

**UNITED STATES OF AMERICA  
BEFORE THE  
FEDERAL ENERGY REGULATORY COMMISSION**

Investigation of Terms and Conditions of Public )      Docket No. EL01-118-000  
Utility Market-Based Rate Authorizations      )

Electricity Market Design and Structure      )      Docket No. RM01-12-000

**California Independent System Operator Corporation Department of Market  
Analysis Comments Regarding the Federal Energy Regulatory Commission’s  
Proposed Market-Based Rate Standard and Mitigation Mechanism**

The California ISO Department of Market Analysis (DMA) has evaluated the Supply Margin Assessment (SMA) screen and the related mitigation mechanism contained in FERC’s November 20, 2001 “Order on Triennial Market Power Updates and Announcing New, Interim Generation Market Power Screen and Mitigation Policy.”<sup>1</sup> This new test only applies to suppliers who are not part of a formal ISO/RTO. Suppliers who are part of an ISO would continue to possess market-based rate authority because it is assumed that the ISO should have sufficient market power mitigation measures already in place. After issuing this proposal, FERC has suspended applying it due to a flurry of criticism raised by generators that such a test creates uncertainty for new investment.

The proposed SMA test is similar to the residual supplier index (RSI) analysis that the DMA has used for the last two years to assess a supplier’s potential ability to exercise market power. Under such an analysis, if a supplier is pivotal during the annual peak hours, i.e., without its supply the market demand cannot be met, the supplier will fail the SMA screen. The Order further proposed that any supplier who failed the SMA screen for the peak hour would not be granted market-based rate authority and would be subject to mitigation in the spot market.

The DMA welcomes the proposed standard and mitigation for market-based rates as a first step forward in the process of addressing the serious flaws in the existing standard for granting market-based rate authority. However, while we believe a new screen for granting market-based rate authority is critical, more importantly, FERC must establish an explicit standard for just and reasonable rates on which to measure all market outcomes and specify prospective mitigation measures to be put in place if market outcomes surpass the just and reasonable standard.

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<sup>1</sup> FERC Docket: ER96-2495-015.

In analyzing the FERC's proposed SMA screen and mitigation mechanism, we found the following deficiencies:

- ?? The proposed screen and mitigation only applies to suppliers who are not part of a formal ISO/RTO. Suppliers who are part of an ISO would continue with market-based rate authority because it is assumed that the ISO should have sufficient market power mitigation measures already in place. The results in the California market in 2000 and 2001 clearly illustrate that this is not always the case. The experience in California over the past two years demonstrates the need for effective market power mitigation inside an ISO/RTO. Although all suppliers participating in ISO's markets passed the current market-based rate screen, DMA and FERC found that tremendous market power plagued the market from May 2000 to June 2001.
- ?? The SMA screen may not be sufficient since it does not consider the need for regulation service and operating reserve requirements for a control area, which is typically 6-10% above the peak load. Due to the additional need for operating reserves, a large supplier can be pivotal for many hours of the year even if it passes the SMA screen. The SMA screen also ignores the possibility of collusion and consideration of the net position of a supplier (net of load obligation) in benefiting from higher prices.
- ?? The proposed mitigation for suppliers who fail the SMA test is inadequate and can be easily circumvented. It only works when there is available competitive supply in the market to exert pressure on the dominant suppliers, which is not true during period of tight supply. Therefore, the mitigation will fail during the hours when it is most needed.

A detailed discussion of the deficiencies mentioned above is provided in the attached Appendix. The remainder of the paper is organized as follows: First, a discussion of why a clear just and reasonable rate standard is needed and proposal for a 12-month rolling price-cost markup index as a benchmark for this standard. Second, we outline an alternative screen to be used for market-based rate authority. Finally, we outline some alternative mitigation mechanisms that should apply to suppliers who fail a market-based rate screen.

## **I. Standard of Just and Reasonable Rates: 12-month Rolling Price-cost Markup Index**

Before discussing the specific provisions of the FERC proposal for SMA and mitigation mechanism, it is important to emphasize the need for a clear standard of just and reasonable rates. As stated earlier, a standard for just and reasonable rates is critical for assessing market performance and to be able to evaluate the effectiveness of the process of granting market-based rates. The Federal Power Act established a clear mandate for FERC to ensure and enforce just and reasonable rates. Limiting the authority to charge market-based rates is just one instrument to realize the goal of the just and reasonable rate standard, but the effectiveness of this instrument must be measured by a specific

standard. Currently, there is no clear standard on just and reasonable rates. Therefore there is no assurance that any proposed method for granting market-based rates will produce just and reasonable rates as required by Federal Power Act.

