

Index of Relevant Material

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Index Exh. No.	CA-354
Privileged Info (Yes/No)	Yes
Document Title	Prepared Rebuttal Testimony of Philip Hanser on Behalf of the California Parties
Document Author	Philip Hanser
Doc. Date (mm/dd/yyyy)	03/20/2003
Specific finding made or proposed	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. Sellers engaged in arbitrary markups over costs during periods of declared ISO emergencies. Sellers withdrew units during emergency periods without a mechanical or cost basis.
Time period at issue	b) between 10/2000 and 6/2001
Docket No(s). and case(s) finding pertains to *	EL00-95 and EL00-98 (including all subdockets)
Indicate if Material is New or from the Existing Record (include references to record material)	New
Explanation of what the evidence purports to show	Hockey stick bidding is neither a legitimate bidding strategy, nor is it necessary to recover investment costs. Bidding at price cap during shortages is not scarcity pricing. The econometric analysis of outages in the testimony of Harvey and Hogan suffers from various significant problems that make their conclusions questionable.
Party/Parties performing any alleged manipulation	Reliant

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

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

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

**PREPARED REBUTTAL TESTIMONY OF
PHILIP HANSER
ON BEHALF OF THE CALIFORNIA PARTIES**

1 **I. INTRODUCTION**

2 Q. Please state your name and background.

3 A. My name is Philip Hanser. I am the same Philip Hanser that previously
4 testified in these proceedings¹. My qualifications are contained in my prior
5 testimony.

6 Q. What is the purpose of your rebuttal testimony?

7 A. I respond to the arguments provided in the testimony of Mr. Cliff Hamal² and
8 Drs. Scott Harvey and William Hogan³ related to hockey stick bidding, and to
9 the econometric analysis of outage rates provided in the testimony of Drs.
10 Harvey and Hogan. Section II presents my rebuttal related to hockey stick
11 bidding, and Section III includes my response to the econometric analysis of
12 outage rates in the testimony of Drs. Harvey and Hogan.

13 **II. HOCKEY STICK BIDDING**

14 Q. Does it appear to be the case that Suppliers engaged in hockey stick bidding?

15 A. Yes, they used this approach extensively. As my prior testimony
16 demonstrated, suppliers increased their bid margins the larger their market
17 position and in response to tighter market conditions. The degree to which this

¹ Exh. Nos. CA-9 and CA-10.

² Prepared Direct Testimony of Cliff H. Hamal (Exh. No. REL-1).

³ Prepared Direct Testimony of Scott M. Harvey and William H. Hogan (Exh. No. MIR-1).

1 occurred varied across suppliers, nonetheless this approach to setting bid
2 margins was used by all suppliers for nearly all time periods.

3 Q. Could you provide an example of this sort of bidding by Suppliers?

4 A. Yes, Reliant, like all of the other Suppliers, engaged in such a bidding
5 approach as can be seen in Exh. No. CA-371, where their traders structured
6 bids with increasing markups over their generation costs, the basic hockey
7 stick structure. From this document it is clear that Reliant employed this
8 strategy extensively during declared ISO emergencies in December 2000. One
9 of the more colorful examples, also provided by Reliant, appears in a transcript
10 of a conversation on June 13th between Kevin Frankeny, one of Reliant's chief
11 traders, and another Reliant employee, which finds Frankeny instructing the
12 development of energy bids associated with ancillary services running from a
13 generation cost of \$42/MWh up to \$750/MWh:

14 *"Kevin: And when you do the energy curves we want to push the price up to*
15 *750 because they are probably going to need it. So I mean you start, you*
16 *know, down around 42.*

17 *Bill: Work all the way up?*

18 *Kevin: Work it up, all the way up.*

19 *Bill: Okay.*

20 *Kevin: Yep. All the way to the top." Exh. No. CA-370.*

1 The direct testimony of Dr. Carolyn Berry discusses many other instances of
2 this sort of bidding practice by many suppliers. (*See* Exh. No. CA-7.)

3 Q. Did Mr. Hamal argue that hockey stick bidding is a legitimate bidding
4 strategy?

5 A. Yes. As mentioned on page 3 and pages 32-33 in his testimony, Mr. Hamal
6 suggested that hockey stick bidding does not constitute market manipulation,
7 and is in fact necessary partly because this bidding strategy enables a
8 generation owner to recover investment costs. Moreover, he argued that
9 hockey stick bidding could also provide pricing signals for new generation.

