

# **Attachment I**

## PENALTIES FOR UNISTRUCTED DEVIATIONS

**2.3.3.9.2** All notifications of Forced Outages shall be communicated to the ISO Control Center with as much notice as possible in order that the necessary security analysis and ISO Controlled Grid assessments may be performed. If prior notice of a Forced Outage cannot be given, the Operator shall notify the ISO of the Forced Outage immediately **within thirty (30) minutes** after it occurs.

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**2.5.22.11 Failure to Conform to Dispatch Instructions.** All Scheduling Coordinators, Participating Generators, owners or operators of Curtailable Demands and operators of System Resources providing Ancillary Services (whether self provided or procured by the ISO) or whose Supplemental Energy bids have been accepted by the ISO shall be obligated to respond or to secure response to the ISO's Dispatch instructions in accordance with their terms, and to be available and capable of doing so, for the full duration of the Settlement Period. **Dispatch Instructions will be deemed delivered and associated Energy will be settled as Instructed Imbalance Energy in accordance with Section 11.2.4.1.1.** If a Generating Unit, Curtailable Demand or System Resource is unavailable or incapable of responding to a Dispatch instruction, or fails to respond to a Dispatch instruction in accordance with its terms, the Generating Unit, Curtailable Demand or System Resource:

(a) shall be declared and labeled as non-conforming to the ISO's instructions, **unless it has notified the ISO of an event that prevents it from performing its obligations within 30 minutes of the onset of such event;**

(b) cannot set the ~~BEEP~~ Interval Ex Post Price; and

the Scheduling Coordinator for the Participating Generator, owner or operator of the Curtailable Demand or System Resource concerned shall ~~pay to the ISO~~ **have Uninstructed Imbalance Energy due to** the difference between the Generating Unit's, Curtailable Demand's or System Resource's instructed and actual output (or Demand). **The Uninstructed Imbalance Energy shall be subject to the settlement for Uninstructed Imbalance Energy in accordance with Section 11.2.4.1 and the Uninstructed Deviation Penalty in accordance with** ~~at the Beep Interval Ex Post Price in accordance~~

~~with~~ Section 11.2.4.1.2. This applies whether the Ancillary Services concerned are contracted or self provided.

The ISO will develop additional mechanisms to deter Generating Units, Curtailable Demand and System Resources from failing to perform according to Dispatch instructions, for example reduction in payments to Scheduling Coordinators, or suspension of the Scheduling Coordinator's Ancillary Services certificate for the Generating Unit, Curtailable Demand or System Resource concerned.

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**2.5.26.2.1** If the ISO determines that a Scheduling Coordinator has supplied Uninstructed Imbalance Energy to the ISO during a BEEP Interval from the capacity of a Generating Unit, System Unit or System Resource that is obligated to supply Spinning Reserve, Non-Spinning Reserve, or Replacement Reserve to the ISO during such BEEP Interval, payments to the Scheduling Coordinator representing the Generating Unit, System Unit or System Resource for the Ancillary Service capacity used to supply Uninstructed Imbalance Energy ~~and for Energy supplied from such capacity shall be~~ eliminated to the extent of the deficiency, except to the extent (i) the deficiency in the availability of Ancillary Service capacity from the Generating Unit, System Unit or System Resource is attributable to control exercised by the ISO in that BEEP Interval through AGC operation, an RMR Dispatch Notice, or dispatch to avoid an intervention in Market operations or to prevent a System Emergency; or (ii) a penalty is imposed under Section 2.5.26.1 with respect to the deficiency.

**2.5.26.2.2** If the metered Demand of a Curtailable Demand is insufficient to deliver the full amount of the Non-Spinning and Replacement Reserve to which that Curtailable Demand is obligated in that BEEP Interval, then the related capacity payments will be rescinded to the extent of that deficiency as explained in Section 2.5.26.2.4 and 2.5.26.2.5, unless a penalty is imposed on that Curtailable Demand for that BEEP Interval under Section 2.5.26.1.

**2.5.26.2.3** ~~The payment for Energy to be eliminated shall be determined in accordance with Section 11.2.4.1.~~ **[Not Used]**

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**2.5.26.2.6** For each BEEP Interval in which a Generating Unit, Curtailable Demand, System Unit or System Resource fails to **actually** supply Energy from Spinning Reserve, Non-Spinning Reserve or Replacement Reserve capacity in accordance with a Dispatch instruction, or supplies only a portion of the Energy specified in the Dispatch Instruction, the capacity payment will be pro-rated to reflect the unavailability in that BEEP Interval of the difference between (1) the total MW of the particular Ancillary Service scheduled in that Settlement Period and (2) the amount of Energy, if any, supplied in response to the Dispatch instruction in that BEEP Interval.

**2.5.26.3 Rescission of Payments When Dispatch Instruction is Not Followed**

If the total metered output of a Generating Unit, Curtailable Demand, System Unit or System Resource is insufficient to ~~deliver~~ **supply** the amount of Instructed Imbalance Energy associated with a Dispatch instruction issued in accordance with a bid on Spinning Reserve, Non-Spinning Reserve, or Replacement Reserve in any BEEP Interval, then the capacity payment associated with the difference between the total scheduled amount of each Ancillary Service for which Insufficient Energy was delivered, and the actual output attributed to the response to the Dispatch instruction on each Ancillary Service, shall be rescinded. However, no capacity payment shall be rescinded if the shortfall in the metered output of the Generating Unit, Curtailable Demand, System Unit, or System Resource is less than a deadband amount published by ISO on the ISO Home Page at least twenty-four hours prior to the BEEP Interval. For any BEEP Interval with respect to which no deadband amount has been published by the ISO, the deadband amount shall be zero MWH. If the Generating Unit, Curtailable Demand, System Unit or System Resource is scheduled to provide more than one Ancillary Service in the Settlement Period, then the actual output will be attributed first to Replacement Reserve, then to Non-Spinning Reserve, and finally to Spinning Reserve, and the capacity payments associated with the balance of each Ancillary Service shall be rescinded. If the same Ancillary Service is scheduled in both the Day Ahead and Hour Ahead Markets, then payments shall be rescinded in proportion to the amount of each Ancillary Service scheduled in each market.

**2.5.26.4** Penalties applied pursuant to Section 2.5.26.1, and payments rescinded pursuant to Section 2.5.26.2 and 2.5.26.3 shall be redistributed to Scheduling Coordinators in proportion to ISO Control Area metered Demand and ~~scheduled exports~~ for the same Trading Day.

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**5.6.3.2** A Participating Generator shall not be subject to penalties pursuant to Section 5.6.3.1 if the Participating Generator can demonstrate to the ISO that it failed to comply with such a Dispatch instruction either because: (a) the Generating Unit, System Unit or System Resource that was the subject of the Dispatch instruction was physically incapable of responding in accordance with the instruction, provided that if such Participating Generator has not notified the ISO in advance that the Generating Unit, System Unit or System Resource was unavailable or de-rated, such Generating Unit, System Unit or System Resource will be presumed to be available; or (b) compliance with such Dispatch instruction would have resulted in a violation of an applicable requirement of state or Federal law, which requirement cannot be waived. A Participating Generator must notify ISO operations staff of its reason for failing to comply with the Dispatch instruction ~~within the operating hour that the instruction is issued~~ **in accordance with Section 2.3.3.9.2** and must provide information to the ISO that verifies the reason the Participating Generator failed to comply with the Dispatch instruction within 72 hours of the operating hour in which the instruction is issued. Disputes concerning the cause of a Participating Generator's failure to comply with an ISO Dispatch instruction shall be subject to the Dispute Resolution provisions set forth in Section 13 of this ISO Tariff.

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**11.2.4.1.2 Penalties for Uninstructed Imbalance Energy**

**The ISO shall charge Scheduling Coordinators Uninstructed Deviation Penalties for Uninstructed Imbalance Energy resulting from resource deviations outside a tolerance band from their Dispatched Operating Point, for dispatched resources, or their final Hour-Ahead Schedule otherwise. The Dispatched Operating Point will take into account the expected ramping of a resource as it moves to a new Hour-Ahead Schedule at the top of each hour and as it responds to Dispatch instructions. The Uninstructed Deviation Penalty will be applied as follows:**

- a) The Uninstructed Deviation Penalty will be calculated and assessed in each BEEP Interval in hours that Section 5.6.3 is not in effect; the ISO has not declared a Staged System Emergency; or parts of hours except when Section 5.6.3 is in effect;
- b) The Uninstructed Deviation Penalty will apply to Interconnection Schedules if a pre-dispatch instruction is declined or not delivered. However, uninstructed energy resulting from declining intra-hour instructions will not be subject to Uninstructed Deviation Penalty. Dynamic Interconnection Schedules, to the extent they deviate without instruction from their final Hour-Ahead Schedule, and real-time instructions for Energy from Interconnection Schedule bids that are declined, will be subject to the Uninstructed Deviation Penalty;
- c) The Uninstructed Deviation Penalty will not apply to Load, other than Participating Load; for Participating Load, the Uninstructed Deviation Penalty will not apply for the duration of the relevant Minimum Down Time;
- d) The Uninstructed Deviation Penalty will not apply to constrained resources for the duration of the relevant startup/shutdown and Minimum Up/Down Times;
- e) The Uninstructed Deviation Penalty will not apply to Regulatory Must-Run Generation or Participating Intermittent Resources that meet the scheduling obligations established in the technical standards for Participating Intermittent Resources adopted by the ISO and published on the ISO Home Page or Regulatory Must-Run Generation. No other applicable charges will be affected by this exemption. Uninstructed Deviation Penalty also will not apply to Qualifying Facilities that have not executed a Participating Generator Agreement (PGA), pending resolution of QF-PGA issues at the Commission;
- f) For Metered Subsystems (MSS), the Uninstructed Deviation Penalty will apply to the net injection (System Unit generation plus import minus MSS load and export) into the ISO Controlled Grid;

- g) The Uninstructed Deviation Penalty will not apply to Generators providing Regulation to the extent that the Generators' Uninstructed Deviations are within the range of their actual Regulation range;**
- h) The Uninstructed Deviation Penalty will be calculated and assessed for each resource separately, however, resources represented by the same Scheduling Coordinator and connected to the same ISO Controlled Grid bus and voltage level can be aggregated for purposes of Uninstructed Deviation Penalty determination. Other levels of aggregation for purposes of the Uninstructed Deviation Penalty will be considered on a case-by-case basis based on an ISO review of impact on the ISO Controlled Grid;**
- i) The tolerance band for the application of the Uninstructed Deviation Penalties to Generators or aggregated Generators initially will be the Energy produced in a BEEP Interval by the greater of five (5) MW or three percent (3%) of the relevant generating unit's maximum output ( $P_{max}$ ), as registered in the Master File;**
- j) The tolerance band for the application of the Uninstructed Deviation Penalties to Participating Loads initially will be equal to the Energy produced in a BEEP Interval by the greater of five (5) MW or three percent (3%) of the relevant final Hour-Ahead Schedule;**
- k) The Uninstructed Deviation Penalty will not apply when the BEEP Interval Ex Post Price is negative or zero;**
- l) The Uninstructed Deviation Penalty for positive Uninstructed Imbalance Energy will be the amount of the Uninstructed Imbalance Energy in excess of the tolerance band multiplied by a price that initially will be equal to 100% of the corresponding BEEP Interval Ex Post Price; and the net effect of the Uninstructed Deviation Penalty and the Settlement for positive Uninstructed Imbalance Energy beyond the tolerance band will be that the ISO will not pay for such Energy;**
- m) The Uninstructed Deviation Penalty for negative Uninstructed Imbalance Energy will be the amount of the Uninstructed Imbalance Energy in excess of the tolerance band**

multiplied by a price that initially will be initially equal to 50% of the corresponding BEEP Interval Ex Post Price; and the net effect of the Uninstructed Deviation Penalty and Uninstructed Imbalance Energy settlement initially will be that any such Energy will be charged at 150% of the corresponding BEEP Interval Ex Post Price;

- n) The Uninstructed Deviation Penalty will not apply to deviations from Energy delivered as part of a scheduled test so long as the test has been scheduled by the Scheduling Coordinator with the ISO or the ISO has initiated as test for the purposes of validating unit performance;
- o) The Uninstructed Deviation Penalty will apply to Out of Market (OOM) transactions;
- p) Generating Units, Curtailable Demands and dispatchable Interconnection resources with negative Uninstructed Imbalance Energy will be exempted from the Uninstructed Deviation Penalty if the Generating Unit, Curtailable Demand or dispatchable Interconnection resource was physically incapable of delivering the expected Energy, provided that the Generating Unit, Curtailable Demand or dispatchable Interconnection resource had notified the ISO within 30 minutes of the onset of an event that prevents the resource from performing its obligations. A Generating Unit, Curtailable Demand or dispatchable Interconnection resource must notify ISO operations staff of its reasons for failing to deliver the expected Energy in accordance with Section 2.3.3.9.2 and must provide information to the ISO that verifies the reason the resource failed to comply with the Dispatch instruction within 72 hours of the operating hour in which the instruction is issued ; and
- g) Operational adjustments associated interchange schedules making use of existing contract rights shall not be subject to uninstructed deviation penalty.