The CAISO has proposed a simple and practical test for measuring just and reasonable market outcomes. It is based on a 12-month rolling price-cost markup index that measures the extent that market prices remain above a competitive benchmark for a moving 12-month period. The CAISO proposes that an effective standard for this index would be for the index to be allow no more than \$5/MWh mark-up in all hours for market outcomes to be considered just and reasonable.

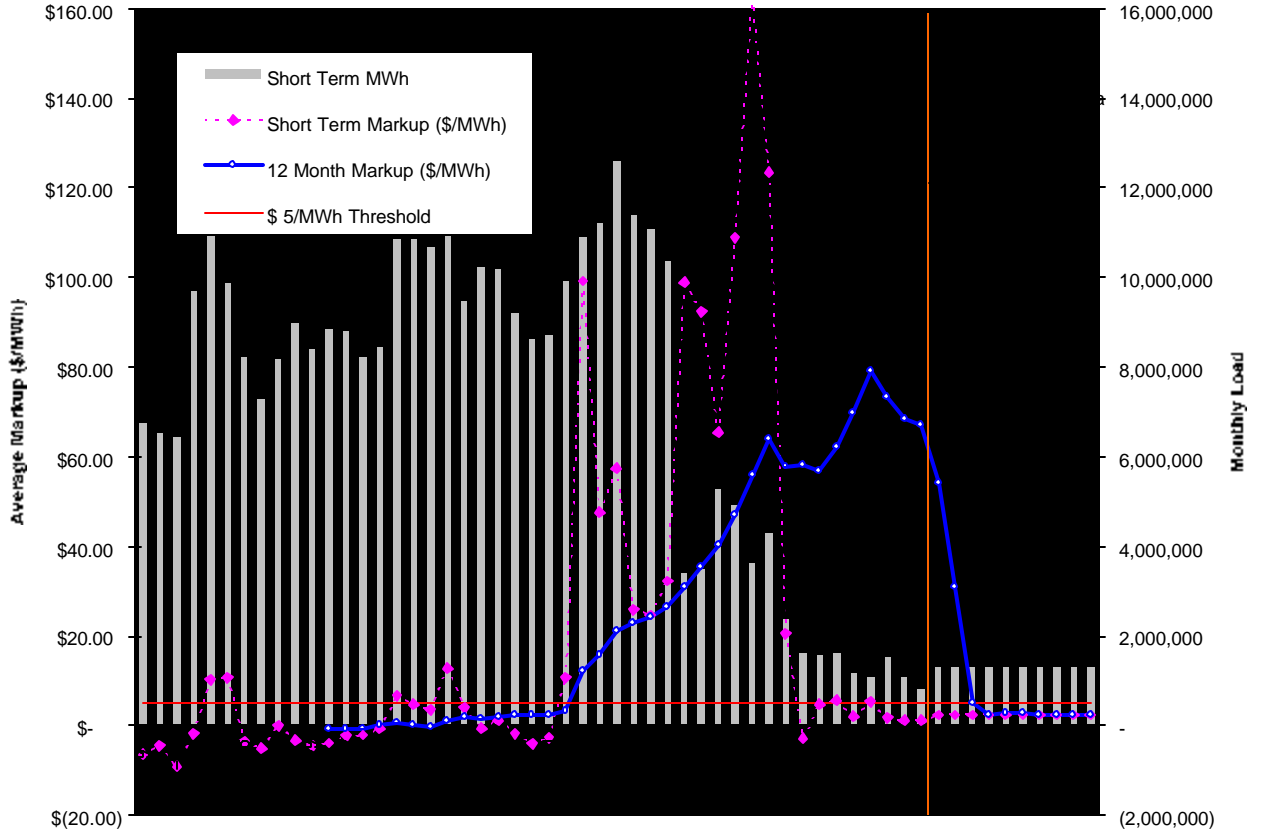
The actual 12-month rolling total market cost is calculated as the hourly market price multiplied by hourly demand and accumulated into 12-month totals. The benchmark is market cost under competitive conditions, estimated as the hourly system marginal cost multiplied by the hourly system demand and accumulated into a 12-month total. If the 12-month price/cost markup exceeds the \$5/MWh mark-up, the FERC should immediately implement a prescribed set of mitigation measures. Such a clear standard for action would eliminate concerns that the Commission might not intervene in a timely manner and would also signal when prices would be subject to refund on a prospective basis. Thus, under this proposal the FERC would no longer allow systematic bidding at un-competitive prices. This proposed methodology is *prospective* and easy to calculate. One important feature of this approach is that infrequent price spikes would not necessarily mandate action, but significant deviations on a sustained basis would.