10 Q. Do you agree with Mr. Hamal on the necessity of hockey stick bidding to
11 recover investment costs and to provide pricing signals for new generation
12 investment?

13 A. No. First, hockey stick bidding in energy markets is not necessary to recover
14 investment costs. The combination of revenues from the energy and ancillary
15 services markets should provide sufficient revenues to recover costs and earn
16 competitive returns in the long run, even if the suppliers do not employ hockey
17 stick bids. In particular, the CAISO real-time energy markets are based on a
18 uniform-price auction, in which all accepted bids receive a single market-

1 clearing price for their output⁴. This means that the sellers receive the same
2 price for all inframarginal capacity and inframarginal units. Hence, most of the
3 units are paid a price that exceeds their bids. Moreover, even the marginal unit
4 bidding its marginal cost of generation only in the energy market would get a
5 contribution to recover its investment costs as long as its marginal cost exceeds
6 its average cost of generation. Therefore, most suppliers who are
7 inframarginal can expect to recover their investment costs in the long run by
8 bidding their marginal costs for their units in the energy markets, without
9 resorting to hockey stick bidding or any other bidding strategy that deviates
10 from marginal cost.

11 Moreover, and importantly, the energy markets are not the only source of
12 revenue for suppliers. Ancillary service markets, such as operating reserves
13 markets, provide reservation payment compensation in addition to the revenues
14 from energy markets for generation output actually produced. A supplier
15 bidding into the operating reserves markets, whose bid is accepted, receives a
16 contribution toward investment costs even if the unit is never dispatched (i.e.,
17 does not receive any energy market payments) or the unit is only dispatched at
18 prices equal to its average generation cost. These payments from the ancillary
19 services markets combined with revenues from the energy markets should also

⁴ From December 8, 2000 until June 20, 2001 the CAISO instituted a so-called "soft" price cap. During this period bidders could bid above the \$250 price cap, but bids above the cap did not set the market price. Thus, the supplementary energy market behaved as a uniform price auction up to the price cap and as a discriminatory auction above the price cap. Obviously our analysis on inframarginality of bids during this period holds only for bids below the price cap.

1 provide signals for new entry when the generation is scarce. This is
2 particularly the case when scarcity makes reserve capacity very valuable.

3 Third, FERC found in its April 26, 2001 Order⁵ that hockey stick bids, in fact,
4 are anti-competitive and prohibited.

5 Fourth, and finally, the various other witnesses who have submitted testimony
6 as part of the California Parties March 3, 2003 filing, including Dr. Peter Fox-
7 Penner (Exh. No. CA-1), Dr. Gary Stern (Exh. No. CA-3), Dr. Robert J.
8 Reynolds (Exh. No. CA-5), and the aforementioned Berry, have documented
9 strategies used by the various sellers in the market to withdraw supply from the
10 PX or ISO auction markets. My March 3 testimony, which described outage
11 situations reported to the ISO that are inconsistent with the facts likewise show
12 a strategy of withdrawing supply from the PX or ISO auctions. The hockey
13 stick bids submitted by sellers were a way to capitalize on that withdrawal of
14 supply, to ensure that the withdrawal of supply would lead to higher prices.
15 Thus, the hockey stick bids should not be viewed in isolation, but should
16 instead be considered in light of the various strategies that have been
17 documented. Viewed in that light, there is no question that hockey stick bids
18 were an anti-competitive effort to exercise market power.

19 Q. Did Mr. Hamal also argue that bidding above marginal cost is desirable for
20 scarcity pricing?

⁵ *San Diego Gas & Electric Co. et al.*, 95 FERC ¶61,115 at 61,360 (2001).

1 A. Yes. He suggests that bidding some of the capacity above marginal cost results
2 in rising prices when the system gets closer to scarcity conditions. Conversely,
3 he argues that bidding all capacity at marginal costs results in higher prices
4 only during scarcity conditions, when the demand is involuntarily curtailed.

5 Q. Do you agree with Mr. Hamal that bidding generation at marginal cost would
6 increase market prices only during shortage conditions, so that the price signals
7 for new entry starts forming too late?