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Dispatch Instruction

An instruction by the ISO to a resource for increasing or decreasing its energy supply or demand from the Hour-



**Ahead Schedule to a specified operating point.**

**Dispatch Operating Point**

**The expected operating point of a resource that has received a Dispatch Instruction. The resource is expected to operate at the Dispatch Operating Point after completing the Dispatch Instruction, taking into account any relevant ramp rate and time delays. Energy expected to be produced or consumed above or below the Final Hour-Ahead Schedule in response to a Dispatch Instruction constitutes Instructed Imbalance Energy. For resources that have not received a Dispatch Instruction, the Dispatch Operating Point defaults to the corresponding Final Hour-Ahead Schedule.**

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**Uninstructed Deviation Penalty**

**The penalty as set forth in Section 11.2.4.1.2 of this ISO Tariff.**

# **Attachment J**

## **EXTENSION OF COMMISSION MITIGATION MEASURES**

### **~~31. EXPIRATION OF COMMISSION MITIGATION MEASURES~~**

~~The limitations on prices specified in Sections 2.5.22, 2.5.23, and 2.5.27, and the must-offer obligation specified in Section 5.11, shall expire on September 30, 2002.~~



# **Attachment K**

## 12 Month Competitiveness Index

### 2.5.23.3.7.6 Submission of Start-Up Fuel Cost Invoices

Scheduling Coordinators for Must-Offer Generators that incur Start-Up Fuel Costs as a direct result of an ISO Dispatch instruction before October 1, 2002 ~~or if the ISO revokes a waiver from compliance with the must offer obligation while the unit is off line in accordance with Section 5.11.6 of this ISO Tariff~~ may submit to the ISO an invoice in the form specified on the ISO Home Page (the "Start-Up Fuel Cost Invoice") for the recovery of such Start-Up Fuel Costs. Such Start-Up Fuel Costs shall not exceed the costs which would be incurred within the start-up time for a unit specified in Schedule 1 of the Participating Generator Agreement. Start-Up Fuel Cost Invoices shall use the applicable proxy figure for natural gas costs as determined in accordance with Section 2.5.23.3.4 and posted on the ISO Home Page. Start-Up Fuel Cost Invoices shall not include any Start-Up Fuel Costs specified in an RMR Contract for a unit owned or controlled by a Must-Offer Generator.

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### 2.5.23.3.8.2 ~~Data Requirements to Be Eligible~~ Establish Eligibility to Establish the BEEP Interval Ex Post Price, Marginal Proxy Clearing Price, or Non-Emergency Clearing Price

Scheduling Coordinators for generating units not contained within the metered boundaries of the ISO Control Area that seek to be eligible to set the BEEP Interval Ex Post Price, Marginal Proxy Clearing Price, or Non-Emergency Clearing Price must meet the requirements set forth in the ISO's "Monitoring and Communications Requirements for Generating Units Providing Only Energy and Supplemental Energy" as posted on the ISO Home Page. Scheduling Coordinators for generating units not contained within the metered boundaries of the ISO Control Area that seek to be eligible to set the BEEP Interval Ex Post Price, Marginal Proxy Clearing Price, or Non-Emergency Clearing Price must provide the ISO, for each such generating unit, with: 1) a unique interchange identifier that refers to the generating unit; and 2) the heat rate data set forth in Section ~~5.12 2.5.23.3.3~~ before those units will be eligible to set the BEEP Interval Ex Post Price, Marginal Proxy Clearing Price, or Non-Emergency Clearing Price.

Scheduling Coordinators for generating units not contained within the metered boundaries of the ISO Control Area that seek to be eligible to set the BEEP Interval Ex Post Price, Marginal Proxy Clearing

Price<sub>1</sub> or Non-Emergency Clearing Price must provide the ISO with Settlement Quality Meter Data for each BEEP Interval in that Trade Day and other Settlement Quality Meter Data the ISO may deem necessary to verify the generating unit's performance. Scheduling Coordinators shall submit these data, using the template posted on the ISO Home Page for this purpose, no later than 30 calendar days after the Trade Day in which the Energy was provided.

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**28. TEMPORARY RULES LIMITING DISQUALIFYING CERTAIN ENERGY AND ANCILLARY SERVICE BIDS**

**~~28.1 — Application and Termination~~**

~~The temporary change disqualifying certain Energy and Ancillary Service bids set out in Section 28.2 shall continue in effect until November 15, 2000, unless its effectiveness is extended by order of the FERC.~~

**~~28.2 — Disqualification of Certain Energy and Ancillary Service Bids~~**

~~The ISO may establish price levels for the Imbalance Energy market and/or for any Ancillary Service market above which any bid for a Settlement Period to which the price level applies will be rejected. The ISO shall establish such price levels in accordance with criteria adopted by the ISO Governing Board from time to time and shall publish such price levels on WEnet or the ISO Home Page in advance of the first Settlement Period for which the ceiling price levels apply.~~

**28.1 [NOT USED]**

**28.1.1 [NOT USED]**

**28.1.2 [NOT USED]**

**28.1.3 [NOT USED]**

**28.1.4 Negative Bids**

**Negative bids into the ISO Markets shall be limited to -\$30/MWh (minus thirty dollars per MWh).**

**28.1.5 [NOT USED]**

## **28.2 12-Month Market Competitiveness Index**

**The ISO shall compute a 12-month rolling average Market Competitiveness Index as specified in section 28.2.1 and evaluate that computation against the threshold defined in Section 28.2.1.6. If and when the trigger threshold is exceeded, the mitigation measures specified in Section 28.2.3 will apply for the lesser of: (1) 6 months or (2) until FERC has determined that the market has been restored to competitive conditions. The initial Non-Emergency Clearing Price Limit shall be that last in effect.**

### **28.2.1 Tracking by DMA**

**The ISO Department of Market Analysis will compute a 12-Month Market Competitiveness Index (12MMCI) at the end of each month for the previous 12 months.**

**28.2.1.1 The 12MMCI is a 12-month rolling price-cost markup index that compares actual average market cost (AAMC) as specified in Section 28.2.1.2 to a competitive baseline average cost (CBAC) as specified in Section 28.2.1.3, using the following formula:**

$$\mathbf{12MMCI = (AAMC - CBAC).}$$

**28.2.1.2 Computation of the AAMC. The actual average market cost is computed as the weighted average of short-term forward and real-time energy prices.**

- 1. The short-term forward energy prices and quantities use the day-ahead and hour-ahead energy market if one is in place. In the absence of forward energy market, the California Energy Resource Scheduler (CERS) day-ahead and hour-ahead scheduled quantities and the corresponding short-term contract prices will be used.**
- 2. The real-time prices and quantities pertain to the real-time incremental dispatch instructions issued by the ISO.**
- 3. The hourly total MWh quantity of the above short-term forward energy and real-time incremental energy will be used as the quantity for calculating total hourly competitive baseline market costs as described in Section 28.2.1.4.**



**28.2.1.3 Computation of the CBAC. The competitive baseline average cost is based on competitive baseline prices that represent the estimated variable operating cost of the marginal (highest cost) thermal generation unit within the ISO system needed to meet system demand each hour. The calculation procedure is as follows:**

- 1. The actual supply from Final Hour-ahead net import schedules, Utility Retained Generation (URG), and other must-take resources within the ISO Control Area are excluded from the computation (i.e. netted out from both supply and demand) for each hour.**
- 2. The operating costs of major non-utility owned thermal generating units within the ISO system are estimated based on unit heat rates, spot market gas prices, opportunity costs for certain energy limited resources, and estimated variable O&M costs of \$4/MWh for combustion turbines and \$2/MWh for other thermal units.**
- 3. Only the available capacity of the generating units (considering partial or total outages based on ISO's outage coordination database) are used.**
- 4. A thermal supply curve is developed based on the available capacity of non-utility owned thermal units and their average heat rate.**
- 5. A composite supply curve is constructed by combining the thermal supply curve of Step 4 with real-time import bids that were dispatched, at their bid price, and any out-of-market purchases capped at a price corresponding to a 12,000 MMBTU heat rate (plus the O&M adder)**
- 6. The net demand that must be met by these sources of supply is calculated for each hour t as follows:**

$$\text{Net Demand}_t = \text{System Energy Demand}_t - \text{HA Net Imports}_t \\ - \text{Residual ISO Supply}_t \\ - \text{Estimated System Losses and Unaccounted for Energy}_t$$

where:

$$\text{System Energy Demand}_t = 1.07 * \text{Actual ISO System Load}_t$$

+ Upward Regulation Requirements<sub>t</sub>

HA Net Imports<sub>t</sub> = SUM<sub>i</sub> (Final Hour Ahead Energy Schedule<sub>i,t</sub> )

Residual ISO Supply<sub>t</sub> = SUM<sub>j</sub> ( Max [Metered Output<sub>i,t</sub>,  
Final Hour Ahead Energy Schedule<sub>j,t</sub>  
+ Upward Regulation Capacity Scheduled<sub>j,t</sub>  
+ Real Time Energy Dispatched<sub>i,t</sub>  
+ RMR Schedule Change<sub>j,t</sub> ] )

i = All Hour-ahead net import schedules into the ISO control area

j = All generating resources within the ISO control area other than non-utility thermal units

**7. System losses and Unaccounted For Energy in each hour t are estimated using the difference between: (1) hourly system loads reported by the ISO based on telemetered data and (2) the sum of estimated generation from all sources within the ISO control area plus final (Hour-Ahead) import schedules.**

**8. A competitive baseline price is calculated based on the supply curve of non-utility thermal generating units and real-time energy import bids and the net demand that must be met from these sources of supply.**

**9. For energy-limited resources, estimates of opportunity cost shall be used in computing the competitive baseline cost as described below.**

**A) Unit owners shall report to the ISO Outage Coordination office when energy-limited resources are not available (for example, once a unit has used up its energy production or its available hours). Annual environmental limitations shall be reported to the ISO Outage Coordination office. The unit will then be flagged so that it is not considered to be physically withholding. Once flagged, the unit will not be included in the calculation of the competitive baseline cost for the relevant period.**

**B) The opportunity cost for an energy-limited generation resource is calculated based on the maximum available hours during the constrained**

period and the corresponding price on the price duration curve of the hourly competitive baseline prices for the constrained period. The estimated opportunity cost for the energy-limited generation resource will remain constant for all hours in this constrained period. The opportunity cost may be increased to account for other constraints on the resource.

