



# Memorandum

**To:** The ISO Board of Governors  
**From:** Frank A. Wolak, Chairman, Market Surveillance Committee of ISO  
**cc:** Yakout Mansour, President & CEO, Charlie Robinson, VP & General Counsel  
**Date:** May 27, 2005  
**Re:** *Summary of the Market Surveillance Committee Meeting of May 24, 2005*

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**This is only a status report. No Board action is requested.**

The Market Surveillance Committee (MSC) held a public meeting on May 24, 2005 at the California ISO. All MSC members were present. Brad Barber called the meeting to order and asked for public comments.

## Public Comment

Jeffrey Nelson of Southern California Edison stated that the ISO might not have the necessary economic and reliability tools to operate the California market without a must-offer requirement after June of 2006 even if all of the provisions of the California Public Utilities Commission's (CPUC) resource adequacy (RA) requirements are in place by that date. For this reason, Nelson argued that the ISO should request that the Federal Energy Regulatory Commission (FERC) maintain the current must-offer requirement for the California market until both the CPUC RA requirements and the major features of the Market Redesign and Technology Upgrade (MTRU) are in place.

Frank Wolak asked Nelson to elaborate on what problems he thought could arise if the must-off requirement was eliminated effective June 2006. Nelson said that he believed local reliability problems with managing intrazonal congestion could arise because those generation units needed to relieve congestion that did not have reliability must-run (RMR) contracts may not bid their capacity into the real-time market.

## Market Update

Doug Bergman, Senior Monitoring Analyst in the Department of Market Analysis (DMA), provided the MSC with an update on the performance of the California market during the months of March, April and May. The major theme of Bergman's presentation was that California load levels were relatively low due to mild weather, whereas supply conditions were relatively strong because of substantial hydroelectric energy availability in California. As a result, the real-time market in California has been a decremental energy market during the vast majority of hours of these months.

Bergman noted that on average more than 150 MW of uninstructed deviations have occurred during all hours of the day over the period January 1 to March 26, 2005. Much of this uninstructed energy has come from qualifying facilities (QFs) and capacity owned by municipal utilities, but an average of more than 100 MWh per hour has come from units owned by merchant suppliers and the three investor-owned utilities (IOUs) in California from energy coming from large units ramping up to their minimum run levels.

Consistent with substantial hydroelectric availability and high levels of forward contracting between Western Electricity Coordinating Council (WECC) suppliers and California load-serving entities (LSEs), Bergman noted that

the pattern of regional day-ahead electricity prices in the WECC have followed western spot natural gas prices throughout the months of April and May. Bergman also noted that ancillary services (A/S) bid insufficiency continue to be a problem in April and May. Condition 2 RMR units provide the necessary A/S when there is bid insufficiency in the A/S markets. Finally, Bergman showed that minimum load cost compensation under the ISO's must-offer requirement continues to be substantially lower than they were during the same months in 2004.

### **Western Power Trading Forum (WPTF) Letter to ISO Board**

Greg Cook, Manager of Market Monitoring for the Department of Market Analysis, discussed the Western Power Trading Forum's (WPTF) letter to the ISO Board on the 2004 Annual Market Issues and Performance Report (the Report). Cook then outlined that DMA's proposed response. Cook first noted that there was significant commonality between the Report and the WPTF letter on the current state of the California market. He also expressed appreciation to the WPTF for taking the time to provide comments on the contents of the report. He then noted that a major source of differences between the WPTF and the Department of Market Analysis was the result of the Report being primarily concerned with providing a retrospective on market issues and performance during 2004, rather than a prospective or current analysis of market performance in 2005 and into the future.

In addition, Anjali Sheffrin commented that another dimension of the difference was that the Report is an analysis of the performance of short-term energy and ancillary services markets that the ISO operates. The WPTF was concerned that there may not be adequate generation capacity in Southern California to meet this summer's demand peaks, a concern also noted in the ISO's Summer Assessment for 2005. The Report states that reserve margins declined between 2003 and 2004. The Report also stated that short-term energy and ancillary services markets should not be the primary revenue sources that would fund new generation investment. Instead, as the MSC has also argued in a number of opinions, long-term forward contracts between suppliers and California LSEs should be the major sources of revenues to fund new generation investments to serve California.

