

**CONTAINS PROTECTED MATERIAL -  
NOT AVAILABLE TO COMPETITIVE DUTY PERSONNEL**

**Index of Relevant Material Template**

<b>Submitter (Party Name)</b>	California Parties
<b>Index Exh. No.</b>	CA-358
<b>Privileged Info (Yes/No)</b>	Yes
<b>Document Title</b>	Prepared Rebuttal Testimony of Michael J. Harris, Ph.D., Econ One, on Behalf of the California Parties
<b>Document Author</b>	Michael J. Harris, Ph.D.
<b>Doc. Date (mm/dd/yyyy)</b>	03/20/2003
<b>Specific finding made or proposed</b>	Market fundamentals do not explain the excessive prices charged by sellers in the ISO and PX markets during the period May 1, 2000 - June 20, 2001. The border prices indices currently used in the refund calculations pursuant to the <i>July 25<sup>th</sup> Refund Order</i> are not appropriate for use in this proceeding.
<b>Time period at issue</b>	a) before 10/2000; b) between 10/2000 and 6/2001
<b>Docket No(s). and case(s) finding pertains to *</b>	EL00-95 and EL00-98 (including all subdockets)
<b>Indicate if Material is New or from the Existing Record (include references to record material)</b>	New
<b>Explanation of what the evidence purports to show</b>	The concerns that Staff expressed in their August 2002 report relating to the validity of the California natural gas indices are valid. In their March 3, 2003 testimony, Drs. Hogan and Harvey claim that the Staff's report did not show that daily California border index prices for natural gas during the refund period were inaccurate. Among other things, Drs. Hogan and Harvey accept, without critical evaluation, a study done by Dr. David Reishus and Mr. Patrick Wang of Lexecon, filed with the Commission on October 15, 2002 in response to the Commission's request for comments on the method for determining natural gas prices for purposes of calculating refunds, that purports to show that the published price indices utilized in the California Refund Proceeding closely track the prices paid in the spot market for gas delivered to California, and are reasonable and reliable, whereas the alternative price index recommended in the Staff report is not. The Reishus/Wang study, however, suffers severely from the omission of actual results and

	documentation to back up its many claims, and makes numerous methodological errors, including errors in the creation of the database used and errors in statistics and comparisons. Ultimately, the Reishus/Wang study does nothing more than establish that some natural gas trades took place at the California border index prices, but the study does not address the crucial question of the manipulation of the index prices. Drs. Hogan and Harvey do not identify any of these numerous errors in their uncritical acceptance of the Reishus/Wang study. By performing a supply and demand analysis that included manipulated gas prices, Drs. Hogan and Harvey reach erroneous conclusions.
<b>Party/Parties performing any alleged manipulation</b>	Various sellers

\*This entry is not limited to the California and Northwest Docket Numbers.

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

<b>San Diego Gas &amp; Electric Company,</b>	)	<b>Docket Nos.</b>	<b>EL00-95-000</b>
<b>Complainant,</b>	)		<b>EL00-95-045</b>
	)		<b>EL00-95-075</b>
<b>v.</b>	)		
	)		
<b>Sellers of Energy and Ancillary Service</b>	)		
<b>into Markets Operated by the California</b>	)		
<b>Independent System Operator</b>	)		
<b>Corporation and the California Power</b>	)		
<b>Exchange,</b>	)		
<b>Respondents.</b>	)		
	)		
<b>Investigation of Practices of the</b>	)		<b>EL00-98-000</b>
<b>California Independent System Operator</b>	)		<b>EL00-98-042</b>
<b>and the California Power Exchange</b>	)		<b>EL00-98-063</b>

**PREPARED REBUTTAL TESTIMONY OF  
MICHAEL J. HARRIS, Ph.D., ECON ONE,  
ON BEHALF OF THE CALIFORNIA PARTIES**

- 1 Q. Please state your name and background.
- 2 A. My name is Dr. Michael Harris. I am the same Michael Harris that submitted
- 3 testimony on behalf of the California Parties on March 3, 2003 in the 100-day
- 4 discovery proceeding.
- 5 Q. What is the purpose of your rebuttal testimony?
- 6 A. I have been asked by the California Parties to comment on the statements made by
- 7 Drs. Hogan and Harvey regarding a “study” of natural gas sales and purchases for
- 8 California delivery points during the October 2000 through June 2001 period done

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1 by Dr. David Reishus and Mr. Patrick Wang on behalf of Duke Energy, Dynegy,  
2 Mirant, Reliant Energy, and Williams.

