

Improved Transmission Constraint Pricing

**Market Issues Working Group
February 5, 2007**

Outline of Today's Presentation

- Concept Review
- Review “Next Steps” from Previous Discussions
- Updated Historical Shadow Cost Analysis
- Testing Operational and Reliability Impacts
- Recommendation
- Timeline

Concept Review: Background

- **The scheduling and pricing models in SCUC and RTS include a high penalty cost in the objective function for transmission constraints which currently is a multiplier of the highest energy supplier's costs.**
- **Penalty costs allow transmission constraints to be violated when sufficient resources are not available to obtain feasible solutions.**
- **Penalty costs are considered to be too high if they result in ineffective generation re-dispatch in response to transmission constraints given established operating practices and capabilities.**
- **A recalibration of the penalty costs for transmission constraints will improve consistency between current operational practices and efficient generation resource scheduling during unexpected operating conditions.**
- **Efficient generation resource scheduling means that the dispatch of generating resources to address transmission constraints should be operationally effective, rational, and minimize operator intervention.**

Concept Review: Expected Benefits

- Operations / Market Benefits
 - ✓ *Efficient integration of normal market scheduling processes and, if necessary, still allow for additional operational actions to meet reliability objectives*
 - ✓ *Reduced need for operator intervention to address ineffective or irrational generation scheduling*
 - ✓ *Reduced Balancing Market Residuals as a result of more efficient Real-Time Market resource scheduling during unexpected or unusual operating conditions*
 - ✓ *May reduce need for price corrections due to potentially fewer operationally ineffective scheduling*

Next Steps from 11/21/06 MSWG/SPWG

- Continue MIWG discussion of design concepts, including the considerations for revised transmission constraint penalty costs
 - *An objective for today*

- Continue evaluation of operational and reliability impacts
 - *An objective for today*

- Propose recommendation for revised transmission constraint penalty costs
 - *An objective for today*

Historical Shadow Cost Analysis – As presented on 11/21/06

Shadow Cost up to:	Frequency	Cumulative %
500	136001	97.70%
600	643	98.16%
700	494	98.52%
800	295	98.73%
900	261	98.92%
1000	201	99.06%
1100	161	99.18%
1200	103	99.25%
1300	75	99.31%
1400	62	99.35%
1500	78	99.41%
1600	73	99.46%
1700	65	99.51%
1800	40	99.53%
1900	45	99.57%
2000	25	99.58%
3000	247	99.76%
4000	119	99.85%
5000	51	99.88%
6000	31	99.91%
7000	21	99.92%
8000	24	99.94%
9000	19	99.95%
10000	8	99.96%
More	58	100.00%
139200		

- Original analysis included all base and contingency constraints (non-TSA) for the period of 10/1/2005 – 9/30/2006
- Illustrates the frequency (and cumulative %) of RTD intervals with a transmission constraint shadow cost up to a given value
- 99.9% threshold value for all intervals -> \$6000/MWh
- 99.95% threshold value for all intervals -> \$9000/MWh

Updated Historical Shadow Cost Analysis

Shadow Cost up to:	Frequency	Cumulative %
500	133662	98.02%
600	606	98.47%
700	464	98.81%
800	277	99.01%
900	252	99.19%
1000	191	99.33%
1100	154	99.45%
1200	92	99.51%
1300	62	99.56%
1400	48	99.59%
1500	62	99.64%
1600	50	99.68%
1700	39	99.71%
1800	28	99.73%
1900	29	99.75%
2000	17	99.76%
3000	191	99.90%
4000	72	99.95%
5000	25	99.97%
6000	11	99.98%
7000	5	99.98%
8000	4	99.99%
9000	4	99.99%
10000	3	99.99%
More	13	100.00%
136361		

- Detailed operational review of certain constraints resulted in an updated analysis
- Constraints that are no longer considered or did not impact reliability based criteria were removed
 - ✓ *Incorrect transmission operating limits resulted in incorrect constraints*
 - ✓ *No future need for re-dispatch; the operational circumstances related to such constraints that were secured no longer exist*
- 99.9% threshold value for all intervals -> \$3000/MWh
- 99.95% threshold value for all intervals -> \$4000/MWh