This approach could have averted much of the damage from the California power crisis in 2000. The figure below shows that during the first two years of competition in California power markets, market costs were no more than 7 percent above an effective competitive market outcome, even though there were occasional price spikes as high as \$9,999. In May of 2000, after repeated price spikes, the rolling average cost of electricity surpassed the allowable \$5/MWh mark-up above an effective competitive market outcome. If the proposed standard had been in place, mitigation measures would have been implemented at this time. A focus on a 12-month rolling averages filters out the occasional price spikes but still sets specific thresholds to identify unjust and unreasonable rates. Without an explicit standard, the California consumers have had to endure monthly deviations between the rolling average cost of electricity and an effective competitive market outcome of 40% or more.

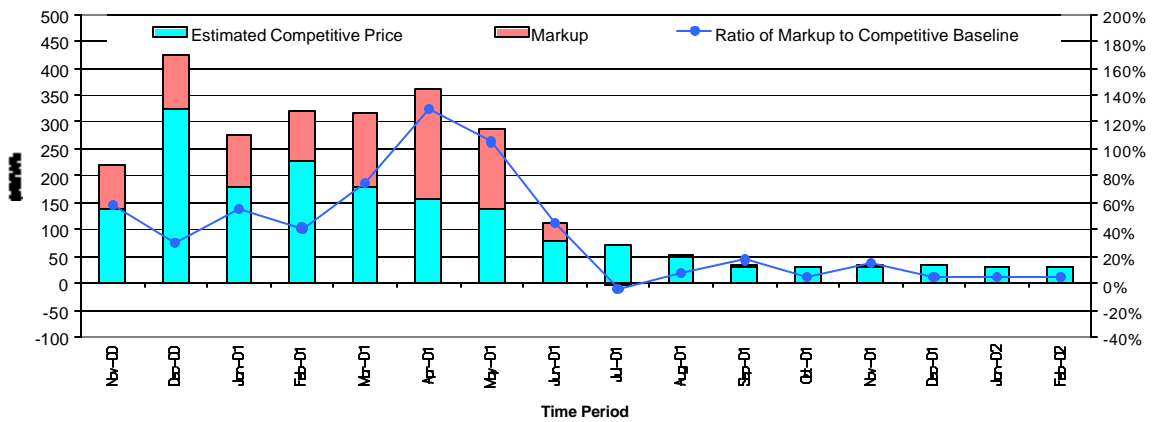
A clear standard for just and reasonable rates provides certainty and confidence for all market participants. Consumers would know the level at which regulators would intervene to prevent market abuse. Power suppliers would be aware of when mitigation would be triggered and would have the ability to self regulate their bidding practices in order to avoid regulatory intervention, and the FERC would have an objective standard to know when to step in. The following chart illustrates an example of the 12-month rolling index applied to the California market since start-up (April 1998 to February 2002). As shown, such a standard would have alerted all parties (consumers, suppliers, and regulators) that markets had become uncompetitive in May 2000. Once the market is

declared uncompetitive, the CAISO would implement *pre-authorized market power mitigation measures* such as the west-wide measures provided in the June 19, 2001 FERC order.

### California Market Performance Under a 12 month cumulative index using a \$5/MWh threshold



### Monthly Price-Cost Markup in Short-Term Energy (Day Ahead and Real-time)



The top chart shows both monthly price-cost markup index applied to the California market experience from April 1998 to February 2002 and the 12-month rolling price-cost markup index. The bottom chart shows in dollar values of the monthly average competitive market benchmark and the actual market prices.

## II. Market-Based Rate Standard: RSI Screen

The RSI index used by CAISO provides more information than the FERC proposed SMA screen. It can be applied to *all* hours in which the supplier provides service and is eligible to earn revenues based on granted market-based rate authority. It also incorporates actual market outcomes and measures the ratio of the residual supply to the actual demand. It does not calculate a simple pass or non-pass statistic for one peak hour. The additional market information provides us a better understanding of whether market power is being exercised in all hours.

