

Memorandum

To: ISO Board of Governors

From: Mark Rothleder, VP of Market Quality and Renewable Integration

Date: December 6, 2012

Re: **Decision on Transmission Constraint Relaxation Parameter Modification**

This memorandum requires Board action.

EXECUTIVE SUMMARY

Management recommends the Board approve the reduction of the real-time scheduling run transmission constraint relaxation parameter from \$5,000/MW to \$1,500/MW. This parameter reflects the cost at which the market software will cease to attempt to reduce flows on a transmission constraint to a level within an operating margin of the actual flow limit through dispatch of effective bids. Lowering this parameter will reduce the cost of congestion when reasonably effective economic bids have been exhausted to relieve the constraint.

In recent months, the real-time congestion offset costs have increased significantly. Congestion offset costs account for real-time surpluses or shortages of congestion revenue. The real-time congestion offset costs are allocated to load and exports. The increase in congestion offset costs is a result of increased frequency of high prices to resolve real-time congestion below the level scheduled in the day-ahead market. At the current transmission parameter setting, the market is pricing the relaxation of transmission constraint at significantly higher prices than is necessary to dispatch resources reliably to achieve flows within actual limits. This has resulted in significantly higher real-time congestion prices, and a corresponding significant increase in the congestion offset costs.

Sensitivity analysis comparing the impact of different parameter settings on schedules and congestion costs show that lowering the parameter to \$1,500/MW would reduce unnecessary high real-time congestion costs by 36% while continuing to use effective economic bids resulting in reliable dispatch solutions consistent with actual system conditions and constraint limits.

Moved, that the ISO Board of Governors approves the proposal to lower the transmission constraints relaxation parameter from \$5,000/MW to \$1,500/MW as described in the memorandum dated December 6, 2012; and

Moved, that the ISO Board of Governors authorizes Management to make all the necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

DISCUSSION AND ANALYSIS

In 2008, prior to the start of the ISO's nodal market, the Board approved a new policy governing the setting and management of market software parameters that would determine the extent of measures taken to relieve congestion and adjustment of self-schedules in the event that the market lacks sufficient effective bids to relieve the constraints modeled in the various market runs. At the time, Management also committed to consider revising the parameter values in the event the parameters are found to be causing significant unintended consequences in terms of either software performance or market results.

The market software attempts to balance supply and demand subject to relieving a transmission constraint or respecting self-schedules based on the assigned parameters. At times, all operationally reasonable economic measures are exhausted, yet the flow on the transmission constraint is still over its modeled limit. In such cases, the optimization must adjust uneconomic schedules or relax constraints to produce a market solution. The priority with which constraints and self-schedules are adjusted is governed by a series of hierarchical rules reflected in the scheduling and pricing parameters. These are referred to as uneconomic adjustment parameters. One of the established uneconomic adjustment parameters is the scheduling run transmission constraint relaxation parameter of \$5,000/MW. This parameter reflects the price beyond which the software will relax a transmission constraint rather than continue to dispatch ineffective resources to relieve congestion. In cases where a transmission constraint must be relaxed, the price of relieving the constraint could be between the pricing run parameter of \$1,000/MW and the scheduling run parameter of \$5,000/MW.

Since the start of the new nodal market in April 2009, the ISO and market participants have monitored and evaluated the performance of the software parameters. Starting in July 2012, however, the ISO observed a significant increase in real-time congestion prices and consequently real-time congestion offset costs. The real-time congestion offset costs for August 2012 was \$50 million, which is ten times the normal monthly level of less than \$5 million observed prior to August 2012. The increased frequency of the high priced congestion, coupled with reduced limits in real-time versus the day-ahead market, resulted in the increase in the real-time congestion offset costs. In the months of August, September and October, real-time congestion prices on some constraints were at \$3,000/MW to \$5,000/MW for a large number of intervals. High real-time congestion prices were caused by a combination of: 1) increased frequency of constrained conditions in real-time, 2) increased amounts of unscheduled flow, 3) operational margin, and 4) reduced or lack of controls to relieve the constraint.

Reducing the parameter to \$1,500/MW would have reduced the real-time congestion offset costs for the period of August 1 to October 22, 2012 by 36% while providing little change in flow relief.