3 Q. What statements did Drs. Hogan and Harvey make in relationship to this study?

4 A. Drs. Hogan and Harvey claim that the FERC staff report<sup>1</sup> did not show that daily  
5 California border index prices for natural gas during the Refund Period were  
6 inaccurate. They claim that,

7 ....the mere existence of an active spot market tends to validate  
8 the reported natural gas prices. After all, if the reported natural  
9 gas prices were inconsistent with actual transaction prices,  
10 market participants would have noted this at the time. It would  
11 be surprising if natural gas was bought and sold at prices that  
12 were materially different than those reported in the trade press,  
13 yet none of the many entities buying and selling natural gas at  
14 the time noticed the discrepancy.<sup>2</sup>

15  
16 Q. Is it true that none of the entities buying and selling natural gas at the time noticed a  
17 discrepancy?

18 A. No. As I pointed out in my March 3, 2003 testimony (Exh. No. CA-15), Enron  
19 found that customers such as Sempra would not buy gas at the daily border index  
20 price because they could not, in turn, find customers to resell the gas. Moreover, if  
21 multiple parties were engaged in manipulation, or were relying on the high reported  
22 prices as proof that their own sales were reasonable, each would have had an  
23 incentive not to identify anomalies in the reported prices.

24 Q. What do Drs. Hogan and Harvey recommend must be done to verify whether the  
25 indices are correct?

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<sup>1</sup> Staff of the Federal Energy Regulatory Commission, "Initial Report on Company-Specific Separate Proceedings and Generic Reevaluations; Published Natural Gas Price Data; and Enron Trading Strategies," Docket PA-02-02-000, August 2002.

<sup>2</sup> Exhibit No. MIR-1, p.53.

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1 A. Drs. Hogan and Harvey claim that a validation of reported transaction prices against  
2 actual transaction prices is needed. They go on to state that this validation has  
3 already been done by Dr. David Reishus and Mr. Patrick Wang of Lexecon.<sup>3</sup> The  
4 Reishus/Wang study claims to show that the indices are very highly correlated with  
5 arm's length transaction prices and that average transaction prices are very similar  
6 to the index prices. It purports to rely on over 18,000 arm's-length transactions and  
7 very substantial gas volumes. Drs. Hogan and Harvey have reviewed the  
8 methodology used by Dr. Reishus and Mr. Wang and claim that it appears  
9 reasonable. It does not appear, however, that they reviewed the data, and corrected  
10 for potential errors discussed below. Thus, endorsement of a general methodology  
11 of looking at actual purchases does not constitute validation of the results derived  
12 from a non-random sample of unverified underlying data.

13 Q. Have you reviewed the methodology used by Dr. Reishus and Mr. Wang?

14 A. Yes. I have reviewed the Reishus/Wang methodology, including the limitations  
15 disclosed about the study and its underlying data. Contrary to assertions by Drs.  
16 Hogan and Harvey, the methodology is not reasonable and the study cannot be  
17 relied upon to make generalized conclusions about natural gas transactions. The  
18 Reishus/Wang study suffers severely from the omission of actual results and  
19 documentation to back up its many claims. In addition, the study makes numerous  
20 methodological errors.

21 Q. Please state precisely the conclusions of the study.

22 A. Dr. Reishus and Mr. Wang purport to find,

23 ...that the published price indices utilized in the California  
24 Refund Proceeding closely track the prices paid in the spot  
25 market for gas delivered to California and are an economically

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<sup>3</sup> FERC Docket No. EL00-95-045 (October 15, 2002).

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1 reasonable, statistically reliable, and robust measure of the  
2 value in that market. The alternative price index that the Staff  
3 Report recommends be substituted as the measure of spot  
4 market values in the California markets for calculating  
5 mitigated market-clearing prices in the Refund Proceeding  
6 does not track prices paid in actual purchase and sale  
7 transactions and is, therefore, not representative of values  
8 realized in those markets.<sup>4</sup>

9 As I stated, however, these conclusions simply cannot be derived from the analysis  
10 presented.

11 Q. What methodological errors are made by Dr. Reishus and Mr. Wang?

12 A. The methodological errors fall into two categories. First, there are errors in the  
13 creation of their database. Second, there are errors in their statistics and  
14 comparisons.

