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June 14, 2007

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

Re: California Independent System Operator Corporation
Docket No. ER07-____- 000
June 2007 Reference Price Amendment

Dear Secretary Bose:

Pursuant to Section 205 of the Federal Power Act ("FPA"),[1] 16 U.S.C. § 824d, and Section 35.13 of the regulations of the Federal Energy Regulatory Commission ("Commission"), 18 C.F.R. § 35.13, the California Independent System Operator Corporation ("CAISO") respectfully submits for filing an original and five copies of an amendment to the ISO Tariff (the "June 2007 Reference Price Amendment" or "Amendment"). The CAISO submits this filing in order to incorporate into the ISO Tariff details concerning the means by which Potomac Economics ("Potomac") calculates bid-based reference prices for the CAISO. The CAISO respectfully requests that the Commission approve the Amendment to be effective sixty days after submittal of the instant filing, *i.e.*, on August 14, 2007.

Two extra copies of this filing are also enclosed. Please stamp these copies with the date and time filed and return them to the messenger.

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1 Capitalized terms not otherwise defined herein have the meanings set forth in the Master Definitions Supplement, Appendix A to the ISO Tariff.

I. BACKGROUND

A. Calculation of Bid-Based Reference Prices by Potomac Pursuant to the ISO Tariff[2]

The CAISO uses bid-based reference prices (also called bid-based reference levels) as part of its Automatic Mitigation Procedure ("AMP") and to settle bids dispatched out-of sequence for Intra-Zonal Congestion. As required by the Commission,[3] Potomac, as an independent entity, calculates the bid-based reference prices independently of the CAISO, pursuant to two similarly but not identically worded sections of the ISO Tariff: Section 27.1.1.6.1.1,[4] which is used to manage Intra-Zonal Congestion and specifies how decremental bid reference prices are calculated, and Section 3.1.1.1 of Attachment A to Appendix P ("Section 3.1.1.1"), which is used to impose market power mitigation measures under the AMP and specifies how incremental bid reference prices are calculated. Section 3.1.1.1 and Section 27.1.1.6.1.1 each contain a five-step process for determining bid-based reference prices. In the first step of this process, Potomac identifies which of the entity's bids to include in the calculation of the bid-based reference price. The issue addressed in this Amendment is whether non-positive bids should be included in the calculation.

An incremental bid or a decremental bid can be either positive or non-positive (*i.e.*, negative or zero). As relevant here, an incremental bid is an offer to increase output of a resource, so a non-positive incremental bid is an offer to increase output for no compensation, or, if the bid is negative, an offer to pay for increasing output. In practice, a resource owner submitting a non-positive incremental bid is not indicating its willingness to accept no compensation for its energy or to pay for providing it. Rather, the resource owner is attempting to ensure that its resource's output is included in the CAISO's energy market and it receives the market clearing price established by other resources' positive incremental bids. A non-positive decremental bid is an offer to decrease output for no compensation, or, if the bid is negative, an offer to reduce output if the resource is paid the bid amount.

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2 This Section I.A, and also Section I.B, repeat information contained in the CAISO white paper ("White Paper") found in Attachment E to this Amendment, which was posted on the ISO Website for stakeholder review as described in Section II.C, below.

3 *See California Independent System Operator Corp.*, 101 FERC ¶ 61,061, at P 38 (2002); *California Independent System Operator Corp.*, 103 FERC ¶ 61,265, at PP 40-41, 54 (2003); *California Independent System Operator Corp.*, 107 FERC ¶ 61,042, at P 46 (2004).

4 Section 27.1.1.6.1.1 was numbered as Section 7.2.6.1.1 in the old conformed ISO Tariff, and was assigned its current section number in the Simplified and Reorganized ISO Tariff that went into effect in 2006.