**10. The Hourly Competitive Baseline Cost is the product of:**

**A) the competitive baseline price defined in this section, and**

**B) the total short-term and real-time incremental Energy defined in 28.2.12.**

**28.2.1.4 Computation of the Price-cost Markup.**

**The Price-cost markup shall be :**

$$\frac{\text{SUM}_h(\text{Hourly Actual Market Cost}) - \text{SUM}_h(\text{Hourly Competitive Baseline Cost})}{\text{SUM}_h(\text{Hourly Competitive Baseline Cost})}$$

**where h is each hour in the month;**

**The 12-Month Market Competitiveness Index (12MMCI) is computed as:**

$$\frac{\text{SUM}_M(\text{Monthly Actual Market Cost}) - \text{SUM}_M(\text{Monthly Competitive Baseline Cost})}{\text{SUM}_M(\text{Monthly Competitive Baseline Cost})}$$

**where M is each month of the previous 12 months.**

**28.2.1.5 Accounting for Scarcity Rents. To assess the degree to which high prices may be attributable to absolute scarcity of supply rather than market power, the DMA shall identify the portion of the price-cost markup that occurred during hours of potential resource scarcity. In this analysis, scarcity shall be defined to occur during the hours when the total available supply in the ISO system (including import bids and out-of-market purchases) is less than total system demand for energy plus a margin of 10 percent approximating requirements for three percent upward regulation and seven percent Operating Reserves).**

**28.2.1.6 Trigger Threshold.**

**The threshold for the 12MMCI shall be \$5/MWh.**

**28.2.2 POSTING**

**The ISO shall calculate and publish the 12MMCI every month.**

**28.2.3 CONSEQUENCES FOR EXCEEDING THE 12MMCI**

**If the threshold for the 12MMCI is exceeded, then the requirements of Sections 28.2.3.1, 28.2.3.2, 28.2.3.3, and 28.2.3.4 shall apply.**

**28.2.3.1 Temporary Limitation of BEEP Prices Resulting from 12-Month Trigger**

**28.2.3.1.1 Limitation**

**Notwithstanding any other provision of the ISO Tariff, including Section 2.5.23.3.1.2, the BEEP Interval Ex Post Price shall equal the highest Proxy Price calculated in accordance with Section 28.2.3.1.4 for a gas-fired Generating Unit that: (i) is eligible to set the Market Clearing Price as set forth in Section 28.2.3.1.8; and (ii) is dispatched by the ISO to provide Imbalance Energy. This Proxy Price shall establish the Market Clearing Price (the "Marginal Proxy Clearing Price") for all Scheduling Coordinators for Generating Units, System Units, and System Resources that submit bids at or below the level of the Marginal Proxy Clearing Price. All bids for the supply of Imbalance Energy submitted by Scheduling Coordinators for resources that do not meet the requirements set forth in Section 28.2.3.1.8 to be eligible to set the Market Clearing Price shall be bids deemed by the ISO to be paid the Marginal Proxy Clearing Price. Subject to Section 28.2.3.1.8, Scheduling Coordinators for Generating Units, System Units, and System Resources that submit bids above the Marginal Proxy Clearing Price for the supply of Imbalance Energy shall be paid in accordance with their bids if accepted for Dispatch by the ISO. Such bids shall be subject to the cost justification requirements and potential refunds as set forth in Section 2.5.23.3.5.**

**28.2.3.2 Limitation for Ancillary Services Prices**

Notwithstanding any other provision of the ISO Tariff, the Market Clearing Prices for Regulation Up, Regulation Down, Spinning Reserves, Non-Spinning Reserves, and Replacement Reserves shall not exceed the Hourly Ex Post Price in effect at the deadline for submitting bids to that market, as determined in accordance with Section 28.2.3.1.1.1. Subject to Section 28.2.3.2.4 of this ISO Tariff, Scheduling Coordinators for Generating Units, System Units, Loads, and System Resources that submit bids above the Hourly Ex Post Price in effect at the deadline for submitting bids to that market for the supply of these Ancillary Services shall be paid in accordance with their bids if accepted by the ISO. Such bids shall be subject to cost justification requirements and potential refunds.

#### 28.2.3.3 Residual Unit Commitment and Must Offer

The ISO's residual unit commitment process specified in Section 5.12 and the requirements for Generating Units to offer Available Generation in Section 5.11 will continue to apply during the period that the mitigation measures specified in this Section 28.2 are in effect.

#### 28.2.3.4 Notification to the Commission

It the 12MMCI threshold in Section 28.2.1 is exceeded, the ISO will, in addition to the restitution of the California-only mitigation measures contained in Section 28.2.3.1, 28.2.3.2, and 28.2.3.3, notify the Commission as soon as is practical and request the Commission re-institute the West-wide mitigation components of its June 19, 2001 Order in Docket No. EL00-95. The ISO shall also request that, to the extent not already provided, FERC establish liability for refunds in future periods based on the principles provided for in FERC's June 19 2001 Order until FERC makes a finding that rates are just and reasonable.



# **Attachment L**

Real-Time market, shall use Energy Bids that are no higher than the Energy Bids used in the Residual Unit Commitment Process. Submitted Energy Bids shall be subject to the Damage Control Bid Cap as set forth in Section 28.1 and to the Mitigation Measures set forth in Appendix A to the Market Monitoring and Information Protocol.

**5.13.2.3 Energy Bid Partition.** The portion of the Energy Bid that corresponds to the high end of the resource's operating range, shall be allocated to any awarded or self-provided Ancillary Services in the following order from higher to lower capacity: (a) Regulation Up; (b) Spinning Reserve; (c) Non-Spinning Reserve; and (d) Replacement Reserve. For resources providing Regulation Up, the upper regulating limit shall be used if it is lower than the highest operating limit. The remaining portion of the Energy Bid shall constitute a Bid to provide Supplemental Energy.



which this Section 27 shall cease to apply, which date shall not be less than seven (7) days after the Notice of Full-Scale Operations is posted.

**27.2** For so long as this Section 27.2 remains in effect, Scheduling Coordinators shall continue to be allowed to specify Adjustment Bids for Dispatchable Loads and exports, conditioned on the rule that the last segment of the Adjustment Bid (i.e., the maximum MW value) must equal the preferred MW operating point specified for the Dispatchable Load or export.

## **28. RULES LIMITING CERTAIN ENERGY AND ANCILLARY SERVICE BIDS**

### **28.1 Damage Control Bid Cap**

**28.1.** Notwithstanding any other provision of this ISO Tariff, the ISO shall reject any bid into the ISO's Energy and Ancillary Service capacity markets that exceed the levels specified in Section 28.1.2 and 28.1.4.

**28.1.2** The maximum bid level shall be \$108/MWh, based on a proxy figure for natural gas cost of \$6.641/MMBtu, a \$6.00 adder for variable operations and maintenance costs and an incremental heat rate of 15,360 Btu/kwh. The maximum bid level shall be recalculated when the proxy figure for natural gas costs determined in accordance with the Commission's December 19, 2001 Order Temporarily Modifying the West Wide Mitigation Methodology in Docket No. EL01-68-000 by utilizing the current average of the mid-point for the monthly bid-week index prices reported for SoCal Gas (large packages), Malin and PG&E city-gate in differs from the proxy figure for natural gas costs used to calculate the maximum bid level by more than ten percent, though the maximum bid level shall not be less than \$108/MWh.

**28.1.3** The ISO will determine the amount specified in Section 28.1 on a monthly basis and publish the amount on the ISO Home Page in advance of the month to which the maximum bid level applies.

**28.1.4 Negative Bids**

Negative bids into the ISO Markets shall be limited to  $-\$30/\text{MWh}$  (minus thirty dollars per MWh).

**28.1.5** The limitation in this section 28.1 shall not apply if and when the 12 month trigger in section 28.2 has been exceeded and the mitigation in 28.2.3 is in effect.

**29. [NOT USED]**

**30. YEAR 2000 COMPLIANCE**

**30.1 Y2K Compliance**

"Y2K Compliance" or "Y2K Compliant" means hardware, software, firmware, or other systems or processes (hereafter "systems and processes") that correctly manage, calculate, compare and sequence date data from, into and between the 20<sup>th</sup> and 21<sup>st</sup> centuries, including leap year calculations, without human intervention. Y2K Compliant systems and processes must utilize input and output date formats that are compatible with the ISO's systems and processes, must conform to the International Organization for Standardization ISO 8601:1988 standards for representation of dates and must not cause incorrect date calculations.

## APPENDIX A

### ISO Market Monitoring Plan

#### Market Mitigation Measures

#### 1 PURPOSE AND OBJECTIVES

1.1 These ISO market power mitigation measures ("Mitigation Measures") are intended to provide the means for the ISO to mitigate the market effects of any conduct that would substantially distort competitive outcomes in the ISO Real Time Market and Residual Unit Commitment Process while avoiding unnecessary interference with competitive price signals. These Mitigation Measures are intended to minimize interference with an open and competitive market, and thus to permit, to the maximum extent practicable, price levels to be determined by competitive forces under the prevailing market conditions. To that end, the Mitigation Measures authorize the mitigation only of specific conduct that exceeds well-defined thresholds specified below.

1.2 In addition, the ISO shall monitor the markets it administers for conduct that it determines constitutes an abuse of market power but does not trigger the thresholds specified below for the imposition of mitigation measures by the ISO. If the ISO identifies any such conduct, and in particular conduct exceeding the thresholds for presumptive market effects specified below, it shall make a filing under Section 205 of the Federal Power Act, 16 U.S.C. § 824d, with the Commission requesting authorization to apply appropriate mitigation measures. Any such filing shall identify the particular conduct the ISO believes warrants mitigation, shall propose a specific mitigation measure for the conduct, and shall set forth the ISO's justification for imposing that mitigation measure.

## **1.2 CONDUCT WARRANTING MITIGATION**

### **2.1 Definitions**

The following definitions are applicable to this Appendix A:

"Economic Market Clearing Prices" are the market clearing prices for a particular resource at the location of that particular resource at the time the resource was either Scheduled or was Dispatched by the ISO. Economic Market Clearing Prices may originate from the Day-ahead Energy market, the Hour-ahead Energy market (when these markets are in place), or ISO Real-time Imbalance Energy market. The Economic Market Clearing Price for the ISO Real Time Imbalance Energy Market shall be the BEEP Interval Ex Post Price, unless the resource cannot change output level within the hour (i.e., the resource is not amenable to intra-hour real-time dispatch instructions), or it is a System Resource. Economic Market Clearing Prices for the ISO Real Time Imbalance Energy Market for resources that cannot change output level within one BEEP Interval and System Resources shall be the simple average of the six BEEP Interval Ex Post Prices for each hour.

"Electric Facility" shall mean an electric resource, including a Generating Unit, System Unit, Participating Load or a System Resource.

### **2.2 Conduct Subject to Mitigation**

Mitigation Measures may be applied: (i) to the bidding, scheduling, or operation of an "Electric Facility"; or (ii) as specified in section 2.4 below.

### **2.3 Conditions for the Imposition of Mitigation Measures**

**2.3.1** In general, the ISO shall consider a Market Participant's conduct to be inconsistent with competitive conduct if the conduct would not be in the economic interest of the Market Participant in the absence of market power. The categories of conduct that are inconsistent with competitive conduct include, but may not be limited to, the three categories of conduct specified in Section 2.4 below.

## **2.4 Categories of Conduct that May Warrant Mitigation**

**2.4.1** The following categories of conduct, whether by a single firm or by multiple firms acting in concert, may cause a material effect on prices or generally the outcome of an ISO Real Time Market or Residual Unit Commitment process if exercised from a position of market power. Accordingly, the ISO shall monitor the ISO Markets for the following categories of conduct, and shall impose appropriate Mitigation Measures if such conduct is detected and the other applicable conditions for the imposition of Mitigation Measures are met:

- (1) Physical withholding of an Electric Facility, in whole or in part, that is, not offering to sell or schedule the output of or services provided by an Electric Facility capable of serving an ISO Market. Such withholding may include, but not be limited to: (i) falsely declaring that an Electric Facility has been forced out of service or otherwise become totally or partially unavailable, (ii) refusing to offer bids or schedules for an Electric Facility when it would be in the economic interest, absent market power, of the withholding entity to do so, (iii) declining real-time bids called upon by the ISO (unless the ISO is informed in accordance with established procedures that the relevant resource for which the bid is submitted has undergone a forced outage or derate), or (iv) operating a Generating Unit in real-time to produce an output level that is less than the ISO's Dispatch instruction.
- (2) Economic withholding of an Electric Facility, that is, submitting bids for an Electric Facility that are unjustifiably high (relative to known operational characteristics and/or the known operating cost of the resource) so that: (i) the Electric Facility is not or will not be dispatched or scheduled, or (ii) the bids will set a market clearing price.
- (3) Uneconomic production from an Electric Facility, that is, increasing the output of an Electric Facility to levels that would otherwise be uneconomic in order to cause, and obtain benefits from, a transmission constraint.