ISO staff conducted a sensitivity analysis to assess the impact of various parameter settings on prices and measured flows. Initially, staff considered reducing the parameter to \$2,500/MW. This analysis proved to provide robust market schedules while reducing congestion offset costs by 18%. Additional analysis of results using lower parameters demonstrated that the market solution continues to be robust even at lower parameter levels. Specifically, when the transmission constraint relaxation parameter was reduced to \$1,500/MW, the price on the overloaded constraint was reduced to \$1,500/MW, while power flow on the constraint increased only slightly, less than 1% of the constraint limit in most cases. If congestion cannot be relieved at a cost of \$1,500/MW, it would be appropriate for the operators to consider other measures to relieve the congestion, including consideration of adjustment of intertie schedules, reduction of margins established to maintain the flows below the actual limit, or transmission switching, where appropriate. The analysis demonstrated that there is a diminishing rate of return as the parameter increases to higher levels. In contrast, the analysis also showed that lowering the parameter beyond \$1,500/MW poses a risk that the market run would overlook an effective economic bid (*i.e.*, a bid with a price that could help relieve the constraint) that would provide a reliable market solution and avoid the need for manual intervention by operators.

The recommended parameter adjustment is only one measure the ISO has taken to address high real-time congestion offset costs. The ISO staff undertook other measures such as conforming the day-ahead limit to be more aligned with the real-time limit in order to converge the day-ahead and real-time market conditions. While these steps helped lower the real-time congestion offset costs in the months after August, they did not bring the levels back to the lower levels experienced in prior months. Management will continue to consider and address other root causes to further reduce the real-time congestion offset costs.

POSITIONS OF THE PARTIES

In response to the sustained significantly high levels of the real-time congestion offset, Management launched a stakeholder process on October 19, 2012 to consider lowering the transmission constraint relaxation parameter to achieve more reasonable levels of the congestion offset. After receiving initial comments on the ISO staff proposal to lower the parameter to \$2,500, ISO staff conducted additional analysis to further inform the decision to lower the parameter to lower levels. While certain stakeholders requested additional confirmation that the reduction was necessary, others sought confirmation that further reductions would not undermine an efficient market outcome. As discussed above, the additional analysis confirmed that a reduction of the parameter to \$1,500 strikes the proper balance between protecting the transmission constraints and proper utilization of available effective bids in clearing the market to serve demand.

ISO staff also provided additional explanation of the actions it has taken to address the root causes of the discrepancies in modeled constraints and flows between the day-ahead and real-time markets, which also will contribute to the reduction of the real-time congestion offset costs.

The generator and marketer communities continue to express concern over lowering the parameter to \$1,500/MW. In particular, the generator community is concerned that the lower parameter would take millions of dollars out of the locational marginal prices cleared in the market and would erode price signals for investment in locally constrained areas. In addition, parties have expressed concerns that lowering the \$1,500/MW will result in an increased reliance on exceptional dispatches (*i.e.*, out-of-market actions). Some commented that instead of lowering the parameter, the ISO should increase the resource effective threshold at which the ISO considers an economic bid to be effective. Finally, parties have requested that if the ISO adopts the lower parameter, it should be reset back to \$5,000 automatically on a sunset date.

In response to concerns regarding the possibility that the lower parameter would reduce congestion revenue to suppliers, the ISO conducted further analysis and determined that the bulk of the revenue associated with the higher congestion offset costs was earned by convergence bidders taking the opportunity to arbitrage diverging day-ahead real-time prices. The ISO analysis shows that even with a lower parameter, generators with effective bids in relieving local transmission constraints will continue to be part of the market solution and will be compensated at a price equal or greater than their dispatched bid. In addition, because the market is able to continue to dispatch adequate generation and maintain flows well within the margins of actual transmission constraint limits, it does not appear the lower parameter would increase reliance on exceptional dispatches. Management also has determined that increasing the resource effectiveness threshold is not helpful in all cases in selecting the necessary generation to relieve the constraints at reasonable costs. This is because when all effective bids from resources internal to the constraint are exhausted, re-dispatching resources outside the constraint will not provide operationally relevant congestion relief.

Management understands, however, that there may be a need to revise the parameter again in the future. In response to stakeholders concerns, Management commits to continue to perform sensitivity analyses after the parameter has been lowered and provide updates to market participants at the regularly held Market Performance and Planning Forum.

In contrast, the load serving entities supported the reduction of the parameter and urged the ISO to consider reducing the parameter further to a level as low as \$1,000/MW. At this time, Management does not believe lowering the parameter to a level lower than \$1,500/MW would be appropriate because the sensitivity analysis conducted by ISO staff and shared with stakeholders shows that such a lower level risks the software bypassing effective economic bids. This would erode the robustness of the market solution observed at the \$1,500/MW level and above.

CONCLUSION

Management proposes to reduce the scheduling run transmission constraint in the real-time market from \$5,000/MW to \$1,500/MW as it would significantly reduce the cost of congestion. The proposed parameter reduction would have reduced the real-time constraint offset cost in August, September and October this year by 36%. Moreover, the impact on reliability measured by power flow increase has shown to be very small. Management therefore concludes that the parameter reduction is justified and appropriate in reducing market cost while maintaining reliability.