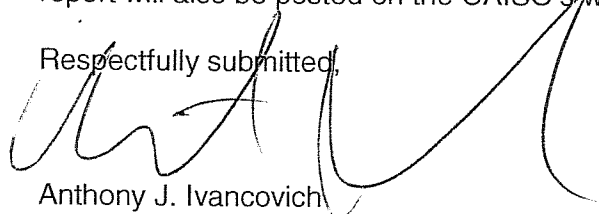August 1, 2008

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street N.E.
Washington, DC 20426

Re: **California Independent System Operator Corporation, ER02-1656**

Dear Secretary Bose:

The California Independent System Operator Corporation ("CAISO") hereby respectfully submits for filing an original and fourteen copies of a report on the performance of the Automated Mitigation Procedures ("AMP") covering the fourth quarter of 2007 and the first two quarters of 2008. This report is being submitted in accordance with the directive in the Federal Energy Regulatory Commission's ("Commission") July 17, 2002 Order, *California Independent System Operator Corporation,* 100 FERC ¶ 61, 060 (2002) (the "Order").   Please return one file-stamped copy of the report to the CAISO in the enclosed, self-addressed return envelope. The report will also be posted on the CAISO's website at http://www.caiso.com.

Respectfully submitted,

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As directed by the Federal Energy Regulatory Commission ("Commission") in its July 17, 2002 Order,[1] the ISO has prepared this Report on the Performance of the Automated Mitigation Procedure (AMP), covering the fourth quarter of 2007 and the first two quarters of 2008. AMP, proposed by the ISO in its May 1, 2002 Market Redesign 2002 filing, was approved by the Commission with modifications in the July 17 Order. This report provides an accounting of AMP activity for the subject period.

Description of AMP

AMP is an automated procedure designed as part of the ISO's real-time market dispatch software. It was intended to limit the ability of suppliers of energy in the real-time market to exercise market power by offering energy at prices well in excess of production costs. In short, AMP is a three-step algorithm that runs approximately 53 minutes prior to each hour of operation of the real-time market:

1. **Price Screen:** AMP predicts prices for each 15-minute interval of the operating hour based upon submitted bids and predicted imbalance.[2] If any predicted interval price in any ISO congestion zone exceeds $91.87/MWh, AMP applies the Conduct Test.
2. **Conduct Test:** AMP compares each resource's bid to its *Reference Level,* a benchmark generally based upon the resource's rolling average of bids from the previous 90 days. In the event that a bid exceeds its reference level by the lower of $100 or twice the reference level, the resource is said to have failed the Conduct Test.
3. **Impact Test:** AMP substitutes reference levels for all resources that have failed the Conduct Test. AMP then re-calculates the predicted prices based upon this reconstructed supply curve. If the average predicted price over the four 15-minute intervals is $50 above or twice the original predicted price, whichever is lower, the Impact Test is said to have been failed.

In the event that the Impact Test is failed, all resources whose bids failed the Conduct Test are mitigated. That is, their reference levels replace submitted bids for purposes of actual real-time dispatch and pricing.

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[1] *California Independent System Operator Corporation,* 100 FERC ¶ 61,060 (2002) (July 17 Order).

[2] AMP actually runs for four 15-minute predicted intervals in each hour, rather than for the 12 actual 5-minute market intervals each hour. This was a design tradeoff that could provide similar predictive value in a computer processing timeframe that was feasible for hourly operation.

Accounting of AMP Activity for 2007 Q4 Through 2008 Q2

The following figures and discussion cover the nine months, October 2007 through June 2008, with specific attention paid to instances where running AMP resulted in actual bid mitigation. Table 1 below shows some summary statistics for each of these nine months. Note that mitigation occurred in a total of 10 hours during this nine month period.

Table 1: Summary of Conduct and Impact Test Failures for October 2007 – June 2008

Month	Hours in the Month	Hours w/ >= 3 Intervals Priced >= $91.87	Hours with Conduct Test Failures	Impact Test Failures (Mitigation)	Avg. Hourly MCP with Mitigation
Oct-07	744	24	27	2	$36.87
Nov-07	721	37	64	2	$11.43
Dec-07	744	32	66	2	$39.87
Jan-08	744	89	82	0	
Feb-08	696	74	89	1	$52.76
Mar-08	743	139	109	0	
Apr-08	720	258	222	2	$73.52
May-08	744	222	126	1	$51.46
Jun-08	720	472	239	0	

The third column in Table 1 shows the number of hours in the month where at least three five-minute intervals were priced at or above $91.87/MWh. This statistic is presented to indicate the number of hours where there was a significant number of intervals priced greater than the Price Screen threshold of $91.87. Note that these prices are actual market outcomes and will be influenced by any mitigation that has occurred, however since mitigation took place in only ten hours during this nine month period, we are able to glean from these figures in how many hours prices were significantly high that AMP may have been triggered by failure of the price screen.[3] Generally, the percent of hours where there were three or more intervals priced over $91.87 ranged from (nearly) 3% to 66% across the nine months.