1. Existing ISO Tariff Language

Section 3.1.1.1 was added to the ISO Tariff in the proceeding concerning Amendment No. 44 to the Tariff.[5] Section 3.1.1.1 is used "[f]or purposes of establishing reference levels"[6] based on incremental bids. That section states in relevant part that, under step one of the five-step process, "[a] reference level for each bid segment[7] shall be calculated" by "[e]xcluding proxy and mitigated bids" and shall be based on "the accepted bid, or the lower of the mean or median of a resource's accepted bids if such a resource has more than one accepted bid in competitive periods over the previous 90 days for peak and off-peak periods . . . ."[8] Section 3.1.1.1 does not explicitly address whether non-positive incremental bids should be included in or excluded from the calculation of bid-based reference prices.

Section 27.1.1.6.1.1 was added to the ISO Tariff in the proceeding concerning Amendment No. 50 to the Tariff.[9] Section 27.1.1.6.1.1 states in relevant part that, under step one of the five-step process, "[d]ecremental bid reference levels shall be determined by . . . [e]xcluding proxy bids, mitigated bids, and bids used out of merit order for managing Intra-Zonal Congestion" and shall be based on "the accepted decremental bid, or the lower of the mean or the median of a resource's accepted decremental bids if such a resource has more than one accepted decremental bid in competitive periods over the previous 90 days for peak and off-peak periods . . . ."[10] However, Section 27.1.1.6.1.1 does not explicitly state whether non-positive decremental bids should be included in or excluded from bid-reference price calculations.

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5 *See* http://www.caiso.com/docs/2002/09/13/2002091314185514582.html (providing ISO Governing Board materials that include Board approval of original version of Section 3.1.1.1); Amendment No. 44 to the ISO Tariff, Docket No. ER02-1656-000, at Attachment N (May 1, 2002) (containing Section 3.1.1.1 as originally filed); *California Independent System Operator Corp.* 100 FERC ¶ 61,060, at P 70 (2002), *order on reh'g*, 101 FERC ¶ 61,061, at PP 31-40 (approving Section 3.1.1.1 subject to requirement that independent entity calculate reference prices, and other requirements not relevant here).

6 Section 3.1.1.1(a).

7 Under Section 3.1.1.1, for purposes of establishing reference prices, the capacity of each generation is divided into 10 equal energy bid segments between its minimum (Pmin) and maximum (Pmax) operating point. Section 3.1.1.1(a)(1).

8 Section 3.1.1.1(a)(1).

9 *See* Amendment No. 50 to the ISO Tariff, Docket No. ER03-683-000, Transmittal Letter at 2 (Mar. 31, 2003) (explaining that proposed modifications were conceptually approved by ISO Governing Board); *California Independent System Operator Corp.* 103 FERC ¶ 61,265, at PP 40-41, 54 (2003) (directing the independent entity that determines the reference prices for the AMP to calculate decremental bid reference prices); CAISO Compliance Filing, Docket No. ER03-683-003 (July 18, 2003) (providing Section 7.2.6.1.1 in compliance with Commission's directives); *California Independent System Operator Corp.* 100 FERC ¶ 61,060, at Ordering Paragraph (A) (2004) (accepting ISO Tariff revisions to comply with Commission's directives, subject to requirements not relevant here),

10 Section 27.1.1.6.1.1(a)(1).

2. Potomac's Treatment of Non-Positive Bids in the Calculation of Bid-Based Reference Prices

Potomac has always excluded, and continues to exclude, all non-positive incremental bids from its calculations of bid-based reference prices under Section 3.1.1.1. Potomac's practice of excluding non-positive incremental bids was disclosed to Market Participants in a document containing "Frequently Asked Questions" that was posted on the ISO Website on December 4, 2002 (the "FAQ"). On December 5, 2002, the CAISO issued a market notice announcing the posting of the FAQ and including it as an attachment.[11]

The CAISO started using decremental bid reference prices in Intra-Zonal Congestion Management in 2003. In June 2003, Potomac prepared a memorandum (the "Potomac Memorandum") describing how decremental bid reference prices would be calculated under Section 27.1.1.6.1.1 and the CAISO circulated that memorandum by market notice issued on June 23, 2003.[12] The Potomac Memorandum indicated that Potomac would be calculating decremental bid reference prices in the same way that it calculated incremental bid reference prices, except for specifically identified differences. The Potomac Memorandum did not identify Potomac's practice with regard to the exclusion of non-positive bids as a difference between how Potomac would calculate decremental bid reference prices and how it was already calculating incremental bid reference prices (as disclosed in the FAQ). Therefore, it was implicit in the Potomac Memorandum that Potomac would be excluding non-positive decremental bids from its calculations of decremental bid reference prices, just as Potomac excluded non-positive incremental bids from its calculations of incremental bid reference prices.