Cook also discussed the WPTF's complaints about the Report's analysis of the markup of the real-time price over the marginal cost of the highest cost unit operating in the California ISO control area. The WPTF recommended a markup measure based on the long-run marginal cost of supplying additional electricity to California. Cook stated that long-run marginal cost was an inappropriate benchmark price to use to measure short-term market performance. As has been discussed in a number of MSC opinions and reports, the appropriate measure of short-term market performance is the markup of the market price over the marginal cost of the highest cost unit operating to serve demand in that hour. The markup of price over the long-run marginal cost of supplying electricity is also not an appropriate measure of long-run market performance. The annual average spot and forward contract prices in a workably competitive wholesale market should recover the average cost of new generation capacity over the life of the asset.

Finally, Cook noted that the shift from Condition 1 to Condition 2 by a number of RMR units is not necessarily a symptom of a market that provides inadequate revenues. Instead, as noted by one MSC member this could be an indication of flawed RMR contracts that do not make Condition 2 units available to the A/S market unless there is bid insufficiency in the A/S market.

Cook's presentation was followed by a number of comments from MSC members. James Bushnell emphasized the distinction between short-term market performance in future and the long-term performance of market. The level of forward contracting between California LSEs and WECC suppliers, the extent of active demand-side participation in the wholesale market and the capacity of the transmission network within and into the California ISO control area all impact the future performance of short-term energy and ancillary services markets. The long-term performance of the California market largely depends on factors outside the control of the California ISO. The design of the RA

requirement and enforcement process by the CPUC and the methodology adopted by CPUC and California Energy Commission (CEC) for determining the location and extent of transmission expansions are the two most important factors in the long-term performance of the California market.

Brad Barber recommended that the DMA include in future editions of the Report measures of the financial health of major participants in the California market. He recommended compiling variables as the bond rating, earnings per share, and cash on hand for the parent company of the major market participants in California. While he admitted that these might be imperfect measures of the financial health of the California market participants, they do provide a general assessment of the state of the national industry.

Frank Wolak noted that measuring the long-term health of an industry was complicated by the fact that under wholesale market regime, the costs of investments that not are needed to meet demand should be borne by shareholders and employees of the company, rather than consumers, as was the case during the former vertically integrated monopoly regime. Patrick Wood, the Chairman of FERC, noted in a recent speech that the current generation downturn is being borne by shareholders and not by customers. Wood noted that he felt that this was a major source of benefits to consumers from electricity industry re-structuring. Consistent with this logic, Wolak stated that all of WECC suppliers that signed long-term contracts with the State of California during the winter of 2001 are earning very lucrative revenue streams from supplying energy according these forward contracts. All WECC suppliers had the opportunity to offer long-term contract for electricity to the state of California during the winter of 2001. Those that signed forward contracts are now selling energy at prices significantly above average short-term electricity prices. The suppliers that did not offer the state of California attractive prices for forward contracts during the winter of 2001 took the risk that a very competitive short-term energy market could arise once a significant fraction of final demand was covered by forward contracts and that this short-term energy market could produce average prices that were insufficient to recover their annual fixed cost requirements.

### **Settlement of Intertie Bids**

Eric Hildebrandt of the DMA briefed the MSC on the settlement of the intertie bids under the Real-Time Market Application (RTMA). On April 7, 2005 FERC approved the current pay as-bid mechanism to have an effective date of March 25, 2005, with a sunset date of September 31, 2005. The ISO has implemented a stakeholder process to assess various "medium term" options to be implemented between September 31, 2005 and February 2007 when MRTU is expected to be in place. Long-term options for the settlement of interties under MRTU will be discussed as part of the Hour Ahead Scheduling Process (HASP). On May 7, 2005 the ISO filed a request for clarification/rehearing on the Amendment 66 decision that approved the current pay as-bid mechanism for settling interties. In this filing, the ISO informed FERC that a pre-dispatch market-clearing price solution—the ISO's Option 1--could not be implemented until Spring of 2006, approximately 1 year before the HASP/MRTU. The ISO also requested clarification on whether pay as-bid could be considered as a medium term option until MRTU was implemented. On May 20, 2005 FERC ruled that pay as-bid could be considered as an option. However, it also ruled that if the ISO did not propose an acceptable medium term solution, the current pay as-bid mechanism would be replaced by the previous bid-or-better mechanism.