8 A. No. As the system moves towards exhausting supply, a competitive market --
9 with suppliers bidding all capacity at marginal cost -- produces two important
10 price signals for new generation. The first price signal is an increase in energy
11 prices due to the fact that less efficient generating resources are coming on-line
12 to meet demand. The second price signal begins when the CAISO awards
13 ancillary service payments for resources providing reserve capacity. The price
14 for reserve capacity will increase sharply during scarcity conditions. And if
15 the units that the CAISO holds in reserve are called to produce energy, these
16 reserve resources are paid for both their energy and for reserving their
17 capacity. Therefore, even before the system reaches actual demand
18 curtailment, the energy and ancillary services markets provide strong price
19 signals indicating that the resources are getting closer to shortage conditions.

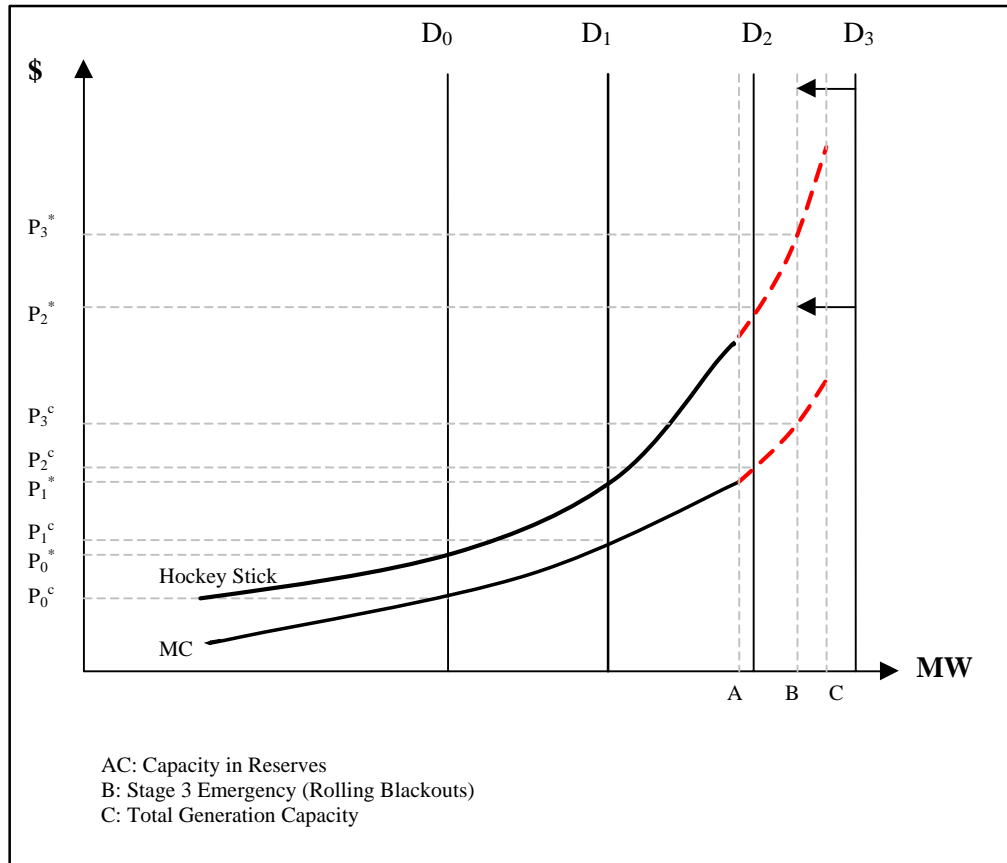
1 The price signals provided by markets as the system moves closer to shortage
2 conditions are illustrated in Figure 1.⁶ I compared the implications of two
3 forms of bidding behavior. The first one (labeled as “MC”) is the bid curve
4 that corresponds to bidding at marginal cost. The second one (labeled as
5 “Hockey Stick”), is the bid curve for hockey stick bidding above marginal
6 costs. The solid portion of each bid curve represents the bids in the energy
7 market, and the dashed portion at the end represents the capacity associated
8 with the energy bids in reserve markets. The inelastic market demand takes
9 several values, labeled as D_0 through D_3 .