Testing of Operational and Reliability Impacts

- An important operational requirement in the validation of a revised transmission pricing threshold is to ensure that historical levels of effective generation re-dispatch will continue (e.g. 99.95% of historical re-dispatch for valid operational requirements)
 - ✓ *Detailed review of historical pricing outcomes verifying reliability need of required operational dispatch*
 - ✓ *Confirmed reliability need for up to \$4000/MWh re-dispatch for certain transmission constraints that are expected under normal operations*
 - **Central-East Interface constraint: \$2000/MWh re-dispatch threshold**
 - \$1000MWh dispatch offer/0.50 shift factor for NYC/LI zone generation
 - **Leeds-Pleasant Valley contingency constraint: \$3500/Mwh re-dispatch threshold**
 - \$1000MWh dispatch offer/0.29 shift factor for NYC/LI zone generation

Testing of Operational and Reliability Impacts

- To further verify the reliability need for a \$4000/MWh transmission constraint pricing threshold, the ISO investigated the impact of lower thresholds on the re-dispatch capability for the Leeds-Pleasant Valley contingency constraint.

- The following test results were found;
 - ***At the \$4000/MWh threshold, the constraint relief is at a level meeting reliability requirements***
 - ***With a \$3000/MWh threshold, the constraint relief was 12MW less***
 - ***With a \$2000/MWh threshold, the constraint relief was 65MW less***
 - ***With a \$1000/MWh threshold, the constraint relief was 104MW less***

- These tests demonstrate the reliability benefit of the \$4000/MWh constraint pricing threshold as compared to lower values

Testing of Operational and Reliability Impacts

- An additional operational consideration is the coordination of the proposed transmission constraint pricing threshold with the Operating Reserves Demand Curves.
- This capability to “convert” operating reserves to energy was the operational reason for the establishment of the ISO Locational requirements for Eastern New York and the Long Island zone.
- Therefore, it is important to set the transmission constraint pricing threshold to a level higher than the Operating Reserves Demand Curves thresholds.

Testing of Operational and Reliability Impacts

Operating Reserve Requirements		Demand Curve Value
NYCA	Spin	\$500
NYCA	10 Min	\$150
NYCA	30 Min	\$200
EAST	Spin	\$25
EAST	10 Min	\$500
EAST	30 Min	\$25
Long Island	Spin	\$25
Long Island	10 Min	\$25
Long Island	30 Min	\$300
Total value if deficient in all requirements		\$1,750

- Assuming a total value of Operating Demand Curves at \$1750/MW if deficient in all categories of operating reserve requirements, a \$4000/MWh transmission constraint pricing threshold ensures that the normal scheduling process will meet desired reliability objectives by scheduling energy to address transmission constraints.

Recommendation

- The implementation of the proposed improved transmission constraint pricing will improve the consistency of current operational practices related to ISO transmission grid operations and efficient generation resource scheduling.
- Based on the historical analysis and the testing and review of the operational and reliability impacts, NYISO recommends that the transmission constraint pricing threshold be set to \$4000/MWh.
- Similar to the existing ISO operation using Operating Reserves Demand Curves, the proposed transmission constraint pricing threshold will not limit the actions that can be used by ISO Operations staff to address transmission constraints in the event generating resources are available but have not been scheduled.

Stakeholder Review and Filing Schedule

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| ■ Filing Language Prep | Jan / Feb |
| ■ MIWG | February 5 |
| ■ OC (Special Meeting) | February TBD |
| ■ Filing Language Distributed | February 12 |
| ■ BIC (Special Meeting) | February TBD |
| ■ MC | February 21 |
| ■ NYSRC | February TBD |
| ■ BOD | March 12 |
| ■ FERC Filing | April 1 |
| ■ Implementation Effective | June 1 |