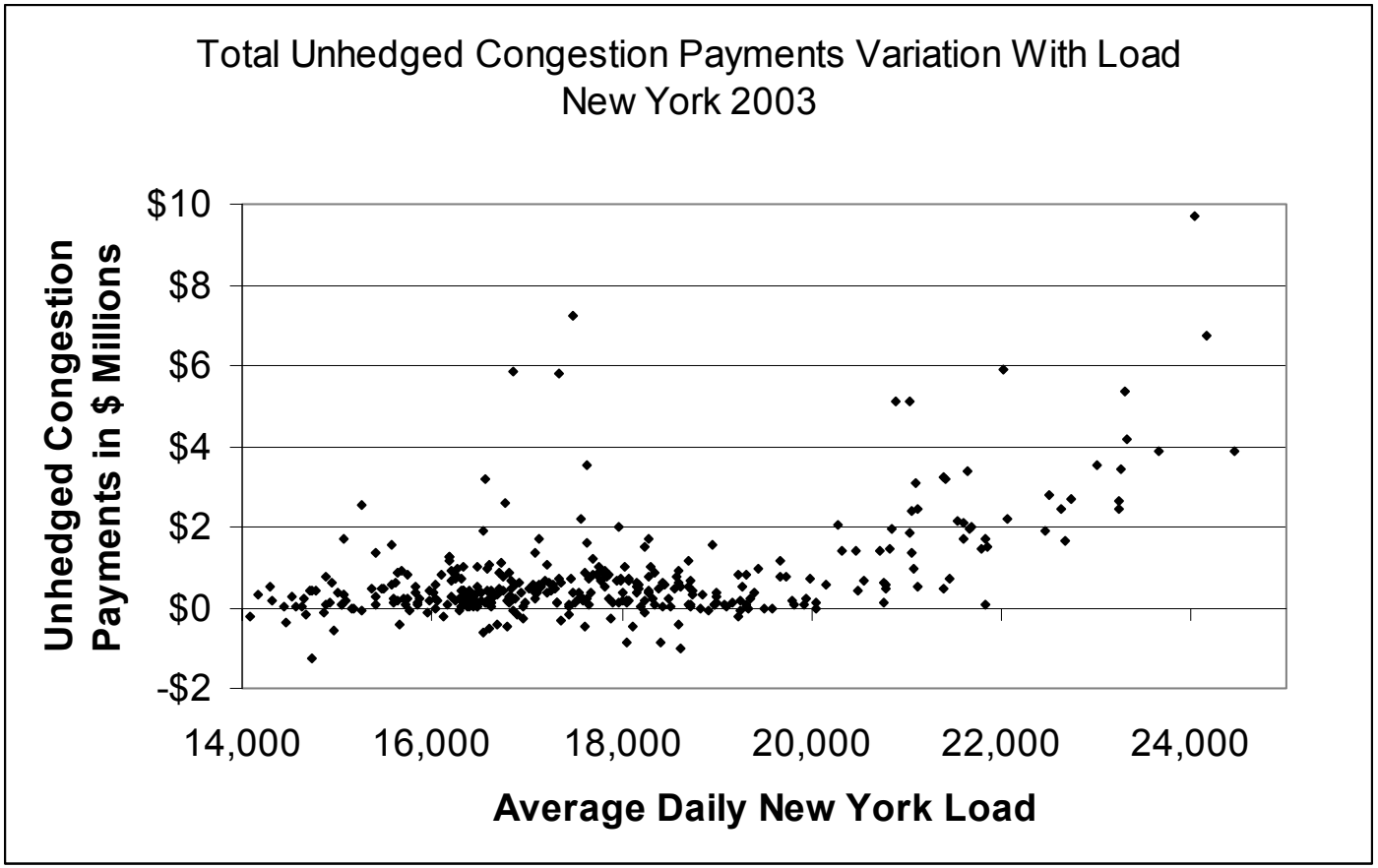
Contingency	Congestion Payments	TCC Hedge	Unhedged Congestion Payments	% of Unhedged Congestion Payments	Cum % of Unhedged Congestion Payments
Base Case	$286,869,211	$169,086,946	$117,782,265	40%	40%
SPRNBRK_345_EGRDNCTY345CY49___	$71,369,978	$24,965,614	$46,404,364	16%	56%
MTN:SCB1 R391OR R94301 O/S LE	$31,984,292	$9,689,566	$22,294,726	8%	64%
SCB: GOETH(8): 42 26 21 GOW	$84,900,757	$64,805,771	$20,094,986	7%	71%
N.SCTLND345_LEEDS___345_94-LN_	$18,998,086	$4,215,057	$14,783,029	5%	76%
DUNWODIE345_RAINEY__345_72____	$62,541,863	$50,658,882	$11,882,981	4%	80%
SPRNBR49345_EGRDNCTY345CY49___	$19,497,540	$8,544,881	$10,952,659	4%	84%
SCB: SPBK (RS-4): M52 99941	$62,809,271	$53,387,763	$9,421,509	3%	87%
DUNWODIE345_RAINEY__345_71____	$30,285,441	$21,296,075	$8,989,366	3%	90%
TWR: 22 21 A2253	$41,658,800	$33,655,672	$8,003,128	3%	93%
W49TH_ST345_E13THSTA345AM54___	$38,585,436	$32,060,727	$6,524,709	2%	95%
BUS: E F BARRET 292 459 BA	$6,491,867	$2,791,354	$3,700,513	1%	96%