The fourth column in Table 1 shows the number of hours where the Price Screen failed, triggered evaluation of the Conduct Test, and the Conduct Test was failed by one or more generators. In general, in all hours there are high priced energy bids submitted that are high enough that they would likely fail the Conduct Test. Given this, the frequency of hours with Conduct Test failures is also an indication of the frequency of hours where the Price Screen failed as well.

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[3] Since implementation of RTMA on October 1, 2004, the 15-minute interval prices generated by the price predictor and used in evaluating whether or not the Price Screen was failed are not readily available and can only be viewed by retrieving and reading from RTMA "Saved Cases". This is an extremely cumbersome process and was not undertaken for this summary.

The last two columns in Table 1 show the number of hours in which bids were mitigated as a result of AMP and the average hourly price during those mitigated hours. Bid mitigation occurred in a total of ten hours during these nine months.

Test Failures

AMP Conduct failures are correlated with high electricity prices, because the test is only applied whenever a predicted interval MCP exceeds $91.87/MWh. The failures also appear to be correlated with rapid changes in natural gas prices. Generators tend to increase their bids immediately when facing suddenly higher natural gas costs. However, reference levels are adjusted for gas price changes on a monthly basis, using a monthly gas index. Frequent Conduct Test failures maybe due in part to the lag between the changes in daily spot natural gas prices (as reflected in supplier's bids from day to day) and monthly adjustments to the reference levels to reflect the changes in natural gas prices. As seen in Table 2, the price of natural gas in Southern California increased from roughly $6.6 / MMBtu to $11.5 / MMBtu over this nine month period. In addition to increasing natural gas prices, the two heat waves in May and June 2008 increased loads significantly and required the ISO to dispatch further up the supply curve into the pool of higher-cost units during these periods. The dispatch of higher-cost units, along with the increasing natural gas prices, resulted in more frequent Conduct Test failures.

Table 2: Conduct Test Failures vs. Natural Gas Normalization Index and Prices:
October 2007 – June 2008

Month	Conduct Test Failures	Impact Test Failures	Avg. Hourly Market Clearing Price	Gas Price Index (So. Calif.)
Oct-07	27	2	$56	$6.6
Nov-07	64	2	$56	$5.8
Dec-07	66	2	$59	$6.9
Jan-08	82	0	$69	$7.6
Feb-08	89	1	$68	$8.1
Mar-08	109	0	$73	$8.8
Apr-08	222	2	$87	$9.7
May-08	126	1	$74	$9.8
Jun-08	239	0	$99	$11.5

Table 3 shows summary statistics for the hours where mitigation did occur. Generally, the number of resources that failed the Conduct Test and had their bids mitigated when the Impact Test failed ranged from 11 to 31 resources. During these nine months, three out of ten hours where bids were mitigated occurred in the afternoon when loads are peaking and imbalance supply can be tight.

Table 3: AMP Mitigation Detail for October 2007 – June 2008

Date	Hour	Number of Mitigated Units	Hourly Load (MWh)	Hourly Average MCP ($/MWh)
11-Oct-07	23	31	26,216	$38.06
24-Oct-07	16	11		$35.67
11-Nov-07	4	18	19,631	$14.45
13-Nov-07	4	19	20,726	$8.40
09-Dec-07	19	20	30,719	$30.28
10-Dec-07	23	19	28,030	$49.45
26-Feb-08	19	13	30,027	$52.76
07-Apr-08	8	14	25,932	$69.95
07-Apr-08	24	23	23,108	$77.08
15-May-08	21	11	36,745	$51.46

Six out of ten hours where bid mitigation occurred where in the very early morning or late evening when the different rates at which load and schedules ramp can force the imbalance market to move significantly further up the bid curve quickly to dispatch sufficient ramping energy to cover any disconnect between load and schedule ramps.

The Impact Test failure occurred in two hours on April 7, 2008, triggering mitigation. On that day, the scheduled load was significantly below actual load, requiring the ISO to dispatch further up the imbalance supply curve which resulted in dispatch of higher-cost resources and consequently higher (forecast and actual) prices.