



Memorandum

To: ISO Board of Governors

From: Benjamin F. Hobbs, Chair, ISO Market Surveillance Committee

Date: February 9, 2017

Re: **Briefing on MSC activities from Dec. 3, 2016 to Feb. 3, 2017**

This memorandum does not require Board action.

During the period covered by this memorandum, members of the Market Surveillance Committee reviewed materials and conferred with ISO staff on several ISO initiatives.

Members also prepared for the general session meeting of the MSC that was held on February 3, 2017 at the ISO's Folsom campus. The issues addressed at this meeting include the ISO greenhouse gas compliance proposal, the ISO contingency modeling enhancement initiative, the Department of Market Monitoring transmission rights auction reform proposal, and recent renewable curtailments and their interaction with the energy imbalance market.

1. *Accounting for greenhouse gas compliance under California AB32 for a multistate power market.*

This agenda item concerned the evolving policy of the California Air Resources Board concerning attribution of carbon dioxide emissions to imports of power to California from other regions in the energy imbalance market (EIM), and a proposal by the ISO concerning assigning of responsibility for emissions to resources in the EIM. Mr. Don Tretheway, Senior Advisor for Market Design and Regulatory Policy at the ISO summarized the status of the present proposal.

MSC members then discussed several issues, some of which had previously been raised in stakeholder comments. One issue discussed was whether the two pass process might encourage clean sources outside the ISO to prefer to forward contract with load serving entities in California rather than participate in the EIM, because they could then be assured of receiving the California price, which would reflect the value of greenhouse gas allowances. Mr. Tretheway replied that there would indeed be an incentive to forward contract predicted outputs, but this should not affect the willingness to offer imbalances (positive or negative) in the EIM. Another issue was whether the two pass procedure provided incentives to alter the base schedule; since neither pass is constrained by that schedule, this appears to not be the case. A third issue is whether simplifications necessary to enable timely solution of the first pass might result in distortions in greenhouse gas attributions. The extensive testing that the ISO plans to

undertake later this year of the two pass procedure is intended to identify whether any of the simplifications might result in artefactual attributions.

2. Contingency modeling enhancements: Prototype results.

This agenda item involved review of results of market simulations of the effect of explicit inclusion in the market operations software of reactive (post-contingency) actions to manage certain crucial transmission contingencies in the ISO network, as opposed to managing those contingencies using constraints that require a certain amount of capacity to be on-line within the ISO's zones. The objective of the proposed constraints is to minimize the cost of returning the ISO's system to a secure operating point within 20 minutes.

Dr. Lin Xu, Senior Advisor, Market Analysis summarized the results of market simulations of the price and other impacts of the contingency constraint. Out of twelve days simulated, the constraint only affected the dispatch and prices in four hours in one day. The presentation summarized in some detail how the constraint changed the amount of capacity procured and the effect on prices in different zones in the ISO. Based on the shadow prices of the constraint, a MSC member estimated that an upper bound for the cost of the constraint to be \$10,000 for that one day, relative to a production schedule in which no constraint was imposed. All comparisons were relative to market operations without any constraint. Thus, these comparisons do not assess the cost savings that would result from use of the contingency modeling enhancement relative to the present practice of imposing a lower bound on the amount of online capacity by zone.

One conclusion reached was that if further analyses show that the contingency modeling enhancement is an inexpensive and rarely binding means of satisfying the reliability requirement, then there is unlikely to be a need for an elaborate revision of the financial transmission rights to accommodate the new constraint.

3. Recent experience with renewable energy curtailments and interactions with imports and exports in the energy imbalance market

Mr. Rahul Kalaskar, ISO Market Validation and Quality Analyst Lead, summarized the upward trend in curtailments of wind and solar production that has occurred since the summer of 2016. He discussed the reasons for those curtailments, which are primarily because of low prices that arise either because of system overgeneration conditions or local congestion. Most of the curtailment was of solar rather than wind resources, and therefore generally occurred in the middle of the day. Mr. Kalaskar then presented an analysis of the reduction in those curtailments that can be attributed to the energy imbalance market, which was calculated by constructing a counterfactual in which additional exports of energy from California would not have been possible in real-time. That market was particularly effective in the spring of 2016 in reducing curtailment (occasionally reducing curtailments by half or more), but less so in the autumn of 2016.