**2.4.2** Mitigation Measures may also be imposed to mitigate the market effects of a rule, standard, procedure, design feature, or known software imperfection of an ISO Market that allows a Market Participant to manipulate market prices or otherwise impair the efficient operation of that market, pending the revision of such rule, standard, procedure design feature, or software defect to preclude such manipulation of prices or impairment of efficiency.

**2.4.3** Taking advantage of opportunities to sell at a higher price or buy at a lower price in a market other than an ISO Market shall not be deemed a form of withholding or otherwise inconsistent with competitive conduct.

**2.4.4** The ISO shall monitor ISO Markets for other categories of conduct, whether by a single firm or by multiple firms acting in concert, that have material effects on prices in an ISO Market or other payments. The ISO shall: (i) seek to amend the foregoing list as may be appropriate to include any such conduct that would substantially distort or impair the competitiveness of any of the ISO Markets; and (ii) seek such other authorization to mitigate the effects of such conduct from the FERC as may be appropriate.

### **3 CRITERIA FOR IMPOSING MITIGATION MEASURES**

#### **3.1 Identification of Conduct Inconsistent with Competition**

Conduct that may potentially warrant the imposition of a mitigation measure includes the categories described in Section 2.4 above. The thresholds listed in section 3.1.1 below shall be used to identify substantial departures from competitive conduct indicative of an absence of workable competition.

##### **3.1.1 Conduct Thresholds for Identifying Economic Withholding**

The following thresholds shall be employed by the ISO to identify economic withholding that may warrant the mitigation of the bid from a resource and shall be determined with respect to a reference level determined as specified in Section 3.1.2:

Energy Bids: a 100 percent increase or \$50/MWh increase in the bid, whichever is lower.

### 3.1.1.1 Reference Levels

(a) For purposes of establishing reference levels, bid segments shall be defined as follows:

1. the capacity of each generation resource shall be divided into 10 equal Energy bid segments between its minimum ( $P_{min}$ ) and maximum ( $P_{max}$ ) operating point.
2. for Energy bids submitted over the intertie Scheduling Points (import bids), 10 bid segments shall be established for each Scheduling Coordinator at each Scheduling Point based on historical volumes over the preceding 12 months.

A reference level for each bid segment shall be calculated for peak and off-peak periods on the basis of the following methods, listed in the following order of preference subject to the existence of sufficient data, where sufficient data means at least one data point per time period (peak or off-peak) for the bid segment.

Peak periods shall be the periods Monday through Saturday from Hour Ending 0700 through Hour Ending 2200, excluding holidays. Off-Peak periods are all other hours.

1. The lower of the mean or the median of a resource's accepted bids in competitive periods over the previous 90 days for peak and off-peak periods, adjusted for changes in fuel prices using the proxy figure for natural gas prices posted on the ISO Home Page;
2. If the resource is a gas-fired unit that does not have significant energy limitations, the unit's default energy bid as set forth in Section 5.12 (based on the incremental heat rate submitted to the ISO, adjusted for gas prices, and the variable O&M cost on file with the ISO, or the default O&M cost of \$6/MWh).
3. For non gas-fired units and gas-fired units that have significant energy limitations, a level determined in consultation with the Market Participant submitting the bid or bids at issue, provided such consultation has occurred prior to the occurrence of the conduct

being examined by the ISO, and provided the Market Participant has provided sufficient data on a unit's energy limitations and operating costs (opportunity cost for energy limited resources) in accordance with specifications provided by the ISO.

4. The mean of the Economic Market Clearing Prices for the units' relevant location (zone or node commensurate with the pricing granularity in effect) during the lowest-priced 25 percent of the hours that the unit was dispatched or scheduled over the previous 90 days for peak and off-peak periods, adjusted for changes in fuel prices; or
  5. If sufficient data do not exist to calculate a reference level on the basis of the first, second, or fourth methods and the third method is not applicable or an attempt to determine a reference level in consultation with a Market Participant has not been successful, the ISO shall determine a reference level on the basis of:
    - i. the ISO's estimated costs of an Electric Facility, taking into account available operating costs data, opportunity cost, and appropriate input from the Market Participant, and the best information available to the ISO; or
    - ii. an appropriate average of competitive bids of one or more similar Electric Facilities.
- (b) The reference levels (\$/MWh bid price) for the different bid segments of each resource (or import bid curve of a Scheduling Coordinator at a Scheduling Point) shall be made monotonically non-decreasing by the ISO by proceeding from the lowest MW bid segment moving through each higher MW bid segment. The reference level of each succeeding bid segment shall be the higher of the reference level of the preceding bid segment or the reference level determined according to paragraph (b) above.



### **3.2 Material Price Effects**

#### **3.2.1 Market Impact Thresholds**

In order to avoid unnecessary intervention in the ISO Market, Mitigation Measures for economic withholding shall not be imposed unless conduct identified as specified above causes or contributes to a material change in one or more of the ISO market-clearing prices (MCPs). Initially, the thresholds to be used by the ISO to determine a material price effect shall be an increase of 100 percent or \$50 per MWh, whichever is lower, in the MCP at any location (zone or node) commensurate with the relevant pricing structure in effect in accordance with the ISO Tariff.

#### **3.2.2 Price Impact Analysis**

The ISO shall determine the effect on prices of questioned conduct through automated computer modeling and analytical methods. An Automatic Mitigation Procedure (AMP) shall identify bids that have exceeded the conduct thresholds and shall compute the change in MCPs as a result of simultaneously setting all such bids to their Reference Levels. If a change in the MCP exceeds the Impact threshold stated in Section 3.2.1, those bids would be kept mitigated at their default bid levels as specified in Section 4.2.2 below.

#### **3.2.3 Section 205 Filings**

In addition, the ISO shall make a filing under Section 205 of the Federal Power Act with the Commission seeking authorization to apply an appropriate mitigation measure to conduct that departs significantly from the conduct that would be expected under competitive market conditions but does not rise to the thresholds specified in section 3.1.1 above, unless the ISO determines, from information provided by the Market Participant or Parties that would be subject to mitigation or other information available to the ISO that the conduct is attributable to legitimate competitive market forces or incentives. The following are examples of conduct that are deemed to depart significantly from the conduct that would be expected under competitive market conditions:

- (1) bids that vary with unit output in a way that is unrelated to the known performance characteristics of the unit, or
- (2) bids that vary over time in a manner that appears unrelated to the change in the unit's performance or to changes in the supply environment that would induce additional risk or other adverse shifts in the cost basis.

The conducts listed above are intended to be examples rather than a comprehensive list.

### **3.3 Consultation with a Market Participant**

If a Market Participant anticipates submitting bids in an ISO market administered by the ISO that will exceed the thresholds specified in Section 3.1 above for identifying conduct inconsistent with competition, the Market Participant may contact the ISO to provide an explanation of any legitimate basis for any such changes in the Market Participant's bids. If a Market Participant's explanation of the reasons for its bidding indicates to the satisfaction of the ISO, that the questioned conduct is consistent with competitive behavior, no further action will be taken. Upon request, the ISO shall also consult with a Market Participant with respect to the information and analysis used to determine reference levels under Section 3.1.2 for that Market Participant. \

## **4 MITIGATION MEASURES**

### **4.1 Purpose**

If conduct is detected that meets the criteria specified in Section 3, the appropriate mitigation measures described in this Section 4 shall be applied by the ISO. The conduct specified in Section 3.1.1 shall be remedied by the prospective application of a default bid measure as described in Section 4.2 for the specific hour that they violate the price and market impact thresholds.

### **4.2 Sanctions for Economic Withholding**

#### **4.2.1 Default Bid**

A default bid shall be designed to cause a Market Participant to bid as if it faced workable competition during a period when: (i) the Market Participant does not face workable competition and (ii)

has responded to such condition by engaging in the economic withholding of an Electric Facility. In designing and implementing default bids, the ISO shall seek to avoid causing an Electric Facility to bid below its marginal cost.

#### **4.2.2 Implementation**

- (a) If the criteria contained in Section 3 are met, the ISO may substitute a default bid for a bid submitted for an Electric Facility. The default bid shall establish a maximum value for one or more components of the submitted bid, equal to a reference level for that component determined as specified in Section 3.1.1.
- (b) The Mitigation Measures will be applied to 1) the Residual Unit Commitment Process based on the projected Real-time MCPs that are computed during this process; 2) all bids submitted to the Real Time Imbalance Energy Market during the pre-dispatch process prior to the Real Time Imbalance Energy Market based on the projected Real-time MCPs that are computed during this process; and 3) to the day-ahead and the hour-ahead energy markets when these markets are made operational.
- (c) The bids that are mitigated in the Residual Unit Commitment Process shall be retested for both conduct and impact thresholds in the real-time pre-dispatch process. If the pre-dispatch market impact threshold is not violated, the bids shall be included in the real-time supply stack at their original (unmitigated) prices.
- (d) An Electric Facility subject to a default bid shall be paid the MCP applicable to the output from the facility. Accordingly, a default bid shall not limit the price that a facility may receive unless the default bid determines the MCP applicable to that facility. With regard to imports into the ISO Control Area, importers will be paid the higher of the MCP or their default bid price. However, default bids by importers will not establish the MCP.
- (e) The ISO shall not use a default bid to determine revised MCPs for periods prior to the imposition of the default bid, except as may be specifically authorized by the Commission.

- (f) The Mitigation Measures shall not be applied for the hours when the day-ahead system load forecast exceeds 40,000 MW. However, the bids used during the hours when the day-ahead system load exceeds 40,000 MW, even if in economic merit order, shall be excluded from the computation of the Reference Levels.
- (g) The posting of the MCP may be delayed if necessary for the completion of automated mitigation procedures.
- (h) Bids not mitigated under these Mitigation Measures shall remain subject to mitigation by other procedures specified in the ISO Tariff as may be appropriate.

#### **4.3 Sanctions for Physical Withholding**

The ISO may report a Market Participant the ISO believes to have engaged in physical withholding, including providing the ISO false information regarding the derating or outage of an Electric Facility, to the Federal Energy Regulatory Commission in accordance with Section 2.3.3.9.5 of the ISO Tariff. In addition, a Market Participant that fails to operate a Generating Unit in conformance with ISO dispatch instructions shall be subject to the penalties set forth in Section 11.2.4.1.2 of the ISO Tariff.

#### **4.4 Duration of Mitigation Measures**

Bids will be mitigated only in the specific hour that they violate the price and market impact thresholds.

### **5 FERC-ORDERED MEASURES**

In addition to any mitigation measures specified above, the ISO shall administer, and apply when appropriate in accordance with their terms, such other mitigation measures as it may be directed to implement by order of the FERC.

### **6 DISPUTE RESOLUTION**

If a Market Participant has reasonable grounds to believe that it has been adversely affected because a Mitigation Measure has been improperly applied or withheld, it may seek a determination in accordance with the dispute resolution provisions of the ISO Tariff. In no event, however, shall the ISO be

liable to a Market Participant or any other person or entity for money damages or any other remedy or relief except and to the extent specified in the ISO Tariff.

**7 EFFECTIVE DATE**

These Mitigation Measures shall be effective as of the date they are approved by the FERC.



# **Attachment M**

## Damage Control Bid Cap

### 5.13.2.2 Real Time Market

\* \* \*

Submitted Energy Bids shall be subject to the Damage Control Bid Cap as set forth in Section 28.1 and to the Mitigation Measures set forth in Appendix A to the Market Monitoring and Information Protocol.