RSI can be defined for the entire market or for any specific suppliers.<sup>2</sup> It is the ratio of the residual supply (total supply minus the capacity of the supplier in question) to the system demand (which is load plus reserve, and equals to 1.1\*load in CAISO).

$$RSI_s = \text{Residual Supply (s)} / (1.1 * \text{Load})$$

Both residual supply and load change from hour to hour. Load changes the most across month and hours of the day. Supply capacity is more constant, but can fluctuate due to outages. As a result,  $RSI_s$  changes from hour to hour.

Using the above definition, a RSI screen can be applied as follows (specific numbers used here are examples for discussion purpose only):

$RSI_s$  should not be less than 110% for more than 5% of the hours in a year (438 hours)

where  $RSI_s$  is the measure of RSI for the supplier under review

When RSI is significantly above 100%, there is sufficient competition in the market even if the supplier S withholds all of its capacity. When RSI is less than or slightly above 100%, the largest supplier or suppliers would be able to exercise market power through physical or economic withholding. Using three years of market data from the CAISO, we found that when RSI is about 120%, the average price-cost markup is close to zero. Therefore, our proposed screen for market-based rate authority requires that the hours with high risk of market power problems account for no more than 5% of the hours in a

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<sup>2</sup> For the entire market, the RSI is defined as the RSI for the largest supplier.

year. Using this screen, not all hours in a year have to be competitive, but the overall annual market performance is likely to be workably competitive.

This proposal has the following advantages compared to FERC's proposed SMA:

- ?? The RSI considers only net capacity of the supplier (after accounting for their obligation to serve load) in determining whether it is pivotal, and therefore becomes more selective in identifying the suppliers who have the incentive to exercise market power. The net capacity is the total capacity minus capacity committed to serve load under long-term fixed-price contracts. A supplier does not include capacity under fixed-price contracts when determining optimal bidding strategy. Another exception is that a supplier could be a net buyer, and therefore would not have the incentive to exercise market power. The RSI measure allows consideration of these important factors.
- ?? The RSI threshold would apply to all hours and would use a standard where the RSI could be below 110% for more than 5% of the time. This is a higher threshold than the SMA, which uses 100% for only the peak hour. This wider threshold allows us to examine all hours, consider the potential for collusion and include operating reserve requirements in the RSI calculation.
- ?? The RSI standard also allows the threshold to be exceeded for a limited number of hours in a year, to leave room for price fluctuations that reflect actual market demand and supply conditions. It would send signals for conservation and new investment in generation.
- ?? The RSI framework can be used as a tool to forecast price markup outcomes for a market that is based on an empirically derived relationship between RSI and prices. This can be important in forecasting residual market power under a variety of circumstances such as upgrading transmission lines, the impact of new entry, etc.
- ?? The RSI screen can be adjusted based on actual market experience. The 5% of hours threshold can be increased or decreased, if there is too much market power or too much mitigation. By simply adjusting the percent of hours that RSI can be below 110%, the regulator can fine-tune the screen for each market to best achieve the competitive market outcome.

The DMA has tested the proposed criterion for large suppliers in the CAISO market. During 2000 (base year of our study), all suppliers failed the RSI screen. Their RSI was less than 110% for about 20% of the hours. This is significantly above the 5% threshold.

We also looked at a projected competitive market condition (which is approximated based on our recent report on reserve margin and workable competition). In that case we assumed that an additional 5,050MW of new generation capacity owned by suppliers who have fully contracted their output to load. This is likely to produce a workably

competitive market outcome (annual price-cost markup less than 10%). Under these projected market conditions, some of the large suppliers in CAISO would have a RSI below 110% for no more than 5% of the hours, the rest are just slightly more than 5% of the hours. This provides evidence that a 5% threshold of low RSI hours provides a meaningful screen for a market-based rate standard. The following table shows the number of hours when RSI is below 110% for the base year and the projected condition for the five largest non-utility suppliers in California. The second table shows the corresponding results of RSI screening.