	All	Base Case	Single	MTN	SCB	TWR
Number of Contingencies	**67**	**1**	**36**	**6**	**15**	**9**
Hedged Congestion Payments	**$945,695,232**	**$286,869,211**	**$126,423,556**	**$128,841,726**	**$355,226,604**	**$48,334,135**
TCC Hedging	**$668,098,919**	**$169,086,946**	**$42,565,869**	**$110,958,123**	**$307,016,341**	**$38,471,640**
Unhedged Congestion Payments	**$277,596,313**	**$117,782,265**	**$83,857,687**	**$17,883,603**	**$48,210,263**	**$9,862,496**

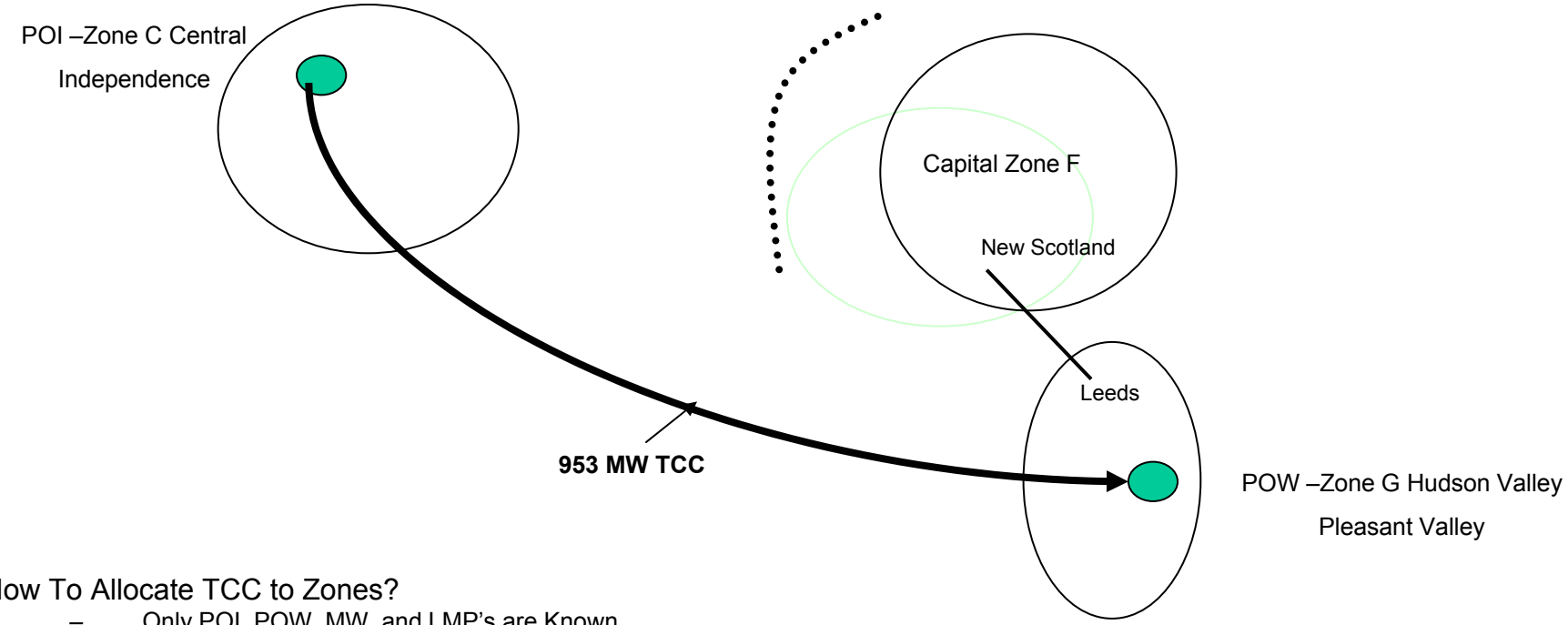
PRELIMINARY 2003 Results
Congestion Payments ONLY



PRELIMINARY 2003 Results
Congestion Payments ONLY



Issue 1: Zonal Allocation



How To Allocate TCC to Zones?