### **28. TEMPORARY RULES LIMITING DISQUALIFYING CERTAIN ENERGY AND ANCILLARY SERVICE BIDS**

#### **~~28.1 Application and Termination~~**

~~The temporary change disqualifying certain Energy and Ancillary Service bids set out in Section 28.2 shall continue in effect until November 15, 2000, unless its effectiveness is extended by order of the FERC.~~

#### **~~28.2 Disqualification of Certain Energy and Ancillary Service Bids~~**

~~The ISO may establish price levels for the Imbalance Energy market and/or for any Ancillary Service market above which any bid for a Settlement Period to which the price level applies will be rejected. The ISO shall establish such price levels in accordance with criteria adopted by the ISO Governing Board from time to time and shall publish such price levels on WEnet or the ISO Home Page in advance of the first Settlement Period for which the ceiling price levels apply.~~

#### **28.1 Damage Control Bid Cap**

**28.1.1 Notwithstanding any other provision of this ISO Tariff, the ISO shall reject any bid into the ISO's Energy and Ancillary Service capacity markets that exceed the levels specified in Section 28.1.2 and 28.1.4.**

**28.1.2 The maximum bid level shall be \$108/MWh, based on a proxy figure for natural**



gas cost of \$6.641/MMBtu, a \$6.00 adder for variable operations and maintenance costs and an incremental heat rate of 15,360 Btu/kwh. The maximum bid level shall be recalculated when the proxy figure for natural gas costs determined in accordance with the Commission's December 19, 2001 Order Temporarily Modifying the West Wide Mitigation Methodology in Docket No. EL01-68-000 by utilizing the current average of the mid-point for the monthly bid-week index prices reported for SoCal Gas (large packages), Malin and PG&E city-gate in differs from the proxy figure for natural gas costs used to calculate the maximum bid level by more than ten percent, though the maximum bid level shall not be less than \$108/MWh.

28.1.3 The ISO will determine the amount specified in Section 28.1 on a monthly basis and publish the amount on the ISO Home Page in advance of the month to which the maximum bid level applies.

28.1.4 Negative Bids

Negative bids into the ISO Markets shall be limited to -\$30/MWh (minus thirty dollars per MWh).

28.1.5 The limitation in this section 28.1 shall not apply if and when the 12 month trigger in section 28.2 has been exceeded and the mitigation in 28.2.3 is in effect.



# **Attachment N**

## APPENDIX A

### ISO Market Monitoring Plan

#### Market Mitigation Measures

#### 1 PURPOSE AND OBJECTIVES

##### 1.1 These ISO market power mitigation measures ("Mitigation Measures")

are intended to provide the means for the ISO to mitigate the market effects of any conduct that would substantially distort competitive outcomes in the ISO Real Time Market and Residual Unit Commitment Process while avoiding unnecessary interference with competitive price signals. These Mitigation Measures are intended to minimize interference with an open and competitive market, and thus to permit, to the maximum extent practicable, price levels to be determined by competitive forces under the prevailing market conditions. To that end, the Mitigation Measures authorize the mitigation only of specific conduct that exceeds well-defined thresholds specified below.

1.2 In addition, the ISO shall monitor the markets it administers for conduct that it determines constitutes an abuse of market power but does not trigger the thresholds specified below for the imposition of mitigation measures by the ISO. If the ISO identifies any such conduct, and in particular conduct exceeding the thresholds for presumptive market effects specified below, it shall make a filing under Section 205 of the Federal Power Act, 16 U.S.C. § 824d, with the Commission requesting authorization to apply appropriate mitigation measures. Any such filing shall identify the particular conduct the ISO believes warrants

mitigation, shall propose a specific mitigation measure for the conduct, and shall set forth the ISO's justification for imposing that mitigation measure.

## 1.2 CONDUCT WARRANTING MITIGATION

### 2.1 Definitions

The following definitions are applicable to this Appendix A:

"Economic Market Clearing Prices" are the market clearing prices for a particular resource at the location of that particular resource at the time the resource was either Scheduled or was Dispatched by the ISO. Economic Market Clearing Prices may originate from the Day-ahead Energy market, the Hour-ahead Energy market (when these markets are in place), or ISO Real-time Imbalance Energy market.

The Economic Market Clearing Price for the ISO Real Time Imbalance Energy Market shall be the BEEP Interval Ex Post Price, unless the resource cannot change output level within the hour (i.e., the resource is not amenable to intra-hour real-time dispatch instructions), or it is a System Resource. Economic Market Clearing Prices for the ISO Real Time Imbalance Energy Market for resources that cannot change output level within one BEEP Interval and System Resources shall be the simple average of the six BEEP Interval Ex Post Prices for each hour.

"Electric Facility" shall mean an electric resource, including a Generating Unit, System Unit, Participating Load or a System Resource.

## **2.2 Conduct Subject to Mitigation**

**Mitigation Measures may be applied: (i) to the bidding, scheduling, or operation of an "Electric Facility"; or (ii) as specified in section 2.4 below.**

## **2.3 Conditions for the Imposition of Mitigation Measures**

**2.3.1 In general, the ISO shall consider a Market Participant's conduct to be inconsistent with competitive conduct if the conduct would not be in the economic interest of the Market Participant in the absence of market power. The categories of conduct that are inconsistent with competitive conduct include, but may not be limited to, the three categories of conduct specified in Section 2.4 below.**

## **2.4 Categories of Conduct that May Warrant Mitigation**

**2.4.1 The following categories of conduct, whether by a single firm or by multiple firms acting in concert, may cause a material effect on prices or generally the outcome of an ISO Real Time Market or Residual Unit Commitment process if exercised from a position of market power. Accordingly, the ISO shall monitor the ISO Markets for the following categories of conduct, and shall impose appropriate Mitigation Measures if such conduct is detected and the other applicable conditions for the imposition of Mitigation Measures are met:**

- (1) Physical withholding of an Electric Facility, in whole or in part, that is, not offering to sell or schedule the output of or services provided by an Electric Facility capable of serving an ISO Market. Such withholding may include, but not be limited to: (i) falsely declaring**

that an Electric Facility has been forced out of service or otherwise become totally or partially unavailable, (ii) refusing to offer bids or schedules for an Electric Facility when it would be in the economic interest, absent market power, of the withholding entity to do so, (iii) declining real-time bids called upon by the ISO (unless the ISO is informed in accordance with established procedures that the relevant resource for which the bid is submitted has undergone a forced outage or derate), or (iv) operating a Generating Unit in real-time to produce an output level that is less than the ISO's Dispatch instruction.

(2) Economic withholding of an Electric Facility, that is, submitting bids for an Electric Facility that are unjustifiably high (relative to known operational characteristics and/or the known operating cost of the resource) so that: (i) the Electric Facility is not or will not be dispatched or scheduled, or (ii) the bids will set a market clearing price.

(3) Uneconomic production from an Electric Facility, that is, increasing the output of an Electric Facility to levels that would otherwise be uneconomic in order to cause, and obtain benefits from, a transmission constraint.

2.4.2 Mitigation Measures may also be imposed to mitigate the market effects of a rule, standard, procedure, design feature, or known software imperfection of an

ISO Market that allows a Market Participant to manipulate market prices or otherwise impair the efficient operation of that market, pending the revision of such rule, standard, procedure design feature, or software defect to preclude such manipulation of prices or impairment of efficiency.

2.4.3 Taking advantage of opportunities to sell at a higher price or buy at a lower price in a market other than an ISO Market shall not be deemed a form of withholding or otherwise inconsistent with competitive conduct.

2.4.4 The ISO shall monitor ISO Markets for other categories of conduct, whether by a single firm or by multiple firms acting in concert, that have material effects on prices in an ISO Market or other payments. The ISO shall: (i) seek to amend the foregoing list as may be appropriate to include any such conduct that would substantially distort or impair the competitiveness of any of the ISO Markets; and (ii) seek such other authorization to mitigate the effects of such conduct from the FERC as may be appropriate.

### 3 CRITERIA FOR IMPOSING MITIGATION MEASURES

#### 3.1 Identification of Conduct Inconsistent with Competition

Conduct that may potentially warrant the imposition of a mitigation measure includes the categories described in Section 2.4 above. The thresholds listed in section 3.1.1 below shall be used to identify substantial departures from competitive conduct indicative of an absence of workable competition.

##### 3.1.1 Conduct Thresholds for Identifying Economic Withholding

The following thresholds shall be employed by the ISO to identify economic withholding that may warrant the mitigation of the bid from a resource



and shall be determined with respect to a reference level determined as specified in Section 3.1.2:

Energy Bids: a 100 percent increase or \$50/MWh increase in the bid, whichever is lower.

3.1.1.1 Reference Levels

(a) For purposes of establishing reference levels, bid segments shall be defines as follows:

1. the capacity of each generation resource shall be divided into 10 equal Energy bid segments between its minimum (Pmin) and maximum (Pmax) operating point.
2. for Energy bids submitted over the intertie Scheduling Points (import bids), 10 bid segments shall be established for each Scheduling Coordinator at each Scheduling Point based on historical volumes over the preceding 12 months.

A reference level for each bid segment shall be calculated for peak and off-peak periods on the basis of the following methods, listed in the following order of preference subject to the existence of sufficient data, where sufficient data means at least one data point per time period (peak or off-peak) for the bid segment. Peak periods shall be the periods Monday through Saturday from Hour Ending 0700 through Hour Ending 2200, excluding holidays. Off-Peak periods are all other hours.

- 1. The lower of the mean or the median of a resource's accepted bids in competitive periods over the previous 90 days for peak and off-peak periods, adjusted for changes in fuel prices using the proxy figure for natural gas prices posted on the ISO Home Page;**
- 2. If the resource is a gas-fired unit that does not have significant energy limitations, the unit's default energy bid as set forth in Section 5.12 (based on the incremental heat rate submitted to the ISO, adjusted for gas prices, and the variable O&M cost on file with the ISO, or the default O&M cost of \$6/MWh).**
- 3. For non gas-fired units and gas-fired units that have significant energy limitations, a level determined in consultation with the Market Participant submitting the bid or bids at issue, provided such consultation has occurred prior to the occurrence of the conduct being examined by the ISO, and provided the Market Participant has provided sufficient data on a unit's energy limitations and operating costs (opportunity cost for energy limited resources) in accordance with specifications provided by the ISO.**

**4. The mean of the Economic Market Clearing Prices for the units' relevant location (zone or node commensurate with the pricing granularity in effect) during the lowest-priced 25 percent of the hours that the unit was dispatched or scheduled over the previous 90 days for peak and off-peak periods, adjusted for changes in fuel prices; or**

**5. If sufficient data do not exist to calculate a reference level on the basis of the first, second, or fourth methods and the third method is not applicable or an attempt to determine a reference level in consultation with a Market Participant has not been successful, the ISO shall determine a reference level on the basis of:**

- i. the ISO's estimated costs of an Electric Facility, taking into account available operating costs data, opportunity cost, and appropriate input from the Market Participant, and the best information available to the ISO; or**
- ii. an appropriate average of competitive bids of one or more similar Electric Facilities.**

**(b) The reference levels (\$/MWh bid price) for the different bid segments of each resource (or import bid curve of a Scheduling Coordinator at**

a Scheduling Point) shall be made monotonically non-decreasing by the ISO by proceeding from the lowest MW bid segment moving through each higher MW bid segment. The reference level of each succeeding bid segment shall be the higher of the reference level of the preceding bid segment or the reference level determined according to paragraph (b) above.

### **3.2 Material Price Effects**

#### **3.2.1 Market Impact Thresholds**

In order to avoid unnecessary intervention in the ISO Market, Mitigation Measures for economic withholding shall not be imposed unless conduct identified as specified above causes or contributes to a material change in one or more of the ISO market-clearing prices (MCPs). Initially, the thresholds to be used by the ISO to determine a material price effect shall be an increase of 100 percent or \$50 per MWh, whichever is lower, in the MCP at any location (zone or node) commensurate with the relevant pricing structure in effect in accordance with the ISO Tariff.