Mr. Kalaskar showed comparisons of hourly export capability in the energy imbalance market, which greatly increased with the addition of Nevada Power and Arizona Public Service to the market, to the amounts of curtailment. There was no indication that this capability was a major factor in the remaining curtailments. In the ensuing discussion, it was suggested by MSC members that a close look be given to particular constraints within the ISO's system to better understand how transmission limitations may be contributing to curtailments.

4. Financial transmission right auction design.

Mr. Perry Servedio, Sr. Market Design & Regulatory Policy Developer at the ISO, briefly summarized the experience that payouts by the ISO to transmission rights holders have been in excess of revenues received by the ISO when it auctions financial transmission rights. In response to this experience, the Department of Market Monitoring (DMM) has proposed that the ISO would no longer sell financial transmission rights that would involve obligations on the ISO's part to pay or be paid. Instead, DMM proposes that the ISO operate an auction that would, in essence, be a clearinghouse to match willing buyers and sellers of those rights. After discussing the experience with payouts and auction revenues since 2012, Mr. Servedio summarized the planned stakeholder process for determining the root causes of the issue and considering any potential proposals to resolve the issue. There was then a brief stakeholder discussion of the need for transmission rights as hedges for smaller market participants.

Dr. Scott Harvey, member of the MSC, then made a detailed presentation in which he reviewed potential questions concerning the functioning of the present transmission rights allocation and auction system that could be addressed by analysis, and what lessons might be learned that could be used to improve the system's performance.¹ He began his presentation by distinguishing between rights that are held for risk hedging reasons, which he anticipates would be sold for more than their expected payout on average, versus rights that would be acquired as financial investments, in which case the purchaser would buy them only if a positive return would be anticipated. He proposed that observed auction prices and returns be analyzed to determine which rights are being acquired for which purposes. This analysis should be based upon a reasonably long period, because of the volatility of returns, and should use data from the monthly auctions, whose returns would be less confounded by the cost of capital involved in holding rights for a period of time. The analysis should also account for charges levied on CRR holders. Based on his analyses in the New York and PJM markets, he has previously identified subgroups of hedging rights whose prices consistently exceeded their expected return.

¹ S. Harvey, "CRR Prices and Pay Outs: Are CRR Auctions Valuing CRRs as Hedges or as Risky Financial instruments?," Presentation, February 3, 2016, www.caiso.com/Documents/BriefingonAnalyzingCongestionRevenueRightsAuctionValuation-MSCHarvey-Feb2017.pdf

Dr. Harvey then proposed that if some rights are identified as being consistently priced lower than their returns that analysis be undertaken of the reasons for their being treated as financial instruments that are bought for investment purposes. These could include a lack of hedging demand (for instance, because congestion charges can be passed through to ratepayers), a lack of competition among potential purchasers of hedging instruments (for example if there is only one or a few entities who could use a particular instrument as a hedge), and modeling issues in the auction. Dr. Harvey then proposed additional focused analyses that identify whether all, most, or just a small subset of the rights are being purchased for financial investment purposes, and what the reasons are for their low valuation in the auction. Insights might be gained from examining rights that are allocated to load serving entities rather auctioned, as well as identifying whether there are particular transmission constraints that are undervalued and thus may be generating returns for rights that are held for financial reasons. Modeling issues can arise from discrepancies between the network models used in the auction and in the energy market. Reasons for discrepancies can include missing constraints, loss modeling, AC load flow issues, nodal weights used for financial rights that sink in load aggregation points, or constraints that bind in the energy market but not in the auction.

The information generated by such analyses could help identify whether the changes proposed by DMM are desirable, or whether there are other possible changes to the allocation and sale of financial transmission rights that would effectively address the general issue of auction revenues being smaller than payouts.