10 The first observation from the figure is that the hockey stick bidding yields
11 higher market prices relative to bidding at marginal cost, especially when the
12 demand is high. Moreover, as demand rises from D_0 to D_1 , the competitive
13 market price increases (from p_0^c to p_1^c) due to less efficient units being called
14 to generate. But the same increase in demand would lead to a higher change in
15 prices when suppliers submit hockey stick bids. If the demand increases to D_2 ,
16 then energy bids associated with reserves will be "bids in the energy market".
17 The competitive price would rise to p_2^c , and a portion of demand is satisfied by
18 the generating units held by the CAISO as reserves. But if the demand gets
19 higher than the level after which a Stage 3 emergency is declared (rolling
20 blackouts), the CAISO curtails demand randomly among different consumers
21 to point B. Note that this curtailment would not be needed if the demand was

⁶ See Exh. No. CA-1 at 57-65.

responsive to price. Hockey stick bidding during those curtailment conditions would only increase the price, without any efficient rationing from the demand side. Note that this figure does not show payments for reserve capacity.

Figure 1



Q. Do you agree that it is necessary for suppliers to use hockey stick bidding in the California electricity market in order to have an efficient allocation of scarcity rents between suppliers and consumers?

1 A. No. First, the concept of efficient allocation of scarcity rents through bids in
2 competitive markets is based on the premise that market demand is responsive
3 to price, i.e. there are some customers who are willing to pay for the last unit of
4 energy more than some others when all of the supply resources are exhausted.
5 If electricity demand was responsive to price, then the resulting price during
6 market scarcity conditions would be capped by the marginal willingness to pay
7 of the consumer who assigns the most value to that last unit of energy⁷.
8 However, the demand for electricity in real-time is practically vertical, i.e.
9 consumers do not respond to real-time market prices because they never see
10 those prices. The electricity market cannot allocate supply or scarcity rents
11 efficiently when demand is not sensitive to price. Thus the rents that accrue to
12 the marginal generator, resulting from bids substantially above marginal costs,
13 are proceeds that flow from that supplier's market power and little of that is
14 what economists would label as scarcity rents. In extreme shortage conditions,
15 the system operator will curtail some demand randomly so that the balance
16 between supply and demand is restored. Although this rationing of limited
17 generation sources among consumers is inherently inefficient (because of
18 consumers' inability to respond to prices), this in no way implies that the
19 suppliers need to bid substantially higher than their marginal costs to mimic the
20 capture of scarcity rents that would arise in competitive markets with

⁷ California's demand responsiveness programs were legally prohibited from interrupting customer loads solely in response to excessively high prices through 2001. Interruptions could only occur when system reliability was threatened as denoted by the various Stage Emergencies. Even so, such programs had a relatively small subscription base (i.e., less than 2,000 MW), and many customers failed to respond to interruption calls because the penalties were set too low.

1 responsive demand. Although the generators' ability to capture rents may be
2 due to scarcity, the majority of the rents collected are due to their market
3 power.

4 Second, and more importantly, hockey stick bidding occurred during many
5 hours when no scarcity actually existed. It is simply disingenuous to justify
6 around-the-clock hockey-stick bidding based on a situation that occurred in a
7 very limited number of hours during the period. Hockey stick bidding
8 absolutely is not necessary to recover investment costs during these periods,
9 and cannot be justified in any way as an "allocation mechanism" during the
10 hours when true scarcity did not occur, which is the vast majority of the period.

11 As I discussed above, units are able to recover their investment costs during
12 hours when their own costs are inframarginal to the market price. In addition,
13 as I discussed above, ancillary services sales are another means of recovering
14 investment costs since a generator need not incur any cash costs while selling
15 these services.

16 Q. Did Drs. Harvey and Hogan also present similar arguments attempting to
17 justify hockey stick bidding in shortage conditions?

18 A. Yes. As explained in their testimony,⁸ they suggest that competitive suppliers
19 have an incentive to submit bids exceeding marginal costs in shortage
20 conditions. Drs. Harvey and Hogan also argue that the CAISO is required by

⁸ Exh. No. MIR-1 at 143.

1 “NERC and WSCC policy” to accept all bids not exceeding the price cap
2 during shortage conditions.⁹

3 Q. Do you agree with Drs. Harvey and Hogan on these issues?

4 A. I agree with them that suppliers in California have an incentive to bid above
5 marginal costs, especially during shortage conditions. However, I do not agree
6 that this is the behavior that one should expect from suppliers under
7 competitive conditions.