From 2003 until July 21, 2006, Potomac's practice was to exclude all non-positive decremental bids from its calculations of decremental bid reference prices under Section 27.1.1.6.1.1. Potomac changed its practice of excluding non-positive decremental bids on July 21, 2006 following an inquiry from a single Market Participant that had erroneously submitted a high positive decremental bid (*i.e.*, a bid that exceeded the Market Participant's avoided costs), which had resulted in the establishment of a high (positive) decremental bid reference price.

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11 Copies of the December 5, 2002 market notice and the FAQ are provided in Attachment C to this Amendment. A copy of the FAQ was also included as an attachment to the White Paper provided in Attachment E to this Amendment.

12 Copies of the June 23, 2003 market notice and the Potomac Memorandum are provided in Attachment D to this Amendment. The market notice stated that the CAISO had held a conference call earlier that day with Market Participants and Potomac to discuss "the Decremental (DEC) Reference Pricing Methodology" and that the methodology would be implemented on July 1, 2003. The market notice stated that the Potomac Memorandum was provided to "clarify[ ] some points that were brought up in today's discussion." The market notice and the Potomac Memorandum were also included as attachments to the White Paper provided in Attachment E to this Amendment.

Potomac determined that inclusion of non-positive decremental bids in the calculation of the decremental bid reference price would have resulted in a lower decremental bid reference price because the erroneous high bid would have been offset, in part, by non-positive decremental bids. Because Potomac was not constrained by specific ISO Tariff language stating that non-positive decremental bids were required to be excluded, Potomac recalculated the decremental bid reference price and, since July 21, 2006, Potomac has included all non-positive accepted bids in its decremental bid reference price calculations.

Except for the one Market Participant inquiry described above, the CAISO is not aware of any instance where a Market Participant had raised any concerns about how decremental bid (or incremental bid) reference prices are calculated with respect to the treatment of non-positive bids.

B. Reasons for This Amendment

The CAISO decided to move forward with preparing this Amendment after carefully weighing the considerations discussed below.

The existing language in Sections 3.1.1.1 and 27.1.1.6.1 does not expressly address whether non-positive bids should be included in or excluded from the calculation of bid-based reference prices and, therefore, the language provides sufficient latitude for Potomac to exercise its independent discretion either to include or exclude non-positive bids. Each of the sections states that reference levels may be determined on the basis of accepted bids, and both possible methods of calculating reference prices (*i.e.*, with and without including non-positive bids) are based on accepted bids.

Further, Potomac is not simply limited to "plugging in" numbers using the ISO Tariff provisions for calculating reference levels, but is permitted to make independent determinations to implement those provisions so long as those determinations are consistent with the Tariff.[13] Based on economic logic, Potomac independently decided whether to include or exclude non-positive bids from its calculations of bid-based reference prices. The economic logic underlying Potomac's practice of excluding non-positive incremental bids is that: (a) the bid-based reference prices are intended to serve as proxies for the marginal cost of a resource, based on the bids submitted by its owner during workably competitive periods; and (b) non-positive incremental bids do not typically reflect the resource's marginal cost, but instead signal the resource's willingness to be a "price-taker," *i.e.*, to accept whatever clearing price results in the CAISO market. The economic logic underlying Potomac's initial practice of

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13 *See California Independent System Operator Corp.*, 111 FERC ¶ 61,061, at P 33 (2002) (discussing Potomac's ability to exercise of independent judgment in performing calculations pursuant to Section 3.1.1.1).

excluding non-positive decremental bids, and its later practice of including non-positive incremental bids, is that each of these practices results in the establishment of decremental bid reference prices that should not exceed avoided costs, provided the bids offered on behalf of a resource are not in excess of avoided costs.[14] Indeed, Potomac changed its practice only because a single entity had erroneously submitted a high positive bid, which caused a high reference level to be calculated using the original approach.