**Table 1a. Number of Hours when RSI <= 110%**

	Hours in Base Year 2000	% of Hours	Hours with 5,050 MW more capacity	% of Hours
S1	2044	23.3%	521	5.9%
S2	1712	19.5%	375	4.3%
S3	1922	21.9%	459	5.2%
S4	1980	22.6%	479	5.5%
S5	1825	20.8%	401	4.6%

**Table 1b. RSI screening results**

	Base Year 2000		With 5,050 MW new capacity fully contracted to load	
	% of Hours	RSI Screen	% of Hours	RSI Screen
S1	23.3%	Fail	5.9%	Fail
S2	19.5%	Fail	4.3%	Pass
S3	21.9%	Fail	5.2%	Fail
S4	22.6%	Fail	5.5%	Fail
S5	20.8%	Fail	4.6%	Pass

DMA also applied the SMA screen to the large suppliers in CAISO market. For Year 2000 conditions, they all failed the test. For the projected competitive market conditions (with 5,050MW of new capacity which is fully contracted to load), they all passed with a large margin.

If we were to use the FERC SMA screen, the system only needed about 2000 to 3000 MW of new competitive capacity for the large suppliers to pass the SMA test, which is too optimistic. The main reason for this implausible result is that SMA does not consider the 10% reserve required on top of load. That makes the suppliers pivotal at a much lower load level. The last scenario presented in Table 2 redefined the system supply margin to include the 10% operating reserve requirement. As a result, all suppliers failed the SMA screen by a significant margin. The SMA screen seems to be overly restrictive with this modification, because it requires a supplier to be non-pivotal for all hours. In comparison, the RSI screen passed some suppliers in the projected market and the remaining suppliers show a small deficiency.

**Table 2. SMA screen under different market conditions and reserve requirement\***

	Base year condition		With Additional Capacity (owned by competitive suppliers or contracted to load)		With Additional Capacity (owned by competitive suppliers or contracted to load) 10% op. reserves	
Annual Peak Load	45208		45208		45208	
Total Supply	46295.34		51345.34		51345	
System Supply Margin	<b>1087.34</b>		<b>6137.34</b>		<b>1617</b>	
<b>Supplier's Capacity</b>						
S1	3926		3926		3926	
S2	2824.8		2824.8		2824.8	
S3	3299.84		3299.84		3299.84	
S4	3507.5		3507.5		3507.5	
S5	2987.6		2987.6		2987.6	
<b>Supply Margin - Supplier's Capacity, and SMA test results</b>						
S1	-2838.66	Fail	2211.34	PASS	-2309	Fail
S2	-1737.46	Fail	3312.54	PASS	-1208	Fail
S3	-2212.5	Fail	2837.5	PASS	-1683	Fail
S4	-2420.16	Fail	2629.84	PASS	-1891	Fail
S5	-1900.26	Fail	3149.74	PASS	-1371	Fail

\*Additional capacity (owned by competitive suppliers) is assumed to be 5050MW which is based on the study of the relationship between supply margin and market competitiveness.

### **III. Market Power Mitigation Measures**

The focus of market power mitigation should be on establishing a market structure that includes:

- ?? Setting a standard for just and reasonable rates and reviewing market outcomes for adherence to this standard,
- ?? Providing strong incentives for development of price-responsive demand programs,
- ?? Encouraging voluntary long-term contracts, and
- ?? Ensuring adequate resource availability to serve the load, such as the Available Capacity Requirement proposed in Market Design 2002 by CAISO.

During periods when structural flaws continue or resurface, and the market outcome is not just and reasonable, mitigation may be needed. For a supplier who fails the market-based rate screen, we propose the following alternative mitigation. These alternative measures can avoid some of the problems with the spot market mitigation proposed in the FERC plan:

**Measure 1.** Use long-term contracts to cure highly pivotal suppliers causing an excessive RSI (greater than 110%)

A supplier would be allowed to sign long-term fixed-price contracts to cover a sufficient proportion of its available capacity to reduce its net capacity earning market-based rates and correct for excessive RSI. The long-term contracts should be subject to FERC review for just and reasonable rates. FERC should reserve the power to set the rate based on cost of service if the contract rate is not deemed just and reasonable. If sufficient long-term contracts are signed and the supplier subsequently passes the RSI screen, the supplier will not be subject to any further mitigation.

For example, a large supplier has 5,000MW of available capacity. The RSI for this supplier is higher than 110% for 400 hours in a year. This supplier will fail the RSI screen and will have market power for too many hours. If the supplier signs a long term contract to commit 3,000MW of its available capacity, its RSI (now based on 2000MW of net capacity) will be higher than 110% for only 30 hours in a year (the figure in this example is hypothetical for illustration purpose only). Consequently, the supplier can pass the RSI screen with additional long-term contracts.