#### **3.2.2 Price Impact Analysis**

The ISO shall determine the effect on prices of questioned conduct through automated computer modeling and analytical methods. An Automatic Mitigation Procedure (AMP) shall identify bids that have exceeded the conduct thresholds and shall compute the change in MCPs as a result of simultaneously setting all such bids to their Reference Levels. If a change in the MCP exceeds the Impact

threshold stated in Section 3.2.1, those bids would be kept mitigated at their default bid levels as specified in Section 4.2.2 below.

### 3.2.3 Section 205 Filings

In addition, the ISO shall make a filing under Section 205 of the Federal Power Act with the Commission seeking authorization to apply an appropriate mitigation measure to conduct that departs significantly from the conduct that would be expected under competitive market conditions but does not rise to the thresholds specified in section 3.1.1 above, unless the ISO determines, from information provided by the Market Participant or Parties that would be subject to mitigation or other information available to the ISO that the conduct is attributable to legitimate competitive market forces or incentives. The following are examples of conduct that are deemed to depart significantly from the conduct that would be expected under competitive market conditions:

- (1) bids that vary with unit output in a way that is unrelated to the known performance characteristics of the unit, or
- (2) bids that vary over time in a manner that appears unrelated to the change in the unit's performance or to changes in the supply environment that would induce additional risk or other adverse shifts in the cost basis.

The conducts listed above are intended to be examples rather than a comprehensive list.

### 3.3 Consultation with a Market Participant

If a Market Participant anticipates submitting bids in an ISO market administered by the ISO that will exceed the thresholds specified in Section 3.1 above for identifying conduct inconsistent with competition, the Market Participant may contact the ISO to provide an explanation of any legitimate basis for any such changes in the Market Participant's bids. If a Market Participant's explanation of the reasons for its bidding indicates to the satisfaction of the ISO, that the questioned conduct is consistent with competitive behavior, no further action will be taken. Upon request, the ISO shall also consult with a Market Participant with respect to the information and analysis used to determine reference levels under Section 3.1.2 for that Market Participant. \

#### 4 MITIGATION MEASURES

##### 4.1 Purpose

If conduct is detected that meets the criteria specified in Section 3, the appropriate mitigation measures described in this Section 4 shall be applied by the ISO. The conduct specified in Section 3.1.1 shall be remedied by the prospective application of a default bid measure as described in Section 4.2 for the specific hour that they violate the price and market impact thresholds.

##### 4.2 Sanctions for Economic Withholding

###### 4.2.1 Default Bid

A default bid shall be designed to cause a Market Participant to bid as if it faced workable competition during a period when: (i) the Market Participant does not face workable competition and (ii) has responded to such condition by engaging in the economic withholding of an Electric Facility. In designing and

implementing default bids, the ISO shall seek to avoid causing an Electric Facility to bid below its marginal cost.

#### 4.2.2 Implementation

- (a) If the criteria contained in Section 3 are met, the ISO may substitute a default bid for a bid submitted for an Electric Facility. The default bid shall establish a maximum value for one or more components of the submitted bid, equal to a reference level for that component determined as specified in Section 3.1.1.
- (b) The Mitigation Measures will be applied to 1) the Residual Unit Commitment Process based on the projected Real-time MCPs that are computed during this process; 2) all bids submitted to the Real Time Imbalance Energy Market during the pre-dispatch process prior to the Real Time Imbalance Energy Market based on the projected Real-time MCPs that are computed during this process; and 3) to the day-ahead and the hour-ahead energy markets when these markets are made operational.
- (c) The bids that are mitigated in the Residual Unit Commitment Process shall be retested for both conduct and impact thresholds in the real-time pre-dispatch process. If the pre-dispatch market impact threshold is not violated, the bids shall be included in the real-time supply stack at their original (unmitigated) prices.
- (d) An Electric Facility subject to a default bid shall be paid the MCP applicable to the output from the facility. Accordingly, a default bid

shall not limit the price that a facility may receive unless the default bid determines the MCP applicable to that facility. With regard to imports into the ISO Control Area, importers will be paid the higher of the MCP or their default bid price. However, default bids by importers will not establish the MCP.

- (e) The ISO shall not use a default bid to determine revised MCPs for periods prior to the imposition of the default bid, except as may be specifically authorized by the Commission.
- (f) The Mitigation Measures shall not be applied for the hours when the day-ahead system load forecast exceeds 40,000 MW. However, the bids used during the hours when the day-ahead system load exceeds 40,000 MW, even if in economic merit order, shall be excluded from the computation of the Reference Levels.
- (g) The posting of the MCP may be delayed if necessary for the completion of automated mitigation procedures.
- (h) Bids not mitigated under these Mitigation Measures shall remain subject to mitigation by other procedures specified in the ISO Tariff as may be appropriate.

#### 4.3 Sanctions for Physical Withholding

The ISO may report a Market Participant the ISO believes to have engaged in physical withholding, including providing the ISO false information regarding the derating or outage of an Electric Facility, to the Federal Energy Regulatory Commission in accordance with Section 2.3.3.9.5 of the ISO Tariff. In addition, a



**Market Participant that fails to operate a Generating Unit in conformance with ISO dispatch instructions shall be subject to the penalties set forth in Section 11.2.4.1.2 of the ISO Tariff.**

**4.4 Duration of Mitigation Measures**

**Bids will be mitigated only in the specific hour that they violate the price and market impact thresholds.**

**5 FERC-ORDERED MEASURES**

**In addition to any mitigation measures specified above, the ISO shall administer, and apply when appropriate in accordance with their terms, such other mitigation measures as it may be directed to implement by order of the FERC.**

**6 DISPUTE RESOLUTION**

**If a Market Participant has reasonable grounds to believe that it has been adversely affected because a Mitigation Measure has been improperly applied or withheld, it may seek a determination in accordance with the dispute resolution provisions of the ISO Tariff. In no event, however, shall the ISO be liable to a Market Participant or any other person or entity for money damages or any other remedy or relief except and to the extent specified in the ISO Tariff.**

**7 EFFECTIVE DATE**

**These Mitigation Measures shall be effective as of the date they are approved by the FERC.**



# **Attachment O**

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

<b>San Diego Gas &amp; Electric Company,</b>	)	
<b>Complainant,</b>	)	
	)	
<b>v.</b>	)	<b>Docket No. EL00-95-045</b>
	)	
<b>Sellers of Energy and Ancillary Services</b>	)	
<b>Into Markets Operated by the California</b>	)	
<b>Independent System Operator and the</b>	)	
<b>California Power Exchange,</b>	)	
<b>Respondents.</b>	)	
	)	
<b>Investigation of Practices of the California</b>	)	
<b>Independent System Operator and the</b>	)	<b>Docket No. EL00-98-042</b>
<b>California Power Exchange</b>	)	

**AFFIDAVIT OF MARK ROTHLEDER CONCERNING THE IMPORTANCE OF  
ELIMINATING THE “TARGET PRICE” METHODOLOGY IN THE REAL TIME  
IMBALANCE MARKET OF THE CALIFORNIA INDEPENDENT SYSTEM  
OPERATOR CORPORATION**

1. My name is Mark Rothleder. I am currently employed by the California Independent System Operator (“ISO”) as the Manager of Market Integration. My business address is 151 Blue Ravine Road, Folsom, California 95630.
2. Since joining the ISO over five years ago, I have worked extensively on implementing and integrating the approved market rules for California’s competitive Energy and Ancillary Services markets, and the rules for Congestion Management, into the operations of the ISO Control Area. Most recently, I have played a lead role in the design and implementation of market rules, operating procedures and software modifications related

to the Federal Energy Regulatory Commission's (the "Commission's") Market Mitigation Orders issued on April 26, 2001, 95 FERC ¶ 61,115, (2001) ("April 26 Order") and June 19, 2001, 95 FERC ¶ 61,418 (2001) ("June 19 Order").

3. I hold a B.S. degree in Electrical Engineering from the California State University, Sacramento. I have taken post-graduate coursework in Power System Engineering from Santa Clara University and in Information Systems from the University of Phoenix. I am a registered Professional Electrical Engineer in the state of California. I have co-authored articles on aspects of the California electricity market design in professional journals and have made numerous presentations to industry forums on the California market design. Prior to joining the ISO in 1997, I worked for nine years in the Electric Transmission Department of the Pacific Gas & Electric Company, where my responsibilities included Operations Engineering, Transmission Planning and Substation Design.
4. The purpose of this declaration is to describe the problems encountered with the ISO's Target Price and the methodology and potential benefits that can be derived from eliminating the ISO's Target Price procedure in the Real Time Imbalance Energy Market.
5. Since the inception of the Real Time Imbalance Energy Market, quantities of bids with overlapping prices (the "Price Overlap") have caused inefficiencies and perverse price signals. The Price Overlap is an unpredictable quantity of bids from Scheduling Coordinators who are

willing to buy real-time Energy (i.e., reduce generator output) at prices higher than the prices at which other Scheduling Coordinators are willing to sell real-time energy (i.e., increase generator output). In a market with real-time trading opportunities, overlapping bids would become mutually beneficial trades between buyers and sellers and the Price Overlap would be eliminated by these trades. In the design of the ISO's Real Time Imbalance Market, however, there is no opportunity for Scheduling Coordinators to execute such trades, nor is the ISO permitted to execute trades on behalf of Scheduling Coordinators because of a market rule that limits the ISO to making real-time dispatches only to meet the imbalance energy needs of the system, as further described below. As a result, trades that would benefit both buyer and seller go unexecuted.

6. A Price Overlap is always possible even if it does not exist among the bids of any given Scheduling Coordinator, since the decremental and incremental Imbalance Energy bids offered into the ISO Imbalance Energy Market are submitted by many different Scheduling Coordinators. As a result, one would expect a natural amount of overlap between Scheduling Coordinators. Individual Scheduling Coordinators submitting overlapping bids within their own portfolios, however, is an indication of an attempt to manipulate the market that can be remedied only by clearing (i.e. executing trades involving the overlapping bids) the Price Overlap.
7. The Price Overlap is an indication of profitable trade opportunity among Market Participants since Imbalance Energy can be exchanged

(purchased from incremental bids and sold to decremental bids) at a mutually beneficial price. This price has been traditionally called the “Target Price” and lies somewhere within the Price Overlap. Prior to starting operation on April 1, 1998, the ISO anticipated the need to resolve the overlapping bids. As a result, the ISO established the “Target Price” methodology for resolving the bid overlap in ISO Scheduling Protocol Section 11.2. Given the ISO’s market structure, the Price Overlap must be eliminated to produce a monotonically non-decreasing aggregate Imbalance Energy bid curve. Such a bid curve is essential to ensure compliance with existing reliability criteria and to provide price signals that are consistent with the ISO’s imbalance energy requirements. Without eliminating the Price Overlap, under the ISO’s current one-sided Imbalance Energy auction mechanism, the ten-minute interval price may abruptly change from low to high as the Imbalance Energy requirement changes from positive to negative (i.e., from over-supply to under-supply) across ten-minute intervals, though the price may not change in proportion to changes in the magnitude of the Imbalance Energy requirement. Such changes in price without corresponding changes to the imbalance energy requirement yield flawed economic signals that fail to provide proper incentives for real-time response. Since real-time generator performance depends on real-time price signals, and since the ISO’s compliance with reliability criteria depends on real-time generator performance, meaningful and consistent imbalance energy price signals are necessary for the ISO

to comply effectively and efficiently with reliability criteria. For example, without eliminating the Price Overlap, for an Imbalance Energy requirement alternating between 10 MW and –10 MW, the price may alternate between \$30/MWh and \$100/MWh, with the high price at intervals of Energy surplus and the low price at intervals of Energy shortfall – the opposite of what one would expect. Such confusing price signals create perverse incentives in the ISO markets for generating resources to increase production at a time when the ISO is seeking to reduce generation output.