The consideration to which the CAISO gave the greatest weight, however, is its belief that the bid-based reference prices for incremental bids and decremental bids should be calculated consistent with the publicly disclosed information provided in the FAQ and the Potomac Memorandum and that any changes in practice should only be implemented following notice to interested stakeholders and an opportunity to comment. Accordingly, the CAISO reached the conclusion that it should prepare and file an amendment to the ISO Tariff to provide the detail that non-positive bids are to be excluded from the calculation of both incremental and decremental bid reference prices.[15]

C. Discussions with CAISO Stakeholders

On May 2, 2007, the CAISO issued a market notice that included the White Paper as an attachment; the market notice stated that the White Paper was provided for stakeholder comment, that the CAISO requested any written comments from stakeholders by May 16, 2007, and that the CAISO would hold a conference call on May 23, 2007 to discuss stakeholders' comments and questions.[16] The CAISO received written comments from three Market Participants: Pacific Gas and Electric Company ("PG&E"), Southern California Edison Company ("SCE") and Williams Power Company ("Williams").[17] Both PG&E and SCE indicated their support for the proposed ISO Tariff amendment. In addition, PG&E questioned whether there was an alternative in the event that no positive bids were available. Williams offered a comment and a question.

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[14] See the White Paper provided in Attachment E to this Amendment, at 2, 4. The White Paper (at 4) also contains more support based on economic theory for the practice of excluding non-positive bids from the calculation of decremental bid reference prices.

[15] This conclusion is supported and informed by the Commission's recent pronouncement in Order No. 890 that implementation details not included in a tariff must be publicly available and should not be changed without notice to affected Market Participants. *Preventing Undue Discrimination and Preference in Transmission Service,* Order No. 890, 72 Fed. Reg. 12266 (Mar. 15, 2007), FERC Stats. & Regs., Regs. Preambles ¶ 31,241, at PP 1649-1655 (2007). Moreover, the detail in question could, in a circumstance such as the one that prompted Potomac to start including non-positive bids in its calculation of decremental bid reference prices, substantially affect rates. If rates are substantially affected, the "rule of reason" employed by the courts and the Commission suggests that the detail should be included in the ISO Tariff. *See City of Cleveland v. FERC*, 773 F.2d 1368, 1376 (D.C. Cir. 1985).

[16] Attachment E to this Amendment contains copies of both the May 2, 2007 market notice and the White Paper.

[17] These stakeholder comments are provided in Attachment F to this Amendment.

First, Williams commented that the CAISO's proposal "emphasizes the need for the CAISO to ensure that all relevant details are in the CAISO Tariff and not only in a Business Practice Manual." Second, Williams asked whether it was necessary, pursuant to Section 15 of the ISO Tariff, to obtain the authorization of the ISO Governing Board to file the instant Tariff amendment.

The CAISO held the May 23 conference call as planned, at which time the CAISO responded to the written comments. In response to PG&E's comments, the CAISO noted that calculating bid-based reference levels is just one of several possible means of determining reference levels, and thus, in the event it is not possible to calculated bid-based reference levels there would, indeed, be alternatives.[18] In response to Williams' comment, the CAISO noted its ongoing responsibility to ensure that, consistent with the "rule of reason," details that substantially affect rates, terms, or conditions be included in the ISO Tariff.[19] In response to Williams' question, the CAISO noted that it had prior Board approval for the ISO Tariff amendment filings in the proceedings in which the Commission approved Sections 3.1.1.1 and 27.1.1.6.1.1,[20] and that the CAISO was simply including a detail that could have been included at the time, which was consistent with the publicly disclosed documentation developed in the stakeholder process, but which was not included then.