**Measure 2.** Spot market mitigation

If a supplier fails the RSI screen and fails to cure the excessive RSI with long-term contracts, then spot market mitigation will be applied to all sales including bilateral trades in the spot market. This is similar to FERC's proposal. Due to the deficiencies mentioned earlier in this paper, the current FERC proposal should be modified to require a mitigated supplier offer their available supply at marginal cost subject to verification and refund if they inflate marginal cost.

A mitigated supplier must post all its available capacity on its web page for sale, and the offer price must be justified by its actual cost of generation. FERC's proposed method of posting decremental bids is not effective; a requirement of justifying offer price by cost will make the spot market mitigation meaningful.

## Appendix: Details on the Potential Deficiencies with the SMA and Mitigation

There are three critical deficiencies with FERC's proposed SMA screen:

- ?? **Consideration of net position:** A supplier's market power depends on the net capacity or net position of the supplier rather than the total capacity. The net capacity is total capacity minus load serving obligation and other long-term fixed-price contracts. If a supplier has a small amount of net capacity, it is less likely that it is pivotal. Sometimes, companies with a large amount of generation are actually net buyers (for example, the utility company Southern California Edison). As net buyers in the market, such companies usually do not have incentive to exercise market power. Therefore, the proposed standard must consider this factor.
- ?? **Operating reserve requirement:** In the FERC Order, the demand in a market area is considered to be its peak load. In actual operation, however, all control areas require some level of operating reserves. Typically, the reserve level is set at about 7% of actual load or the largest single contingency to ensure system reliability. Since this is part of required system resources, it should be included as part of the demand. The capacity surplus formula should be, assuming the reserve requirement is 7%,  $\text{Total Available Capacity} - \text{Area Peak Load} * 107\%$ . The proposed inclusion of operating reserve will make the test more sensitive and better in identifying suppliers with potential market power. When considering operating reserve requirement, large suppliers will become pivotal at lower load levels. They can exercise market power more often and at a higher level. Therefore the correct market-based rate measure must consider this factor to accurately identify all suppliers with market power.
- ?? **Consideration of possible collusion among suppliers:** Even if SMA ensures that a supplier is not pivotal, it does not rule out two or more large suppliers combining to become pivotal in the market. Economic theory and market experience indicate there can be implicit collusion among suppliers. Therefore the proposed SMA is an incomplete standard for granting market-based rate authority to sellers.

Serious limitations of the proposed spot market mitigation will make the measure mostly ineffective. This is because the proposed spot market mitigation can only be effective under the following conditions:

- ?? The decremental cost value must be closely tied to the incremental cost value. That is, if the large supplier inflates the incremental cost data, it must have comparable decremental cost data.
- ?? There must be excess capacity from competitive suppliers in the market. Because the only threat to inflated decremental cost comes from supplier with lower cost supply available.

?? As a further extension of the second condition, suppliers must not collude with each other with or without expressed communication. If suppliers manage to collude in some form, no one will step forward to offer lower cost supply that may help keep the large supplier from inflating the incremental cost.

Therefore, the proposed spot market mitigation will not be effective unless FERC mandates truthful posting of incremental cost. FERC must demand full reporting of the suppliers and conduct periodic audits of the posted marginal costs to ensure that they are justified by the underlying actual historic costs. For this purpose, FERC needs to develop a method for estimating marginal cost of generation and require suppliers to use that method.



April 24, 2002

The Honorable Magalie Roman Salas  
Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, DC 20426

**Re: Investigation of Terms and Conditions of Public Utility Market-Based  
Rate Authorizations, Docket No. EL01-118-000, and Electricity  
Market Design and Structure, Docket No. RM01-12-000**

Dear Secretary Salas:

Enclosed for electronic filing please find the California Independent System Operator Corporation Department of Market Analysis' "Comments Regarding the Federal Energy Regulatory Commission's Proposed Market-Based Rate Standard and Mitigation Mechanism" ("Comments") in the above captioned dockets. The Comments are being served on parties in accordance with the Commission's Regulations.

Thank you for your assistance in this matter.

Respectfully submitted,

Anthony J. Ivancovich  
Counsel for The California Independent  
System Operator Corporation