- Only POI, POW, MW, and LMP's are Known
- TCC Payment = LMP $Cong_{PV}$ – LMP $Cong_{Indep}$
- All TCC Payment Assumed to Go to Load
- Which Zone Gets the Payment?
  - Option 1 Credit to Both POI and POW Zone (Problem: Double Counting)
  - Option 2 Credit Half Each to POW and POI Zone (Problem: Why Should Lower Cost Zone Benefit?)
  - Option 3 **RECOMMENDED** – Credit to the Zone With the Higher LMP

Issue 2: Handling Daylight Savings Time Shift Days

- 4/6/03 had 23 hours; 10/26/03 had 25 Hours
- Handling in PROBE Would Take Too Much Development Time for Now
- **RECOMMENDED** Approach for 2003 – Use the Results for the Previous Day
- Address 2004 in the Future

Issue 3: Adjusting 2003 Results

Why ?

- For 2003, The processing is only of SCUC Results, so no adjustments for SCUC – PROBE misalignment are needed
- Desire to Identify and Segregate
  - "Unusual Events"
  - Impact of Reliability Operating Procedures (e.g. storm watch)

- What Adjustments?
- Who Decides ?
- When Needed ?

Issue 3: Results Adjustment Approaches

- Ignore or Separately Report “Unusual Hours” or Days, Maintenance Contingencies
  - Easy
  - Problem: Obscures Congestion that Would have Occurred Even Without the “Unusual Events”
- Ignore Some Contingencies and Rerun PROBE
  - Likely Doable, Needs Research
- Rerate Constrained Facilities
  - Likely Doable, Needs Research
- Adjust Distribution Factors to Represent Network Switching
  - May Not Be Feasible

Issue 4: Combining Parallel Monitored Elements

- During the Year Several Parallel Monitored Elements Had Congestion On Different Days
  - Examples
    - Sprainbrook – 49th St. Circuits 1 and 2
    - Rainey – Dunwoodie Circuits 1 and 2
    - Newbridge – EGC Circuits 1, 2, 3
    - Barrett – Valley Stream Circuits 1 and 2
    - Hudson – Jamaica Circuits 1 and 2
    - Northport – Pilgrim Circuits 1 and 2

- Option 1 Report All Monitored Element/Contingency Combinations (Problem: Long and Confusing List)
- Option 2 Report All
  (Problem: Inconvenient for Seeing the Real Picture)
- Option 3:**RECOMMENDED** Combine "Obvious" Parallel Circuits
  (Problem: What is "Obvious")
- Option 4 Combine "Obvious" and "Related" Circuits
  (Problem: Judgmental)

Issue 5: Congestion Load Payments Impact By Constraint

Load Payments: Difference in (Energy + Losses + Congestion) for Constrained and Unconstrained Cases
Congestion Payments: The Component of LMP Paid Relative to the Marcy Reference Point

- In the Unconstrained Case
  - Energy Cost May Rise
  - Congestion Payments Go to Zero

- Change in (Energy + Losses) Known for State, Allocated to Zone by Given Zonal Factors

- Allocation Factors of (Energy + Losses) Change to Constraints Not Defined

- Suggestion: Allocate Statewide Energy Cost Change to each Constraint in Proportion to the Initial Statewide Congestion Payment in the Constrained Case

Observations and Conclusions

- The Data Collection Process is Getting Well Established and Intense Analysis is Underway *(Thank You NYISO Staff !)*

- The Analysis Process is Very Intense, But the Rewards are Great
  - Unprecedented Views and Analyses of the Market are Now Possible
  - Information Needs to Be Gleaned from the Data
  - Excellent Testbed for Other Analyses is Available with Relatively Small Incremental Effort

- Preliminary Observations from Analysis and Results
  - New York Congestion Payments are Concentrated in Zones J and K
  - Congestion is Fairly Well Hedged (roughly 2/3 of Congestion Payments are hedged)
  - Congestion Occurs throughout the Year In Flashes and at Higher Loads