On May 31, 2007, the CAISO issued a market notice stating that the CAISO was posting draft ISO Tariff language to implement its proposed Tariff amendment and requested any written stakeholder comments by June 7, 2007.[21] The CAISO received no written comments.

II. PROPOSED ISO TARIFF CHANGES

The CAISO proposes to modify step (1) of Section 3.1.1.1(a)(1) and Section 27.1.1.6.1.1(a)(1) to state that non-positive incremental and decremental bids, respectively, will be excluded from the calculation of bid-based reference prices.

III. EFFECTIVE DATE

The CAISO requests that the Commission make this Amendment effective sixty days after submittal of the instant filing, *i.e.*, on August 14, 2007.

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18 See the steps, other than the first step, listed in Sections 3.1.1.1 and 27.1.1.6.1.1.

19 *See supra* footnote 15.

20 *See supra* footnotes 5 and 9.

21 A copy of the May 31, 2007 market notice is provided in Attachment G to this Amendment. The draft ISO Tariff language that the CAISO posted is the same as the Tariff language proposed in the Amendment.

IV. COMMUNICATIONS

Communications regarding this filing should be addressed to the following individuals, whose names should be placed on the official service list established by the Secretary with respect to this submittal:

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V. SERVICE

The CAISO has served copies of this transmittal letter, and all attachments, on the California Public Utilities Commission, the California Energy Commission, the California Electricity Oversight Board, and all parties with effective Scheduling Coordinator Service Agreements under the ISO Tariff. In addition, the CAISO is posting this transmittal letter and all attachments on the ISO Website.

VI. ATTACHMENTS

The following documents, in addition to this transmittal letter, support the instant filing:

Attachment A	Revised ISO Tariff sheets that incorporate the June 2007 Reference Price Amendment
Attachment B	The June 2007 Reference Price Amendment shown in black-line format
Attachment C	December 5, 2002 market notice and the FAQ, which was attached to that market notice
Attachment D	June 23, 2003 market notice and the Potomac Memorandum, which was attached to that market notice

Attachment E	May 2, 2007 market notice and the White Paper, which was attached to the market notice
Attachment F	Written comments from stakeholders
Attachment G	May 31, 2007 market notice

VII. CONCLUSION

For all the foregoing reasons, the Commission should approve the June 2007 Reference Price Amendment as filed. Please feel free to contact the undersigned if you have any questions concerning this matter.

Respectfully submitted,

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Attachment A – Clean Sheets

Bid-Based Reference Price Amendment Filing

If a Generating Unit shut down according to this Section 27.1.1.6.1 cannot start up in time to meet its next day's Energy Schedules, the ISO shall charge the Scheduling Coordinator for that Generating Unit the lesser of the decremental reference price or the Market Clearing Price at the operating level set forth in the relevant Energy Schedule for any deviation from the next day's Final Day-Ahead Schedules for Energy caused by such shut-down. Charges set forth in this Section 27.1.1.6.1 shall not apply to (1) Reliability Must-Run Units operating solely under their Reliability Must-Run Contracts or (2) units operating during a Waiver Denial Period in accordance with the must-offer obligation.

The ISO shall apply the decremental reference prices to thermal Generating Units and to non-thermal Generating Units. If a Generating Unit is instructed by the ISO to shut down to manage Intra-Zonal Congestion, and is subsequently re-started, the Owner of that Generating Unit may invoice the ISO for the lesser of (1) the Start-Up Costs incurred and (2) the costs of keeping the Generating Unit warm to meet its Energy Schedules as set forth in Section 40.12.6. If the ISO Dispatches System Resources or Dispatchable Loads to alleviate Intra-Zonal Congestion, the ISO shall Dispatch those resources in merit order according to the resource's Day-Ahead or Hour-Ahead Adjustment Bid or Imbalance Energy bid.

The ISO shall only Redispatch Regulatory Must-Take or Regulatory Must-Run Generation, Intermittent Resources, or Qualifying Facilities to manage Intra-Zonal Congestion after Redispatching all other available and effective generating resources, including Reliability Must-Run Units.

