Congestion Impact Example

NYISO ESPWG
November 18, 2003

11/16/03

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SCUC – PROBE Results Comparison
Top View

July 15, 2003 SCUC Vs PROBE Comparison

	SCUC				Difference % SCUC to PROBE		
Market Segment	**Revenue**	**MWHr**	**Bid Production Cost**		**Revenue**	**MWHr**	**Bid Production Cost**
Generation	$24,420,920	428641	-$1,121,051		0.9%	0.0%	-2.4%
Price Capped Load	$3,175,186	44460	$0		1.6%	0.0%	
Imports	$4,001,710	94579	$1,100,911		0.2%	0.3%	1.5%
Exports	$389,676	9002	$0		1.4%	1.8%	
Wheels	-$5,483	3833	$0		-5.0%	0.6%	
Virtual Load	$3,039,816	56903	$0		-0.4%	-0.4%	
Virtual Generation	$1,758,292	33689	$0		-2.1%	-0.9%	
	$2,473,070						

SCUC – PROBE Results Comparison
Allocation to Constraints

July 15, 2003 SCUC vs PROBE Comparison

Monitored Facility	Contingency	SCUC	Simulator	Difference	% Difference if $ > 1% of Total Congestion Allocation
*** Energy+Losses		$25,493,598	$25,757,558	-$263,960	1.04%
E179THST 138 HELLGT_E 138 1	Base Case	$927,909	$763,307	$164,602	17.7%
HUDS_AVE 138 JAMAICA_ 138 2	Base Case	$216,671	$110,841	$105,830	48.8%
DUNWODIE 345 SHORE_RD 345 1	SPRNBRK_345_EGRDNCTY345CY49___	$836,590	$748,011	$88,579	10.6%
LEEDS___ 345 N.SCTLND 345 1	MTN:SCB1 R391OR R94301 O/S LE	$3,588,590	$3,476,611	$111,979	3.1%
	Energy & Losses	$25,493,598	$25,757,558	-$263,960	-1.0%
	Congestion	$5,569,760	$5,098,770	$470,990	8.5%
	Total	$31,063,358	$30,856,328	$207,030	0.7%

Example Impact Calculation Notes

- Network Model
  - Branch Status of July 15, 2003
  - Normal Contingency List
- Generation
  - Generation Availability and Bids from Actual SCUC Hourly Day Ahead Market (DAM) Data
  - Given, Fixed Unit Commitment Compared to SCUC
  - Pre-Mitigated Bids Used for Bid Production Cost Calculation
- PARs
  - Fixed Schedule

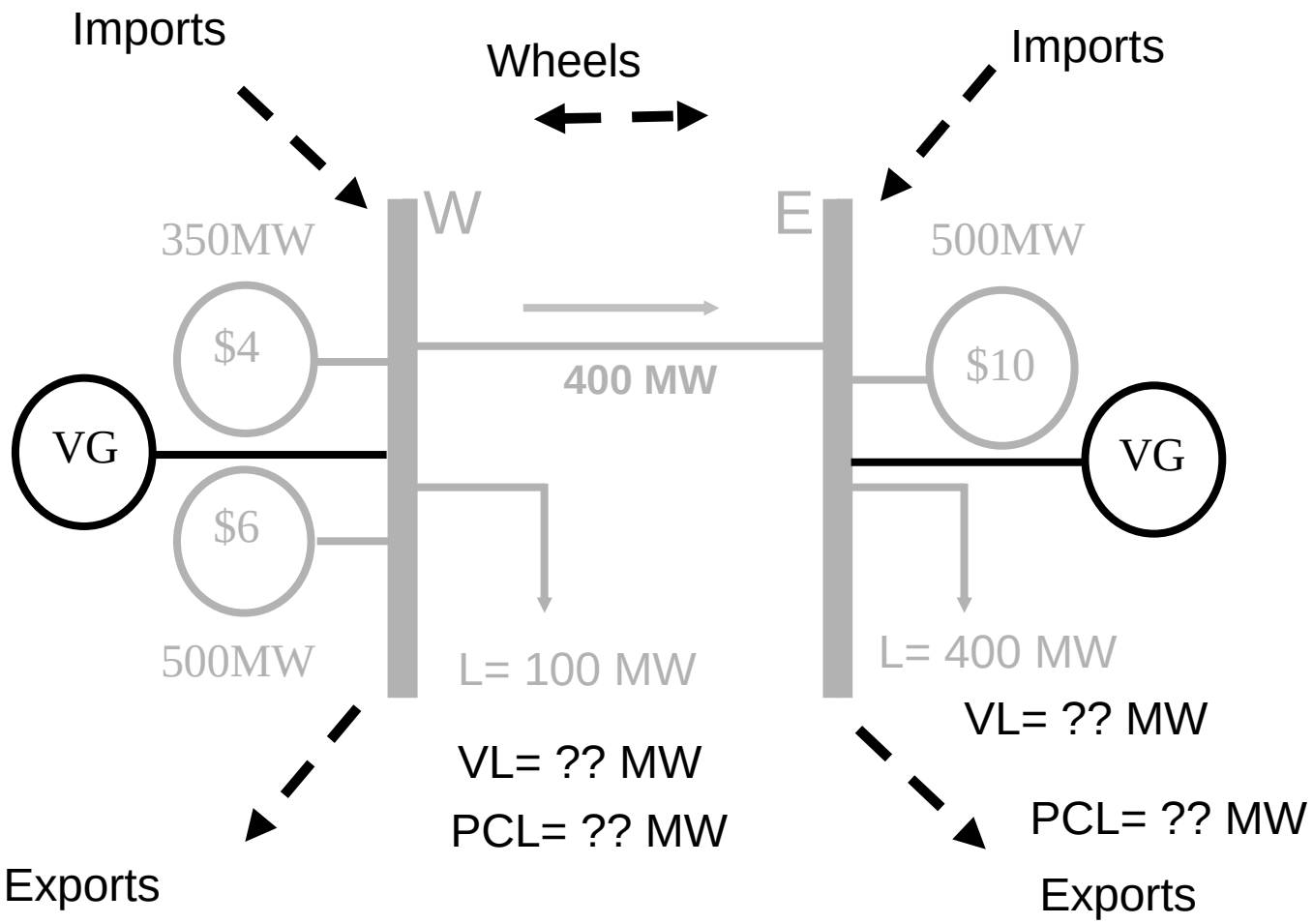
July 15, 2003 Congestion Impacts Metrics (All Optimized)