Hildebrandt then presented the options currently under consideration by the ISO. He presented a detailed discussion of a proposal by the Bonneville Power Administration (BPA) that would pay bid-or-better for energy purchased to meet the ISO's projected demand and a market-clearing price to clear overlapping bids. Ben Hobbs expressed concern about the unintended consequences of this solution. He also questioned the efficiency properties of this solution relative to the other proposed solutions. Hildebrandt then described the two major options being considered by the ISO. Option 1 would set pre-dispatch market-clearing prices that all tie bids would be

settled against. Option 2 could continue the current pay as-bid mechanism. Hildebrandt then asked for the MSC's recommended option.

Frank Wolak stated strong support for the current pay as-bid mechanism until the MRTU was implemented in February 2007. He provided a number of arguments for this recommendation. First, he did not believe the inefficiencies associated with a pay as-bid market for interties were particularly large given that the ISO was, for the most part, the only net buyer of energy in this market. He also suggested a number of analyses that the DMA could use to quantify the magnitude of these inefficiencies. In particular, he suggested that the DMA study the form of the aggregate bid curve submitted at all of the interties by importers. To the extent that these bid curves were extremely flat, the inefficiencies of a pay as-bid market were likely to be very small. Wolak also felt that those suppliers that wished to earn a market-clearing price under Option 2 could do so by dynamically scheduling into the ISO's real-time market. Several major importers are already doing this. Wolak urged the ISO to continue to encourage more importers to do this. Wolak did not believe that it made much economic sense to divert scarce financial resources from the MRTU process to implement to Option 1, given that it would only be in place for approximately one year. Even if one conceded that Option 1 (the market-clearing pre-dispatch price option) was more efficient, the significantly larger fixed cost of implementing Option 1 and the one year horizon over which these costs would have to be recovered was insufficient to justify moving forward with Option 1 as opposed to Option 2. For all of these reasons, Wolak argued that the most prudent medium term solution was Option 2. James Bushnell then expressed support for Option 2 over Option 1 for similar reasons.

### **Market Power Mitigation under MRTU**

Jeff McDonald of the DMA presented a number of MRTU Market Power Mitigation issues for resolution. His presentation focused on three issues: (1) criteria for assessing whether to raise the energy bid cap under the proposed transition plan in the MRTU conceptual filing, (2) criteria and methodology for determining competitive transmission path designations, and (3) methodology and criteria for assessing the competitiveness of A/S procurement regions.

McDonald stated that three factors would be used to assess whether to raise the energy bid cap: (1) the extent of competition in the short-term energy market, (2) extent of forward contract coverage by LSEs, and (3) extent that final consumers are exposed to real-time wholesale price signals. He proposed to base the assessment of the competitiveness of the short-term energy market on a prospective residual supply index (RSI) analysis. A prospective RSI would be computed using forward-looking system conditions for each hour over the coming year. These hourly RSI values would then be compared to a historical competitive threshold to determine whether the frequency the RSI values exceeded this threshold was sufficiently low to merit declaring the short-term energy market workably competitive. McDonald posed several questions about what types of forward contracts should count in the forward contract showing and what types of demand response programs should count.

There were several comments from members on the MSC on these questions. First, Frank Wolak emphasized that fixed-price forward contracts for energy should be the standard against which all of these contracts are compared. He felt that tolling arrangements could be counted if the LSE could demonstrate that it had hedged the natural gas or other input fuel price risk in a fixed-price forward contract. Forward contracts indexed to the spot price of electricity or natural gas should not be counted as adequate protection against spot price risk. Only demand-side programs that expose final consumers to real-time price risk should be counted. Time-of-use pricing tariffs should not be counted because these retail prices do not vary with real-time system conditions. Critical-peak pricing programs or load curtailment programs that require consumers to reduce their consumption based on economic criteria should count as hedges against spot price risk. There was some debate among the members of the MSC

as to how to count demand-side involvement, although all members agreed that final demand paying the short-term energy price was an effective hedge against short-term price risk for the LSE.

McDonald then discussed the issue of assessing the competitiveness of transmission paths. He recommended using the RSI metric to determine the competitiveness of the market to relieve congestion on a transmission path. He raised a number of issues associated with implementing this proposal. Several MSC members questioned the competitive transmission path approach and instead advocated an approach that looked at the competitiveness of local energy market. They felt this distinction was particularly important in a looped transmission network such as the one that exists in California. Moreover, because the ISO will be using a full network model under the MRTU market design, focusing on the locational energy market seemed to make much more sense. Both James Bushnell and Frank Wolak recommended using a residual demand based approach to assessing the competitiveness of locational energy markets.