27.1.1.6.1.1 Decremental Bid Reference Levels. Decremental bid reference levels shall be determined for use in managing Intra-Zonal Congestion as set forth above in Section 27.1.1.6.1.

(a) Determination. Decremental bid reference levels shall be determined by applying the following steps in order as needed:

1. Excluding non-positive bids, proxy bids, mitigated bids, and bids used out of merit order for managing Intra-Zonal Congestion, the accepted decremental bid, or the lower of the mean or the median of a resource's accepted decremental bids if such a resource has more than one accepted decremental bid in competitive periods over the previous 90 days for peak and off-peak periods, adjusted for daily changes in fuel prices using gas price determined by Equation C1-8 (Gas) of the Schedules to the Reliability Must-Run Contract for the relevant Service Area (San Diego Gas & Electric Company, Southern California

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 3.1.1.1:

For Energy Bids to be Dispatched as Imbalance Energy through the RTD Software: the lower of a 200 percent increase or $100/MWh increase in the bid with respect to its Reference Level.

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 (Pmin) and maximum (Pmax) operating point.

A reference level for each bid segment shall be calculated each day 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. Excluding non-positive, proxy and mitigated bids, the accepted bid, or the lower of the mean or the median of a resource's accepted bids if such a resource has more than one accepted bid in competitive periods over the previous 90 days for peak and off-peak periods, adjusted for daily changes in fuel prices using gas price determined by Equation C1-8 (Gas) of the Schedules to the Reliability Must-Run Contract for the relevant Service Area (San Diego Gas & Electric Company, Southern California Edison Company, or Pacific Gas and Electric Company), or, if the resource is not served from one of those three Service Areas, from the nearest of those three Service Areas. Accepted and justified bids above the applicable soft cap, as set forth in Section 39.2 of this Tariff, will be included in the calculation of reference prices.

Attachment B – Blacklines

Bid-Based Reference Price Amendment Filing

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27.1.1.6.1.1 Decremental Bid Reference Levels. Decremental bid reference levels shall be determined for use in managing Intra-Zonal Congestion as set forth above in Section 27.1.1.6.1.

(a) Determination. Decremental bid reference levels shall be determined by applying the following steps in order as needed:

1. Excluding non-positive bids, proxy bids, mitigated bids, and bids used out of merit order for managing Intra-Zonal Congestion, the accepted decremental bid, or the lower of the mean or the median of a resource's accepted decremental bids if such a resource has more than one accepted decremental bid in competitive periods over the previous 90 days for peak and off-peak periods, adjusted for daily changes in fuel prices using gas price determined by Equation C1-8 (Gas) of the Schedules to the Reliability Must-Run Contract for the relevant Service Area (San Diego Gas & Electric Company, Southern California Edison Company, or Pacific Gas and Electric Company), or, if the resource is not served from one of those three Service Areas, from the nearest of those three Service Areas. There will be a six-day time lag between when the gas price used in the daily gas index is determined and when the daily gas index based on that gas price can be calculated. For the purposes of this Section 27.1.1.6.1, to determine whether accepted decremental bids over the previous 90 days were accepted during competitive periods, the independent entity responsible for determining reference prices will apply a test to the prior 90-day period. The test will require that the ratio of a unit's accepted out-of-sequence decremental bids (MWh) for the prior 90 days to its total accepted decremental bids (MWh) for the prior 90 days be less than 50 percent. If this ratio is greater or equal to 50%, accepted decremental bids will be determined to have been accepted in non-competitive periods and cannot be used to determine the decremental reference price. This test would be applied each day on a rolling 90-day basis. One ratio would be calculated for each unit with no differentiation for various output segments on the unit. Accepted and justified decremental bids below the applicable soft cap, as set forth in Section 39.3 of this Tariff, will be included in the calculation of reference prices;

2. 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, and

provided the Market Participant has provided sufficient data in accordance with specifications provided by the independent entity responsible for determining reference prices;