15 Q. Please describe the errors in the creation of their database.

16 A. There are six primary errors in the construction of their database.

17 **ERROR 1: There was no independent verification of the data selection**  
18 **process.**

19 Dr. Reishus and Mr. Wang obtained data from six companies: Duke, Dynegy,  
20 Mirant, Reliant, Williams, and Coral (Gas Traders). The Gas Traders  
21 independently reviewed their private transactions data and admittedly supplied only  
22 a subset of that data to Dr. Reishus and Mr. Wang that was claimed to satisfy 5  
23 criteria. Dr. Reishus and Mr. Wang admit that in some cases they could not verify  
24 if the data that they received from the Gas Traders met the criteria that they  
25 specified.

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<sup>4</sup> *Affidavit of David Reishus and Patrick Wang*, Revised Version, 11-12-02, p.3.

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1           **ERROR 2: No analysis was done of wash trades and round-trip trades**  
2           **and the potential effect on spot prices.**

3           One of the criteria used to develop the subset of data was that wash trades and  
4           round-trip trades were specifically excluded. But it is not clear how that was done.  
5           For example, Reliant continues to contend that it never engaged in wash gas trades  
6           in the west or California. But as I pointed out in my March 3, 2003 testimony,  
7           Enron's dataset of its wash transactions include numerous Reliant wash trades –  
8           with a particularly brisk pace of such trading during the December 2000  
9           extraordinary price run ups in the daily border index. If Reliant submitted data  
10          concerning one side of those wash transactions to Reishus/Wang, it is not clear how  
11          Reishus/Wang could have determined that those transactions should be excluded.  
12          The study was entirely dependent on the subset of transactions chosen by the Gas  
13          Traders.

14           **ERROR 3: The data used by Dr. Reishus and Mr. Wang was not**  
15           **comparable between the Gas Traders.**

16          Another one of the criteria that was used to develop the subset of data was that only  
17          transactions for which molecules “flowed” within one business day of contract  
18          agreement and for which there was a single flow date were included. However,  
19          there were specific problems with the data from certain Gas Traders.  
20          Reishus/Wang concede that one company could not distinguish between a multi-day  
21          contract that was less than a month and consecutive daily contracts, thus all multi-  
22          day trades of less than a month were included. In the case of another Gas Trader,  
23          certain multi-day transactions priced using index were included. As discussed  
24          below, a comparison of indexed transactions to the indexes will yield a high  
25          correlation, but proves nothing. Because none of the underlying data for the  
26          Reishus/Wang study has been released, it is impossible to tell how much of the

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1 Reishus/Wang study is premised on data from one company or another, using one  
2 criteria or another.

3 **ERROR 4: The filtering of outliers may have been done incorrectly,**  
4 **but, at a minimum would need to be more thoroughly explained.**

5 Dr. Reishus and Mr. Wang filtered 855 transactions out of the database. These  
6 transactions were defined as outliers -- observations that were more than two  
7 standard deviations above or below the volume-weighted average spot price.  
8 However, no information is given to us about the prices of those transactions. Were  
9 they all low priced transactions? In effect, after sellers themselves excluded data  
10 using arbitrary and unknown criteria, Reishus and Wang then excluded even more  
11 data. It is therefore impossible to determine whether the remaining data is actually  
12 representative of legitimate arms length negotiated transactions.

13 **ERROR 5: An estimated 10% of the transactions are duplicates and**  
14 **these duplicates are included in the reported results.**

15 Dr. Reishus and Mr. Wang include both purchases and sales in their database of  
16 18,320 transactions. However, they openly acknowledge that this will result in a  
17 double counting of many transactions. They state that, “[u]tilizing a matching  
18 algorithm, we believe that the number of transactions represented as both purchase  
19 and sale is 10% or less of the sample.”<sup>5</sup> Dr. Reishus and Mr. Wang do not  
20 investigate this issue further to determine the precise magnitude of double counting  
21 and inexplicably, they do not even attempt to remove the estimated 10% of  
22 duplicates from the data.

23 Q. Do Dr. Reishus and Mr. Wang make any other errors in the creation of their  
24 database?

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<sup>5</sup> Footnote 15, p.15.



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1 A. Yes.