Impact On	Description	Metrics	Sample Calculation
Bid Production Costs	Difference Between Transmission Constrained and Unconstrained Bid Production Cost	• Production Cost Decrease	$45,322
Load Payments	Difference Between Transmission Constrained and Unconstrained Total Load Payments (Energy + Losses + Congestion)	• Total Impact • TCC Credit • Net Impact	($ 289,487) $ 879,738 $ 1,169,225
Congestion Payments	Congestion Rent Paid (According to NYISO Congestion Accounting Definition) Congestion LMP * Zonal Load	• Total Paid • Hedged • Unhedged • Net Unhedged (includes TCC & TSC Cost)	$ 2,105,079 $ 879,738 $ 1,225,342 N/A
Physical Flows	Flow Duration vs. Limit for Key Flowgates	• Flow Duration Charts	From Operations

July 15, 2003 Congestion Zonal

		Load Payments			Congestion Payments		
	Zone	Total Impact	TCC Credit	Net Impact	Total	Hedge	Unhedged
A	WEST	-$266,238	?	?	-$38,172	?	?
B	GENESE	-$180,616	?	?	-$6,642	?	?
C	CENTRL	-$174,144	?	?	-$3,681	?	?
D	NORTH	-$10,995	?	?	$0	?	?
E	MHKVL	-$64,014	?	?	$124	?	?
F	CAPITL	-$175,516	?	?	$231	?	?
G	HUDVL	-$54,626	?	?	$36	?	?
H	MILLWD	-$40,240	?	?	$120	?	?
I	DUNWOD	-$83,650	?	?	$174	?	?
J	N.Y.C.	$191,454	?	?	$1,064,876	?	?
K	LONGIL	$569,124	?	?	$1,088,038	?	?
	Total	**-$289,461**			**$2,105,104**		

“Real” 2 Bus Example



Calculation Details to Decide

- Market Segments
  - Which to Include in the Calculation ?
- Mitigated or Unmitigated Bid Production Cost ?
- TCC Ownership
  - All, Fixed Load, or ?
  - TCC by Zone ?
  - NY Only ?
- TSC Handling ?

Metrics Sensitivities July 15, 2003

July 15, 2003 Effect of Market Segment Assumptions on Congestion Metrics

Market Segment	**Changeable in Calculation**			
Generators	X	X	X	X
Imports, Exports, Wheels		X	X	X
Virtual Load,& Generation				X
Price Capped Load			X	X

Constrained BPC	-$171,418	-$294,213	-$244,978	-$212,508
Unconstrained BPC	-$208,268	-$403,437	-$384,889	-$257,829
Impact	**$36,851**	**$109,224**	**$139,911**	**$45,322**

Constrained				
Energy	$30,881,832	$29,118,596	$29,255,904	$29,148,496
Congestion	$909,480	$1,499,584	$1,553,394	$2,105,079
Total	$31,791,312	$30,618,180	$30,809,298	$31,253,575

Unconstrained				
Total	$32,684,658	$31,096,498	$31,154,326	$31,543,062
Impact	**-$893,346**	**-$478,318**	**-$345,028**	**-$289,487**
TCC	**$21,800**	**$464,035**	**$508,757**	**$879,738**
Net Impact	**-$871,546**	**-$14,284**	**$163,729**	**$1,169,225**

Constrained				
Congestion	$909,480	$1,499,584	$1,553,394	$2,105,079

Unconstrained				
Congestion	$0	$0	$0	$0
Impact	**$909,480**	**$1,499,584**	**$1,553,394**	**$2,105,079**
TCC Hedged	**$21,800**	**$464,035**	**$508,757**	**$879,738**
Unhedged	**$887,680**	**$1,035,550**	**$1,044,637**	**$1,225,342**
Net Unhedged				

Next

PROBE Software

- Refine PROBE Modeling to Tighten SCUC/PROBE Alignment (Allocation of Costs to Constraints)
- Develop & Benchmark PROBE Incremental Unit Commitment
- Develop PROBE Automation of Metrics Calculation
- Add Hedging by Constraint
- Develop TCC Cost Data and PROBE Handling

Calculation

- Produce 2003 Metrics by Month and Annual Total
- Report Metrics Monthly Going Forward

Reporting Suggestions

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

	Report By			
	NY Total	**Zones**	**Monitored Element**	**Contingency**
Bid Production Cost Decrease	✓			
Total Load Payment Impact	✓	✓	✓	✓
Load Payment TCC Credit	✓	?	✓	✓
Net Load Payment Impact	✓	?	✓	✓
Total Load Congestion Payments	✓	✓	✓	✓
Hedged Load Congestion Payments	✓	?	✓	✓
Unhedged Load Congestion Payments	✓	?	✓	✓
Net Unhedged Load Congestion Payments	✓	?	?	?