8. To try to remove this price confusion and the resulting operational instability, the current ISO Real Time Market design eliminates the Price Overlap by creating an aggregate Imbalance Energy merit order bid stack that is a monotonic non-decreasing bid curve by using a Target Price that replaces all bid prices that lie within the Price Overlap. The original Target Price established under the authority established in ISO Scheduling Protocol 11.2 prior to ISO beginning operations was effectively the Market Clearing Price (“MCP”) that would have resulted if the overlapping incremental and decremental bids were matched and called in merit order. Such a Target Price is calculated as the intersection between the incremental supply curve and the mirror image of the decremental supply curve over the price axis. The prices for all incremental bids lower than the Target Price are set equal (i.e. increased) to the Target Price, and the prices for all decremental bids higher than the Target Price are set equal



(i.e. decreased) to the Target Price, with the result being a monotonic non-decreasing aggregate supply curve.

While the Target Price intends to address the problems of the Price Overlap, it is not a perfect solution. Section 2.5.22.2 (c) of the ISO tariff directs that “The ISO shall dispatch Generating Units, System Units, Loads and System Resources only to meet its Imbalance Energy requirements. The ISO shall not dispatch such resources in real time for economic trades either between Scheduling Coordinators or within a Scheduling Coordinator portfolio.” As a result, the Target Price remains a problem because the ISO is currently not permitted to take the economically rational action of “clearing the Price Overlap,” by accepting all overlapping bids and requiring the bidders to actually deliver the Energy in their submitted bid, therefore creating transactions to buy and sell Energy at the resulting Target Price. The ISO’s inability to clear the Price Overlap allows Scheduling Coordinators to manipulate the Target Price when the ISO needs to procure Imbalance Energy by submitting unrealistically high-priced decremental bid offers to buy Energy, thereby artificially raising the Target Price, while at the same time obtaining Dispatch priority by submitting unrealistically low incremental bid offers to sell Energy, expecting that the ISO will not Dispatch their decremental bids but must pay their Dispatched incremental bids the Target Price elevated by their high-priced decremental bids. This behavior was possible because Scheduling Coordinators had a high level of certainty,

based on the ISO's recent real-time dispatch behavior and the current Day-Ahead market conditions, that the ISO would be resource-deficient in real-time and would therefore be incrementing resources to meet the Imbalance Energy requirements. The artificial high prices also caused increased uninstructed deviation since those Generators that felt the Target Price was attractive would "chase" (i.e., increase generation without instruction from the ISO) the high price.

9. In April 2000, the ISO tried to eliminate this gaming opportunity by changing its method for calculating the Target Price. This change set the Target Price to be the greater of \$0/MWh or the price of the lowest priced incremental bid. However, as market conditions changed during the summer of 2001 the Target Price again became problematic. By submitting a \$0/MWh incremental bid, even for a very small MW quantity, Scheduling Coordinators were able to set the Target Price at \$0/MWh in periods in which the ISO needed no incremental Imbalance Energy but would instead be decrementing resources, thus resetting all decremental bid prices to zero. This distorted the Real Time Imbalance Energy price and effectively enabled Market Participants to buy Energy from the ISO's Imbalance Energy market for free. The artificial \$0/MWh Imbalance Energy price encouraged suppliers to reduce their output or under-deliver their scheduled energy, forcing the ISO to procure energy not because of an inherent load/generation imbalance but because generators were "chasing" prices.

10. On September 1, 2000, the ISO changed its Real Time Imbalance Energy Market to include ten-minute settlements to try to improve generator response. To implement ten-minute settlements, the ISO created two real-time prices: an incremental and a decremental price (“INC price” and “DEC price,” respectively). If the ISO Dispatches bids only in one direction (i.e. either all incremental or all decremental bids), the INC price and the DEC price are the same. However, if in a ten-minute interval the Imbalance Energy requirements force the ISO to change from an incremental mode to a decremental mode, the ISO could have different INC and DEC prices. To the extent the INC and DEC prices are different, Uninstructed Energy is settled based on the unfavorable price. For example, positive Uninstructed Energy (i.e. Energy supplied without an ISO instruction) is paid the DEC price while positive Instructed Energy is paid the INC price. While the two-price system provided some incentive to generate according to schedule and to follow ISO Dispatch instructions, many Market Participants complained about the complexity of the two-price system. Furthermore, the two-price settlement, in conjunction with the modified Target Price, reduced incentives to bid into the Regulation Up market since Regulation Energy was paid at the uninstructed Imbalance Energy price. Therefore when the decremental price was set to \$0/MWh as a result of suppliers gaming the Target Price as described above, regulation units were not being compensated for their energy.

11. On October 29, 2001, the ISO reverted to the original single Target Price methodology, but limited its application to “feasible” bids and available proxy bids only. An intertie bid is determined to be feasible if the intertie bid was actually pre-dispatched prior to the operating hour. A generator bid is determined to be feasible based on the quantity of the bid that can be dispatched in ten-minutes based on its ramp rate. A load bid is determined to be feasible if the bid is associated with a Participating Load Agreement and, as a result, is visible to the ISO. The ISO reverted to the single Target Price to reduce the opportunities for gaming the Target Price. Now, after trying to solve the problem of gaming the Target Price with both one and two Target Prices, the ISO has determined that the best solution, rather than trying to craft a better Target Price formula, is to go to the root of the problem and eliminate the design constraint that prevents the ISO from dispatching overlapping bids. Therefore, as detailed below, the ISO proposes to eliminate the Target Price.

While implementing a single price system and eliminating the Target Price will produce significant benefits, including increased price transparency for Market Participants, the ISO notes that its operational history shows that such a single Imbalance Energy price increases the frequency and quantity of uninstructed deviations. Table 1 shows that uninstructed deviations have increased in both the hourly and ten-minute Settlement regimes at the ISO. As a result, also as detailed below, the ISO also proposes Tariff modifications to provide for narrowly-tailored

explicit penalties to be levied against Scheduling Coordinators for uninstructed deviations that are beyond a tolerance band for generating unit performance.

**Table 1  
Average Monthly Positive and Negative  
Uninstructed Deviations**

<b>Period</b>	<b>Average Net Positive Deviation from Generation <sup>1</sup></b>	<b>Average Net Negative Deviation from Generation</b>
<b>Jun – Aug 2000</b>	<b>959.9 MW</b>	<b>557.0 MW</b>
June	895.0	632.8
July	882.8	564.4
August	1099.8	476.2
<b>Sep – Nov 2000</b>	<b>479.1</b>	<b>620.1</b>
September	569.3	591.1
October	362.5	609.8
November	509.6	659.6
<b>Dec 2000 – Feb 2001</b>	<b>659.9</b>	<b>829.7</b>
December	721.7	659.7
January	531.6	866.8
February	729.0	978.3
<b>Mar – May 2001</b>	<b>297.1</b>	<b>808.9</b>
March	298.4	720.2
April	287.8	859.7
May	304.7	848.7
<b>Jun – Aug 2001</b>	<b>382.6</b>	<b>981.2</b>
June	549.9	1087.2
July	322.0	974.5
August	278.1	882.1

<sup>1</sup> Net deviations are shown because Scheduling Coordinators are allowed to offset positive deviations from some of their resources with negative deviations from other resources, in real time. The net positive deviations are averaged for intervals in which individual Scheduling Coordinators have positive values, and net negative deviations are averaged for intervals in which individual Scheduling Coordinators have negative values. Because the output of resources that are providing Regulation will vary within a time period, the results reported here exclude resources for which Regulation bids have been accepted during the specific interval. Although generators that are providing Regulation are included in the overall calculation of uninstructed deviations for settlements purposes, Automatic Generation Control (“AGC”) equipment will attempt to keep a generator’s output within its regulating range, and will vary its output within the regulating range in response to system conditions. Thus, only deviations outside the regulating range would be truly uninstructed from an operational perspective, without a review of plant-specific operations. Such deviations have initially decreased since the implementation of ten-minute markets, but are small compared to the uninstructed deviations of generators that are not providing Regulation due to the effectiveness of AGC equipment, as shown in the following table (showing the sum of plant-specific uninstructed deviations rather than netting deviations across each Scheduling Coordinator’s portfolio):

<b>Month (Year 2000)</b>	<b>Average Positive Deviation Outside Regulating Range</b>	<b>Average Negative Deviations Outside Regulating Range</b>
June	35.8 MW	44.7 MW
July	30.8	36.3
August	41.5	40.4
September	31.4	27.0
October	12.0	20.8
November	5.8	18.4

12. To eliminate the Price Overlap, the ISO proposes to issue Dispatch instructions to all overlapping bids, thus requiring bidders to actually buy Energy (*i.e.*, reduce generation) or sell Energy (*i.e.*, increase generation) at the applicable ten-minute price.
13. Thus, by clearing the Price Overlap for each ten-minute interval, the separate INC and DEC prices converge to a single MCP. As a result, the proposed changes will simplify ISO real-time pricing by setting a single interval MCP.
14. In developing the instant proposed modifications to the ISO Tariff, which are designed to deter unintended consequences of increased uninstructed deviations, the ISO seeks to balance operational requirements to maintain system reliability with maximum operational flexibility for suppliers and accommodation of specific operating requirements of certain Market Participants. The proposed modifications include penalties for certain uninstructed deviations which the ISO carefully has designed to serve as a targeted and specific incentive mechanism for Market Participants to minimize uninstructed deviations and to be a fair penalty for those Market Participants that persist in deviating from submitted schedules and Dispatch instructions beyond a reasonable tolerance band.
15. The ISO believes that some penalty beyond the replacement cost of energy must be imposed on a unit for failing to deliver according to a Dispatch instruction. A supplier with more than one generating unit could otherwise profit by increasing the MCP for all of its generating units by

failing to deliver from one unit. Since the ISO deems Dispatch instructions to be delivered, the unit that failed to deliver both is paid the MCP for the amount of Energy in its Dispatch instruction and charged the MCP for the amount of Energy it fails to deliver. Without a penalty, if the unit is dispatched but delivers nothing, the payments and charges completely offset each other, leaving the generator financially indifferent to whether its unit responds to the Dispatch instruction or not. Because the ISO still requires the Energy, the ISO then is forced to call on the next bid in merit order in the BEEP stack, thereby raising the MCP. To provide an incentive for Scheduling Coordinators to comply with Dispatch instructions and specifically to discourage this market-manipulating behavior, the ISO proposes imposing a modest penalty on generators who fail to deliver their scheduled energy plus any Energy Dispatched by the ISO.

16. The proposed modifications are specifically designed to provide to Market Participants flexibility in complying with their Dispatch Operating Point (“DOP”). The ISO proposes to continue to issue unit-specific Dispatch instructions and to continue to settle on a unit-specific basis. The ISO proposes, however, to allow Scheduling Coordinators to aggregate generating units interconnected at a single ISO grid bus point for purposes of determination of the Uninstructed Deviation Penalty, thus effectively gaining the ability to net deviations from units located at a single point. The ISO also will allow for the net determination of penalties for other aggregations of generating units, as approved by the ISO on a case-



specific basis. Moreover, the ISO's proposed modifications will allow suppliers to deviate from their DOP by a reasonable amount without incurring any penalties. The ISO believes that this tolerance band is sufficient to take into account unintentional deviations that occur as a result of normal unit operations while being sufficiently stringent enough to provide incentives to Scheduling Coordinators to maintain expected unit output. In addition to the flexibility provided to generating units, the instant proposed modifications will allow Metered Subsystems and other Market Participants serving their own Load the ability to follow changes in Demand with their own generation, and will apply Uninstructed Deviation penalties only to the net Energy deliveries to or from the ISO. Finally, the ISO proposes to exempt entities with limited control over their output, such as intermittent resources and units providing regulation, from the uninstructed deviation penalty provisions.

17. The proposed penalties for positive uninstructed deviations will be the quantity of Uninstructed Imbalance Energy in excess of the tolerance band multiplied by a price that initially will be equal to 100% of the corresponding BEEP Interval Ex Post price. Thus the net effect of the uninstructed deviation penalty and the settlement for positive uninstructed deviations beyond the tolerance band will be that the supplier will not be paid for any such Energy. The uninstructed deviation penalty for negative uninstructed deviations will equal the amount of Uninstructed Imbalance Energy in excess of the tolerance band multiplied by a price that will be

set initially equal to 50% of the corresponding BEEP Interval Ex Post price. Thus the net effect of the uninstructed deviation penalties and uninstructed Imbalance Energy settlement will be that this energy will be charged at 150% of the corresponding BEEP Interval Ex Post price.