8 As I mentioned earlier, the effects of such hockey stick bidding behavior
9 would be mitigated by the demand side if consumers had the ability to respond
10 to prices. But in the absence of such price discipline from consumers,
11 suppliers’ bidding their last increments of capacity at the price cap corresponds
12 to exercising market power to extract excess rents.

13 Moreover, I disagree with their interpretation that minimum operating reserve
14 requirements set by NERC and WSCC motivated suppliers to bid their
15 generation at the price cap. From my earlier testimony it is clear that Duke
16 does not seem to have been compelled to raise its bids excessively in periods
17 when the market was tight as did other generators. (*See* Exh. No. CA-9.) The
18 minimum reserve requirements effectively increase the need for capacity so
19 that the required minimum reserves are kept for system contingencies.

⁹ Exh. No. MIR-1 at 145.

1 However, this does not validate the behavior of suppliers to bid much higher
2 than their marginal costs during the shortage conditions.

3 **III. STATISTICAL ANALYSIS OF OUTAGE RATES**

4 Q. Do you have any concerns about the statistical analysis performed by Drs.
5 Harvey and Hogan on Mirant's generating units' outage rates?

6 A. Yes, there are three issues that make their analyses suspect. First, their model
7 fails to account for economic incentives for Mirant to shut its units down.
8 Second, their analysis merges the data of two fairly different generation
9 technologies, potentially leading to misspecification of their models. Third,
10 their exclusion of reserve shutdowns also leads to a biasing of their results.

11 Q. How do Drs. Harvey and Hogan fail to account for the economic incentives
12 properly?

13 A. Drs. Harvey and Hogan indicate that their analysis suggests that as market-
14 clearing prices rose in California, outage rates appeared to fall and they treat
15 this as confirming their hypothesis that Mirant did not withhold its generating
16 units. There are two problems with this conclusion. First, if Mirant were to
17 pursue a withholding strategy, as conditions in the market tighten, the amount
18 that it needs withhold in order to affect price goes down. Thus, if fewer of
19 Mirant's units are out when market conditions are tight and prices are high,
20 then contrary to Drs. Harvey and Hogan, this situation is completely consistent

1 with a withholding strategy. A more rigorous, but not conclusive, test of
2 whether outage rates were consistent with competitive behavior would be to
3 test the price-outage relationship among different years when competitive
4 behavior was more likely, e.g. 2000 versus 1999 and 1998, and even before
5 divestiture. H&H have not done this necessary step, so no conclusions can be
6 drawn from their analysis. Second, in the case of the California market, a more
7 important determinant of the incentive to withhold capacity through outages
8 were the caps on sellers bids. What was evidenced in the pattern of outages by
9 Mirant, among other sellers, is that as the price caps fell, the outage rates went
10 up. Again, this is consistent with a withholding strategy to raise prices. As the
11 price caps were reduced, the capability to effect an economic withholding
12 strategy was also reduced and, thus, physical withholding became more
13 attractive as a means of raising prices. Drs. Harvey and Hogan include no
14 variables in their model to account for the incentives to physically withhold
15 that would result from the changes in the price cap regimes.

16 Q. Please explain how Drs. Harvey and Hogan merge the data of two fairly
17 different generation technologies and how this is a misspecification of their
18 models?

19 A. The statistical outage analysis that they performed merged the data from two
20 substantially different generation technologies, steam turbines and combustion
21 turbine. While both technologies have turbine in their names, how they are
22 operated and their thermal-mechanical characteristics are substantially

1 different. Combustion turbines have relatively low capacity factors and can be
2 at nearly full load within 10-30 minutes. Past utility generation operating
3 practice would label them as peaking units. Steam turbines have much longer
4 start-up times, measured in hours, not minutes, and have been used in the past
5 as intermediate load units. Other differences include the frequency and nature
6 of their overhauls. Combustion turbines have fairly strict limitations on the
7 number of “equivalent operating hours” between overhauls typically indicated
8 by the turbine manufacturer, while steam turbine overhauls tend to be a
9 function of their boiler’s condition. Most importantly, older CTs of the vintage
10 owned by Mirant and other merchant generators have substantially higher
11 outage rates than steam turbines. When merging these outage rates, the
12 average can be greatly influenced by many other factors, such as overall
13 availability, output, and other types of maintenance. In any event, the net
14 result of these differences is that it seems unlikely that their merging the data
15 together can be taken as reasonable. Although their analysis makes a relatively
16 weak attempt at dealing with this by including at most a pair of variables
17 representing each plant, such an approach is inadequate at best, certainly
18 leading to a misinterpretation of the statistical results and, at worst, casts doubt
19 on their entire analysis.