McDonald then discussed a proposed RSI-based methodology for assessing the competitiveness of A/S procurement regions. This proposal would lower the bid cap for A/S to \$100/MW in any region that did not meet the definition of a competitive region in a pre-specified percent of hours. Frank Wolak questioned the extent to which both system-wide and locational A/S needs had been re-considered in setting the ISO's A/S requirements under MRTU, given the ISO's experience since the summer of 2001 with must-offer requirement. As has been noted in during a number of MSC meetings, the ISO operators appear to use the must-offer waiver denial process to obtain energy and ancillary services at locations in the ISO control area that are not paid as ancillary services. The must-offer waiver denial process often yields substantially more unloaded generation capacity than the minimum 7 percent reserve requirement on a system-wide basis. Wolak asked whether the MRTU design process and market power mitigation mechanism had considered whether the ISO needed for than 7 percent reserves a system-wide basis or at certain locations in the network. Wolak stated that to the extent the ISO operators need more than 7 percent reserves they should purchase these reserves in the A/S markets. He stated that an explicit recognition of actual operating constraints for reserve and energy purchases, rather than a strict adherence to the 7 percent reserve requirement despite the fact that more reserves are actually needed by the operators will make it much easier for the ISO to design an effective local market power mitigation mechanism for both energy and A/S.

James Bushnell then made a presentation outlining of how residual demand analysis could be used to assess the competitiveness of short-term energy markets, local energy markets and regional and system-wide ancillary services markets. By combining the algorithm used to compute market prices, estimates of the generation unit-level marginal cost curves, and the level of system demand, the residual demand curve facing any supplier can be computed for any set of system conditions. The slope of this residual demand curve in the neighborhood of the expected output level for the firm quantifies the ability of this market participant to raise market prices. Residual demand curves can also be computed on a historical basis using the actual bids submitted by all market participants. Wolak (2003) performs such an analysis for the real-time market across the summers to 1998, 1999 and 2000 to demonstrate the tremendous increase in the slope of the residual demand curves faced by the major California suppliers during the summer of 2000 relative to the summers of 1998 and 1999.<sup>1</sup> This is one advantage of bid-based wholesale electricity markets relative to the market for other products where the analyst only observes market-clearing prices and quantities, instead of the willingness to supply and consume electricity of all market participants for all possible market prices.

Bushnell's presentation was followed by a discussion of the how the ISO could gather the necessary data to validate the forward contract obligations of major suppliers to the California market. Frank Wolak emphasized that it is extremely difficult, if not impossible to gather information on the forward contract holdings of major suppliers

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<sup>1</sup> Wolak, Frank A. (2003) "Measuring Unilateral Market Power in Wholesale Electricity Markets: The California Market 1998 to 2000," American Economic Review, May 2003, 425-430.

because the opportunities for affiliate transactions allows firms to undo forward contract position within the parent company. The extreme difficulty California parties had verifying the forward contract positions of the major California suppliers during the summer and autumn of 2000 illustrate this point. Consequently, Wolak argued that the relevant variables to collect are the forward contract holdings of the major LSEs in California. This would quantify the extent of protection these LSEs have from spot price risk. Collecting this information from the LSEs requires the CPUC to request this information. The DMA could assist the CPUC in devising the reporting requirements and reporting frequency. In particular, DMA could specify the level of granularity in the data collected on the type and duration of the contracts. Similar to the case of forward contract holdings, CPUC involvement is essential to gathering the necessary information on the extent of participation of final demand in the wholesale market. Once again, the DMA can assist in defining the reporting requirements for LSEs and the product categories that should be used to collect the information.

The discussion then turned to what was the necessary portfolio of forward contracts and demand-side involvement necessary to raise the bid cap on the short-term energy market. Several MSC members offered recommendations for determining these minimum portfolio levels.

### **CCR Allocation Mechanism**

Lorenzo Kristov of the DMA updated the MSC on the Congestion Revenue Right (CRR) allocation process. He first presented a number of proposed objectives for the CRR allocation process. The first objective was that CRRs should be allocated according to the actual or expected use of the transmission network by a market participant. Kristov also stressed that the allocation should also be consistent with revenue adequacy and it should be based on market participant choice. Any reduction in a party's requested CRR allocation should be performed in an equitable fashion.