In summary, the proposed changes to the Target Price and Imbalance Energy price are necessary to eliminate the disproportional changes to the ISO Imbalance Energy Price and the gaming opportunities currently present. The proposed uninstructed deviation penalties are necessary to improve generator performance and to eliminate the incentive for suppliers to influence the market clearing price.

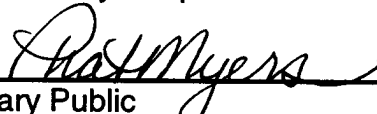
I declare under penalty of perjury that the foregoing is true and correct.

Executed on 29 April 2002.

  
Mark Rothleder

County of Sacramento  
State of California

Subscribed and sworn before me on this  
29 day of April 2002

  
Notary Public

My Commission expires on July 20, 2004





# **Attachment P**

**PUBLIC VERSION - CONFIDENTIAL MATERIALS REDACTED**

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

**Affidavit of Eric W. Hildebrandt**

My name is Eric Hildebrandt and I am the Manager of Market Investigations for the California Independent System Operator Corporation (ISO). My business address is 151 Blue Ravine Road, Folsom, CA 95360. Since joining the ISO in September 1998, my responsibilities have included monitoring and investigating anomalous market performance and behavior relating to intra-zonal congestion and locational market power. I have worked extensively on locational market power issues, including the investigation of specific Out-of-Sequence (OOS) dispatches made for inter-zonal congestion and other local reliability requirements, and the mitigation of locational market power through Reliability Must-Run (RMR) contracts.

The purpose of this affidavit is to provide specific examples of how locational market power can and has been exercised in the ISO's system under the ISO's current tariff and market design. Section I provides a short introductory discussion of locational market power and intra-zonal congestion management in the ISO system. Section II summarizes several cases illustrating the exercise of locational market power in the ISO system in instances where the ISO has needed to call upon specific generation units for additional incremental energy or on-line capacity in order to ensure local reliability and/or mitigate intra-zonal congestion. This situation has sometimes been referred to as the "Inc Game". Section III provides a series of actual examples illustrating the exercise of locational market power in instances where the ISO has needed to call upon specific

## **PUBLIC VERSION - CONFIDENTIAL MATERIALS REDACTED**

generation units to reduce generation in order to ensure local reliability and/or mitigate intra-zonal congestion. This has been referred to as the “Dec Game.”

### **I. EXERCISE OF LOCATIONAL MARKET POWER THROUGH THE INC GAME**

Locational market power problems can arise on any electric power network due to constraints in the transmission system and concentration of ownership of generating units within “load pockets” with limited transmission capacity to the main electrical grid. When local system conditions are such that any individual generating unit, or generation from a group of units owned by just one or two suppliers, are needed to ensure local system reliability, local market power can arise, i.e., owners of specific resources needed to ensure local reliability are able to demand unreasonable prices for additional capacity and/or generation needed by the ISO to ensure local reliability. Locational market power can also arise within “generation pockets” where the amount of energy scheduled by one or more generators may exceed the transmission capacity out of a “generation pocket”, thereby requiring the ISO to call upon these same generators to reduce their generation to mitigate the intra-zonal congestion created by this “generation pocket”.

California’s original (and current) market design is based primarily on a contractual approach to mitigating the local market power of units located at known strategic locations on the transmission grid, based on Reliability Must-Run (RMR) agreements. Through an annual planning process, the ISO designates specific generating units as having “RMR status” based on the potential need for these units to be on-line and/or generate at sufficient levels to provide voltage support, adequate local generation

## PUBLIC VERSION - CONFIDENTIAL MATERIALS REDACTED

in the event of system contingencies, and meet other system requirements related to local reliability. Units receiving RMR designation are subject to a pro forma RMR contract agreement, which is a clear mechanism by which the ISO can dispatch specific units on a day-ahead basis or in real time to ensure that sufficient energy and on-line generation within each RMR area are available to meet local reliability requirements. RMR contracts also provide a mechanism for compensating unit owners for the costs of operating when units are needed for local reliability, but may not be economical to operate based on overall energy and ancillary service market prices.<sup>1</sup> RMR contracts provide a means of mitigating one form of local market power (the “Inc Game”) by ensuring that the ISO has the ability to call upon RMR units to provide energy at a pre-agreed, cost-based rate if the level of RMR generation needed to meet local reliability requirements is not scheduled through a market transaction. In the absence of RMR contracts, generation owners could, under certain load conditions, bid capacity at a very high price in the real-time energy market and force the ISO to meet local reliability requirements by calling for generation *out-of-sequence* at these uncompetitively high bid prices.

While RMR contracts mitigate the ability of units to exercise the “Inc Game”, temporary transmission outages, unit outages (including outages of RMR units), or other extraordinary system conditions can create a need for the ISO to call virtually any unit on the grid, not just RMR units, to ensure local system reliability. In addition, since planning criteria upon which RMR designations are based on the need to ensure sufficient incremental energy (or on-line capacity) to ensure local are reliability with

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<sup>1</sup> In addition variable cost payments designed to “make owners whole” for any incremental operating costs incurred when called upon to meet RMR generation requirements, RMR contracts provide a fixed payments to RMR unit owners that have been negotiated (and in some cases litigated) with the unit owners by the ISO and the owner of the portion of the transmission system in which the RMR unit is located.

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“load pockets”, generating units within “generation pockets” are typically not under RMR contracts and are therefore able to exercise locational market power through the “Dec Game” under certain system conditions.

The concern that generators have opportunities to profit unduly from Intra-Zonal Congestion and other locational reliability constraints is not simply theoretical; the ISO has observed this behavior on a numerous occasions. The following sections provide examples of specific cases in which the “Inc Game” and “Dec Game” have been successfully employed by suppliers so that they could be called out-of-sequence by the ISO in real time, and be paid bid prices for incremental energy significantly in excess of the real time market clearing price and their marginal generation costs (or *pay* bid prices for decremental generation significantly *lower* than the real time market clearing price and their marginal costs for decremental energy).

## **II. EXERCISE OF LOCATIONAL MARKET POWER THROUGH THE “INC GAME**

The single most egregious example of the “Inc Game”, involving the Huntington Beach and Alamitos plants owned/operated by AES/Williams is well documented before the Commission. As summarized in a Show Cause Order <sup>2</sup> issued by the Commission:

The California Independent System Operator (ISO) referred to the Commission circumstances relating to the operation by Williams Energy Market & Trading Company (Williams) and AES Southland, Inc. ... of certain reliability must-run (RMR) generation units located in Orange County, California during April and May 2000 .....

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<sup>2</sup> 94 FERC ¶ 61,248, Docket No. IN01-3-000, March 14, 2001.



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During the April to May 2000 period, the ISO sought to dispatch both Alamitos 4 and Huntington Beach 2 as RMR units to provide voltage support. From April 25 through May 5, 2000, the ISO sought to dispatch Alamitos 4, but it was unavailable. Consequently, the ISO was forced to dispatch a non-RMR unit, Alamitos 3, to provide replacement service for Alamitos 4. Similarly, beginning May 6, 2000, the ISO sought to dispatch Huntington Beach 2 but it was unavailable. Consequently, the ISO was forced to dispatch the only non-RMR unit available, Alamitos 5, to replace Huntington Beach 2....

If the RMR units had not experienced outages from April 25 through May 11, 2000, Williams would have received either (1) the market revenues only from the respective units, which would have resulted in no payments for RMR output from the ISO to Williams, or (2) Williams' variable cost for operating the RMR units less the market revenues from the respective units' output. Accordingly, Williams had a financial incentive to prolong any outages of Alamitos 4 and Huntington Beach 2 in April and May 2000.

Williams received more revenues as a result of the respective outages at Alamitos 4 and Huntington Beach 2 because it received the bid price for service provided by the replacement, non-RMR units. The bid price for the non-RMR units was at or near the ISO's then-effective bid cap of \$750 per Mwh. Williams received payments from the ISO of more than \$11.3 million. While Williams' bid price was at or near \$750 per MWh, the estimated average variable operating cost of the non-RMR units during the period in question was approximately \$63 per megawatt hour. [Emphasis added]

While this incident is notable due to the magnitude of the excess charges involved and the detailed investigation that ensued, the basic situation involved in this case is no way an isolated incident. Prior to this incident, a series of similar incidents were brought to the Commission's attention in the ISO's Answer to Motions to Intervene in its filing of proposed Tariff Amendment No. 23.<sup>3</sup>

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<sup>3</sup> See *Answer Of California Independent System Operator Corporation To Motions To Intervene, Comments, Protests, And Request For Hearing*, Docket No. ER00-555-000, pp.14-15, December 20, 1999.

**III. EXERCISE OF LOCATIONAL MARKET POWER THROUGH THE “DEC GAME “**

Examples of the “Dec Game” were previously documented before the Commission in the ISO’s Answer to Motions to Intervene in the Tariff Amendment No. 23 proceeding.<sup>4</sup> Another particularly egregious example of the “Dec Game” has been documented in recent weekly Market Monitoring Report submitted to the Commission pursuant to the April 26 Order.<sup>5</sup> This section also provides additional recent examples illustrating the chronic and continued nature of this problem.

Five cases are presented where intra-zonal congestion created locational market power, and the ISO was forced to procure decremental energy (i.e. to “buy back” energy from unit by having them operate at level lower than the Hour Ahead Schedule submitted to the ISO by the unit’s Scheduling Coordinator) at a price significantly lower than both the unit’s decremental generation costs and the market clearing price for decremental energy in the ISO’s real time market. All of the examples also illustrate cases in which the bidding and/or scheduling behavior of generators changed as they became aware of such conditions and started being dispatched Out-Of-Sequence by the ISO, suggesting that the generators owners sought to fully exploit these temporary (but reoccurring) opportunities to exercise locational market power.

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<sup>4</sup> See *Answer Of California Independent System Operator Corporation To Motions To Intervene, Comments, Protests, And Request For Hearing*, Docket No. ER00-555-000, p. 15 December 20, 1999.

<sup>5</sup> See *Market Monitoring Report*, December 20 – December 26, Attachment A.

**PUBLIC VERSION - CONFIDENTIAL MATERIALS REDACTED**

For each example, a table and several charts is attached to this affidavit which depict the following information on an hourly basis for a 48 hour period that encompasses the period before and during the OOS calls issued by the ISO:

- (1) Each unit's final Hour Ahead Energy Schedules, along with the amount of capacity bid and/or called by the ISO in real time either through the Real Time Market or out-of-sequence.
- (2) The range of bid prices for decremental energy (shown in terms the minimum, maximum and average bid price for each hour).
- (3) The total difference in payments due as a result of having decremented bids called out-of-sequence by the ISO at *bid price*, rather than at either the Market Clearing Price for Decremental Energy or the unit's marginal cost. The difference in payment for each decremental MWh called out-of-sequence is based on the *bid price*, less the *minimum* of the real time MCP or the unit's decremental marginal cost.<sup>6</sup>

***Example 1***

***CONFIDENTIAL INFORMATION REDACTED***

*Example 2*

***CONFIDENTIAL INFORMATION REDACTED***

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<sup>6</sup> Decremental marginal cost based on lowest positive incremental heat rate for heat rate curve submitted to

*Example 3*

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the ISO, multiplied by spot market gas prices plus \$6 O&M.

*Example 4*

***CONFIDENTIAL INFORMATION REDACTED***


*Example 5*

***CONFIDENTIAL INFORMATION REDACTED***

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Executed on April 29, 2002.

County of Sacramento  
State of California  
Subscribe and sworn before  
me on this 29th day of  
April, 2002:

  
\_\_\_\_\_  
Notary Public



Eric Hildebrandt

My Commission Expires: July 30, 2004





**ATTACHMENTS**

**EXAMPLES 1-5**

***CONFIDENTIAL INFORMATION REDACTED***