20 Q. What do you mean that failing to include the reserve shutdowns biases their
21 results?

1 A. Drs. Harvey and Hogan exclude reserve shutdowns from their analysis, arguing
2 that a reserve shutdown arises because of a lack of demand. There are two
3 problems with this approach. First, although Drs. Harvey and Hogan argue
4 that the Potrero jets (Potrero units 4, 5, and 6) were under the control of the
5 CAISO, this claim is not supported by the documents cited in their testimony.
6 The Potrero jets were Condition 1 RMR¹⁰ units for the years 2000 and 2001,
7 and their RMR status changed to Condition 2 on January 1, 2002.¹¹ But even
8 the RMR contracts do not transfer the control of the RMR units to the CAISO.
9 The CAISO can give dispatch orders to the RMR units only when the units are
10 needed for local reliability reasons or for managing intra-zonal congestion.¹²
11 Therefore, Reliant had control over whether to bid its Potrero jets into markets
12 during 2000 and 2001.¹³ However, as explained in my testimony, Potrero 6
13 was placed on reserve shutdown by Mirant during a Stage 2 emergency on
14 November 20, 2000.¹⁴ Thus, of their study period, only a relatively small
15 proportion constitutes the period of CAISO control and, further, it appears that
16 there may be motives other than lack of demand inducing reserve shutdowns.
17 Note that Drs. Harvey and Hogan fail to have any variables in their models that

¹⁰ According to the CAISO's Pro Forma Must Run Service Agreement, a Condition 1 RMR unit may participate in market transactions, and the unit's owner retain all revenues from participation in market transactions. A Condition 2 RMR unit cannot participate in market transactions unless the CAISO issues a dispatch notice for the unit. Moreover, a Condition 2 RMR unit cannot retain the revenues from market participation when it is called. (See CAISO, "Pro Forma RMR Agreement", p. 20 (<http://www.caiso.com/docs/2001/10/15/2001101510162513782.doc>))

¹¹ See CAISO, "2002 Annual RMR Informational Report" for the change of RMR status of Potrero jets from Condition 1 to Condition 2 on January 1, 2002. (<http://www.caiso.com/docs/2003/02/12/200302121433346567.xls>)

¹² CAISO, "Pro Forma RMR Agreement", p. 22. See also CAISO, "Commentary by the California Independent System Operator Corporation on the CPU.2 Staff Investigative Report on Wholesale Electric Generation, released September 17, 2002", p. 9, (<http://www.caiso.com/docs/2002/10/28/200210281512206799.pdf>).

¹³ On April 26, 2001, the FERC ordered the sellers to offer all of their available capacity in real time markets or through bilateral agreements (must-offer requirement). (See San Diego Gas & Electric et al., 95 FERC ¶61,115 (April 26, 2001)).

1 attempt to distinguish the period of CAISO control from the period in which
2 Mirant had sole control. Second, their exclusion of reserve shutdowns and
3 treating them as “time out”¹⁵ is problematic because Sellers who placed their
4 units on reserve shutdown would often perform repairs on the units during
5 reserve shutdowns, although they often would not declare to the ISO what their
6 activities were. As a result, the frequency and duration of outages is also
7 contingent not only on overhauls and forced outage outages, a variable
8 included in their analysis, but also reserve shutdowns, a variable not included
9 in their model. Thus, their model suffers from an omitted variable bias. The
10 degree to which their estimated coefficients differ from estimates where this
11 problem has been resolved depends on how correlated the omitted variable is
12 with the other variables in their estimated equation.

13 Q. Does this conclude your testimony?

14 A. Yes, it does.

¹⁴ Exh. No. CA-10 at 37.

¹⁵ Exh. No. MIR-1 at 238.

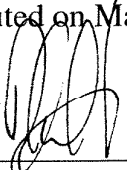
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

San Diego Gas & Electric Company,)	
Complainant)	
)	
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Independent System Operator and the)	
California Power Exchange.)	

AFFIDAVIT OF PHILIP HANSER

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

Executed on March 20, 2003.



Philip Hanser