3. 90 percent of the unit's default Energy Bid determined monthly as set forth in Section 40.7.5 (based on the incremental heat rate submitted to the independent entity responsible for determining reference prices, adjusted for gas prices, determined according to paragraph (a)(1) above, and the variable O&M cost on file with the independent entity responsible for determining reference prices, or the default O&M cost of $6/MWh);

4. 90 percent of the mean of the economic Market Clearing Prices for the units' relevant location 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 determined according to paragraph (a)(1) above; 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 independent entity responsible for determining reference prices shall determine a reference level on the basis of:

i. the independent entity'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 independent entity; or

ii. an appropriate average of competitive bids of one or more similar electric Facilities.

(b) Monotonicity. The decremental bid reference levels ($/MWh bid price) for the different bid segments of each resource shall be made monotonically non-decreasing by the independent entity responsible for determining reference prices by proceeding from the highest MW bid segment moving through each lower MW bid segment. The reference level of each succeeding bid segment, moving from right to left in order of decreasing operating level, shall be the lower of the reference level of the preceding bid segment or the reference level determined according to paragraph (a) above.

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ISO TARIFF APPENDIX P

Attachment A

Conduct Warranting Mitigation

* * *

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 (Pmin) and maximum (Pmax) operating point.

   A reference level for each bid segment shall be calculated each day 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. Excluding non-positive, proxy and mitigated bids, the accepted bid, or the lower of the mean or the median of a resource's accepted bids if such a resource has more than one accepted bid in competitive periods over the previous 90 days for peak and off-peak periods, adjusted for daily changes in fuel prices using gas price determined by Equation C1-8 (Gas) of the Schedules to the Reliability Must-Run Contract for the relevant Service Area (San Diego Gas & Electric Company, Southern California Edison Company, or Pacific Gas and Electric Company), or, if the resource is not served from one of those three Service Areas, from the nearest of those three Service Areas. Accepted and justified bids above the applicable soft cap, as set forth in Section 39.2 of this Tariff, will be included in the calculation of reference prices.

   2. If the resource is a gas-fired unit that does not have significant energy limitations, the unit's default Energy Bid determined monthly as set forth in Section 5.11.5 (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 (a) above.

* * *

Attachment C

From: CRCommunications
Sent: Thursday, December 05, 2002 3:48 PM
To: ISO Market Participants
Subject: CAISO Notification - AMP FAQ's

MARKET NOTICE

Amp Frequently Asked Questions

December 5, 2002

On December 4, 2002, the ISO posted on the MD02 web site question and answers relevant to the AMP reference level calculation services. The document contains a Q&A format of Frequently Asked Questions as written by Potomac Economics. The document is titled "AMP Reference Level - Frequently Asked Questions, Responses by Potomac Economics." The document can be accessed at <http://www.caiso.com/docs/2002/08/23/200208231414018652.html>.

If you have any questions regarding the document, please contact Michael Wander at Potomac Economics by telephone at (703) 383-0724 or by email at mwander@potomaceconomics.com mailto:mwander@potomaceconomics.com.

Client Relations Communications.0621

CRCommunications@caiso.com

Market Participants - Frequently Asked Questions

Sources for Reference Levels

Q. What is the source of my reference level (RL)?

A. The ISO will soon be posting additional information which will identify the source of each RL. The information will identify the source (e.g. bid-based, heat-rate/default based) for each peak and off-peak RL.

Q. What are the potential sources for RLs?

A. There are principally 5 possible sources for RLs for generators that are applied in the following order of priority if available: 1) bid-based (from accepted bids in past 90 days); 2) consultation-based (based on data submitted by market participant); 3) default-based (based on heat-rates and O&M costs submitted to ISO); 4) MCP-based (based on clearing prices at the resources location during hours and levels the resource was operating); 5) estimate-based (based on estimates by ISO or Potomac Economics).

Q. What if operating conditions or other circumstances change such that the past 90 days do not reflect current or on-going operating conditions?

A. If a demonstration is made by MPs that current operating conditions are dissimilar from past 90 days, the RL may be temporarily adjusted to reflect such conditions.

