

Improved Transmission Constraint Scheduling & Pricing

**Business Issues Committee
February 13, 2007**

Outline of Today's Presentation

- Concept Review
- Historical Transmission Constraint Cost Analysis
- 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*

Historical Constraint Cost Analysis

<i>Shadow Cost up to:</i>	<i>Frequency</i>	<i>Cumulative %</i>
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%
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- Detailed operational review of all historical transmission constraints resulted in this analysis
- All base and contingency transmission constraints were considered (excluding TSA contingencies) for the period of 10/1/2005 – 9/30/2006
- 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.
- A \$4000/MWh transmission constraint pricing threshold ensures that the normal ISO scheduling process will meet desired reliability objectives to address transmission constraints even if the ISO is deficient in all categories of operating reserve requirements.

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.

TCP Draft Filing Schedule

- MIWG February 5
- OC (informational) February 8
- NYSRC February 9
- **BIC (for vote) February 13**

- **To be updated....**