2 **ERROR 6: The data sample is potentially biased.**

3 Dr. Reishus and Mr. Wang attempt, in their study, to make conclusions about the  
4 entire population of spot market transactions. Based on their study, we are to  
5 conclude that the published price indices are representative of *all* prices paid in the  
6 spot market for gas delivered to California. It is not clear that the Gas Traders that  
7 were selected comprise a representative sample of traders overall. Dr. Reishus and  
8 Mr. Wang do not explain how the Gas Traders were selected. Nor do we even have  
9 any idea how much of the final sample was made up of each of the six traders  
10 analyzed. Given that each trader provided a subset of its data, and that Reishus and  
11 Wang then further excluded data, it may be that the final analysis is composed  
12 mainly of transactions involving only one or a few of the Traders, and we don't  
13 know for any of the traders what portion of their total transactions were considered  
14 in the analysis. So we don't even know if the analysis is representative of any of  
15 these Gas Traders much less the entire market.

16 Q. What errors do Dr. Reishus and Mr. Wang make in their statistics and comparisons?

17 A. **ERROR 7: Comparisons were made between gross purchases**  
18 **contained in the database and actual delivered quantities. This**  
19 **artificially inflated the percentages calculated. Additionally, volumes**  
20 **in the transactions database were compared to delivered gas volumes**  
21 **from a different period. It is not clear how to interpret such a**  
22 **comparison.**

23 Dr. Reishus and Mr. Wang list the number of transactions and the amount of gas  
24 included in those transactions for three delivery points: Malin, PG&E Citygate, and  
25 Southern California. For Southern California, they compare the volume of  
26 purchased gas in their database to the daily average gas sourced to Southern

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1 California Gas Company in 2000. Then they compare the average daily volume of  
2 gas in the database for Southern California to the daily volume delivered by  
3 Southern California Gas Company for electric generation in 2000. There are two  
4 problems with these comparisons. First, they compared “purchased gas” to  
5 “sourced gas”. The purchased gas in the database is a gross number—it is not net  
6 of sales, therefore, it would not be comparable to a “sourced” number, which would  
7 reflect actual deliveries or net purchases. Second, the time periods of the two data  
8 sets are different. The transactions database is constructed over the period of  
9 October 2000 to June 2001. The gas volumes offered for comparison are taken  
10 from the year 2000. The same errors are made in the comparison at the other two  
11 delivery points.

12 Q. Do Dr. Reishus and Mr. Wang make other statistical errors?

13 A. Yes.

14 **ERROR 8: Indexed transactions (transactions whose price is based on**  
15 **the index) are compared to the index prices.**

16 An overriding concern with this study is the inclusion of indexed transactions in the  
17 transactions database. Dr. Reishus and Mr. Wang calculate correlations between a  
18 set of transactions that include transactions that are priced at the index and the index  
19 prices. It is hardly surprising that they find that the two are highly correlated and  
20 overlapping. Dr. Reishus and Mr. Wang do not reveal what portion of their  
21 database consists of indexed transactions. They do not report the effect on their  
22 results of removing these transactions.

23 Q. You stated above that the Reishus/Wang study suffers severely from the omission  
24 of actual results and documentation to back up its many claims. Can you explain  
25 these omissions in more detail?

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1 A. We do not know what portion of the data was obtained from each of the Gas  
2 Traders, what proportion of the data was purchases as opposed to sales, net  
3 purchases or sales numbers, or what portion of the trades were made at index prices.  
4 Dr. Reishus and Mr. Wang claim that the transactions in the database appear  
5 continuously throughout the period, but they do not provide monthly totals or  
6 averages. For example, we do not know how many transactions occurred in the  
7 month of December 2000, or how the volumes traded during the period covered in  
8 the study compared to volumes traded during the same period a year prior. All this  
9 information is needed in order to evaluate the significance of the analysis. Hogan  
10 and Harvey, however, do not even identify any of these issues, and therefore their  
11 review and endorsement, on behalf of some of the same clients who commissioned  
12 the study they support, must be regarded as an uncritical acceptance of another  
13 person's results, rather than an expert's own validation.

14 Dr. Reishus and Mr. Wang state that they performed a number of robustness tests.  
15 They claim to have repeated their analyses including the outliers. They claim to  
16 have repeated them again removing each company, one at a time, from the database.  
17 They claim to have looked at purchases only or only those transactions that were  
18 not explicitly priced using the index. Dr. Reishus and Mr. Wang claim that these  
19 tests result in the same fundamental patterns and that their conclusions do not  
20 change. *We can only speculate about what these tests revealed. Dr. Reishus and*  
21 *Mr. Wang have not included any documentation or results that relate to these*  
22 *robustness tests.*

23 Q. What can be concluded from the Reishus/Wang study?

24 A. Dr. Reishus and Mr. Wang have done nothing more than establish that at least some  
25 trades took place at the California border index prices. More importantly, they have  
26 not addressed the crucial question of the manipulation of the index prices. As my

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1 testimony<sup>6</sup> filed March 3, 2003 establishes, there are many grounds to suspect the  
2 validity of, and the manipulation of, these indices.