These allocation objectives triggered a number of comments from MSC members. James Bushnell emphasized that the CRR allocation should not be based on a market participant's desired use of the transmission network. He stated that such an allocation mechanism could cause LSEs to source their energy needs from locations in the transmission network that are unlikely to be deliverable in order to receive very lucrative CRRs. Frank Wolak noted that in many instances it is extremely difficult to determine the historical use of the transmission network by a specific market participant, particularly given the current zonal market design. Allocating CRRs based on a market participants generation holdings and the locations of its loads was a reasonable approach to determining historical use, but this would leave many CRRs unallocated. Wolak also noted that because CRRs refund the congestion revenues collected by the ISO, a profit-maximizing firm's goal in the CRR allocation process is to maximize the amount of ex post congestion revenues it collects from its CRR allocation, having nothing to do with its historical use of the transmission network. For example, if one CRR allocation request yields the market participant 20 percent of the congestion revenues and another yields 15 percent, the market participant can be expected to make the first request to the ISO, regardless of its historical use of the network.

Because of the above logic, Wolak emphasized that the CRR allocation mechanism should focus attaining a consensus from market participants on what constitutes a "fair" allocation mechanism, rather than attempt to measure historical use of the transmission network. Wolak suggested one potential "fair" allocation mechanism would be to first determine a total quantity of CRRs on each transmission path that maximizes the total congestion revenues that the ISO expects to refund and then allocate each load-serving entity its total ISO load-weighted share of each CRR. For example, if an LSE had a 10 percent annual share of total ISO load, it would receive 10 percent of the CRRs allocated on all transmission paths. Market participants would then be free to trade these CRRs among themselves in the informal bilateral market or in a formal CRR auction operated by the ISO.

## Resource Adequacy Process at CPUC

Eric Hildebrandt of the DMA described the progress of the CPUC RA proceedings. He discussed the distinction between the top down and bottom up approach to capacity adequacy. Hildebrandt emphasized that the CPUC RA process focused on procuring adequate generation capacity, not procuring adequate energy and ancillary services to meet the LSE's future energy and ancillary services needs.

Frank Wolak strongly urged the ISO to focus the primary goal of the resource adequacy process on preventing a repeat of the events of June 2000 to June 2001. He noted that a 115% to 117% capacity reserve margin would not prevent a future crisis, for the simple reason that there is no evidence that inadequate generation capacity to serve demand led to the crisis during the period June 2000 to June 2001. All of the rolling blackouts occurred during the trough of the annual demand cycle when peak demand on system was less than 34,000 MW, versus more than 45,000 MW during the summer months. The lack of fixed-price long-term contracts for energy between suppliers and California's major LSEs that committed suppliers to provide energy to California was the major cause of the crisis. Suppliers earned the spot price for virtually all of the energy they sold in California, which gave them very strong incentives to raise spot prices.

Wolak stated that having adequate capacity to meet demand is a very weak necessary condition for ensuring that suppliers are willing to provide energy to California consumers at reasonable wholesale prices. This necessary condition is particularly weak for the WECC where a substantial fraction of demand is met by hydroelectric energy. Wolak emphasized the need for an even greater larger fraction of final demand to be covered by fixed-price forward contracts in regions where a substantial fraction of energy is provided from hydroelectric resources. Enough fixed-price forward contracts between suppliers and California's LSEs provide a contractual guarantee that a future crisis will not occur. Wolak then emphasized that a capacity-based RA paradigm does not address the problem of the financial viability of LSEs, because without adequate levels of forward contracts, the LSE still faces a significant risk of extremely high wholesale electricity prices for a long enough period of time to bankrupt it.

Wolak acknowledged the need for the ISO operators to have generation units in the control area at locations necessary to meet demand. However, he emphasized that purchasing energy at the locations in the network where the LSEs actually withdraw this energy from the network is a superior strategy for ensuring that the generation units would be constructed in the appropriate locations to meet demand and satisfy the requirements of the ISO operators.

Following this presentation there was a discussion of these issues among members of the audience and members of the MSC. The generation conclusion that emerged was that the MSC urged the ISO and CPUC to focus on purchasing adequate energy in far enough in advance of delivery (to obtain a price that reflects little system-wide market power) with guarantees that the capacity necessary to provide this energy will be built, rather than focusing the resource adequacy process on purchasing generation capacity that may not have sufficient energy available to meet demand.

Brad Barber adjourned the public meeting at 3:15 pm. The MSC met in executive session until 5:30 pm to discuss specific market participant bidding behavior under the current pay as-bid settlement for interties and market participant bidding behavior throughout the control area under tight supply conditions.