3 Q. What did the Staff Report say about the manipulation of the gas price indices?

4 A. The Staff Report explains that both participants in the California gas and electric  
5 markets had the incentive to manipulate gas price indexes. This incentive to  
6 manipulate prices extended to both buyers and sellers of gas. In particular, buyers  
7 of gas that were also sellers of electricity in the California markets had the incentive  
8 to manipulate gas price indexes. These concerns have been validated by reported  
9 instances of manipulation released after the Staff report and described in my  
10 exhibit. Higher gas price indexes could benefit sellers of electricity when increased  
11 gas costs result in higher electricity prices. In this case, gas-fired generators are  
12 able to increased gas costs through increased electricity prices, and all generators  
13 could benefit from the higher electricity prices. Additionally, electricity sellers  
14 could use higher gas price indices to justify higher electricity prices. As stated in  
15 the Staff Report,

16 Certainly, there is a significant incentive on the part of certain  
17 market participants to deliberately misreport prices, given that  
18 natural gas is the fuel input for the electricity generators that set  
19 the market price in California and the rest of the West.  
20 Unscrupulous traders could manipulate natural gas price indexes  
21 in order to increase the profitability of their electricity positions.<sup>7</sup>

22 The Staff Report also finds evidence of manipulation of gas price indices.

23 Q. What significance does the manipulation of gas price indices have for the studies  
24 done by Drs. Hogan and Harvey and others who examine supply and demand  
25 conditions in California over the January 2000 to June 2001 period?

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<sup>6</sup> Exhibit No. CA-15.

<sup>7</sup> Staff Report, p.47.

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1 A. Given the evidence that has been uncovered of wash trading and false reporting, it  
2 would be inappropriate to use manipulated gas prices in a study of the competitive  
3 determinants of electricity prices. A supply and demand analysis that included  
4 manipulated gas prices would result in erroneous conclusions. It would not be  
5 appropriate to use manipulated gas prices in supply/demand studies, nor would it be  
6 appropriate to use manipulated gas prices in the calculation of refunds.

7 Q. Do you have any other evidence that the California border index prices did not  
8 reflect the prices at which buyers and sellers transacted?

9 A. Yes. In earlier studies Dr. Carolyn Berry compared the MMCP and the actual bids  
10 of the units that determined the MMCPs.<sup>8</sup> She concluded that the owners of the gas-  
11 fired units that bid into the California ISO imbalance energy market did not view  
12 the daily gas price indexes that FERC has mandated for use in the Refund  
13 Proceeding to be either their actual cost of gas or their opportunity cost of gas.<sup>9</sup>  
14 This is consistent with the PX market monitors' conclusion in their March 1999  
15 report that most new generation owners likely relied upon a mixture of spot and  
16 forward market gas, and therefore were not exposed to daily spot variation as a cost  
17 basis.<sup>10</sup> This is consistent with my conclusions.

18

19 Q. Does this conclude your testimony?

20 A. Yes.

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<sup>8</sup> California Parties Comments on Method for Determining Natural Gas Prices for Purposes of Calculating Refunds, Declaration of Dr. Carolyn A. Berry, October 15, 2002.

<sup>9</sup> *Id.* at 7.

<sup>10</sup> See PX March 1999 report, p. 65, FN35 (Exhibit No. CA-291 at 97).


UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

San Diego Gas & Electric Company,	)	
Complainant	)	
	)	
v.	)	Docket Nos. EL00-95-069
	)	EL00-95-045
Sellers of Energy and Ancillary Services Into	)	EL00-95-075
Markets Operated by the California	)	
Independent System Operator Corporation	)	
and the California Power Exchange,	)	
Respondents.	)	
	)	
Investigation of Practices of the California	)	Docket Nos. EL00-98-058
Independent System Operator and the	)	EL00-98-042
California Power Exchange.	)	EL00-98-063

**AFFIDAVIT OF MICHAEL HARRIS**

I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 18, 2003.

  
\_\_\_\_\_  
Michael Harris