Interpreting Reference Levels

Q. How do I interpret the prices (P's) and quantities (Q's) for my RLs?

A. There are 10 RLs represented by 11 prices (P1-P11) and quantities (Q1-Q11) for each resource. The P's and Q's should be interpreted in the same manner as the supplemental energy bids submitted by market participants, that is, P1 is the price of a bid segment that begins at Q1 and ends at Q2. The last price, P11 is the price at the end of the last segment.

Q. How are Q's (buckets sizes) determined for generators?

A. For generators, the 10 bucket sizes (defined by 11 Q's) are based on minimum and maximum generation data submitted to the ISO by MPs. The bucket size for each RL is simply the operating range divided by 10.

Q. How are bucket sizes determined for loads?

A. For loads, the 10 buckets are spaced evenly between the minimum and maximum load reduction capabilities. These reduction capabilities are taken from static resource data, but are revised downward if the load resource has not scheduled or dispatched at that level in the preceding 12 months.

Bid-Based Reference Levels

Q. How are bid-based RLs determined?

A. Bid-based RLs are the lower of the mean or median of accepted bids, adjusted for fuel price changes, in the past 90 days.

Q. What is an accepted bid for purposes of bid-based RLs?

A. Any bid to supply energy (or reduce consumption) in the ISO's real-time energy market that is dispatched (accepted).

Q. Are decremental bids included (prior to Oct. 30 single energy bid format)?

A. No. Decrement bids (and dispatches) for generators are not considered as accepted bids, only incremental bids and incremental dispatches. For loads on bids to curtail and decrements (load reductions) are considered to be accepted bids.

Q. Are zero bids and bids based on proxy bids included in RLs?

A. Bids less than or equal to zero and bids based on proxy bids are excluded from bid-based RLs.

Q. Are RMR dispatches included in RLs?

A. No, RMR dispatches are excluded from bid-based.

Q. How are hourly schedules used in determining RLs?

A. Final hourly schedules are used to determine the portion the energy bid-curve being accepted in the BEEP dispatches. For example, a real-time dispatch of 10 MW in an hour with an hourly schedule (including any RMR schedules) of 100 MW would correspond to an output range on the bid curve from 100 MW to 110 MW (10 MW dispatch on top of 100MW hourly schedule).

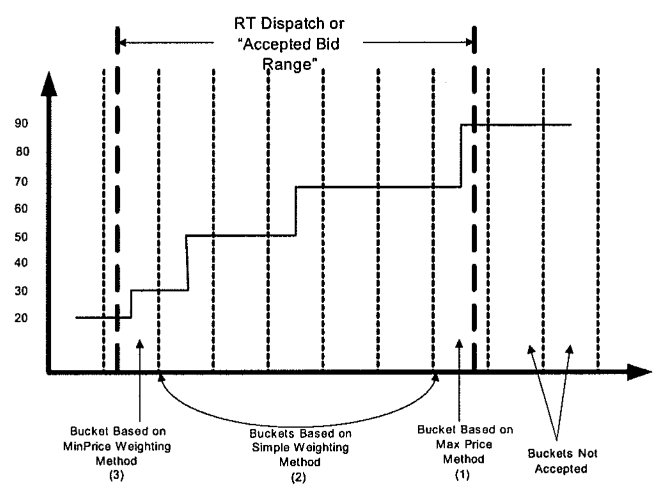
Q. What accepted ranges are included in the calculation of bid-based RLs for loads?

A. The range used to calculate bid-based references for loads is between the maximum consumption level and the hourly scheduled consumption for the hour. For example, in the case of a 300 MW load (where the load has demonstrated the capability of consuming 300 MW) with a 130 MW schedule, and a decrement of 20 MW in the RT Beep market (a load reduction bid was dispatched 20 MW during the hour) the accepted range would be from 110 MW to 130 MW.

Q. Within an hour, many bid segments from an energy bid curve (at many different bid prices) may be dispatched that fall in the same bucket. What price would be assigned to that bucket for that hour?

A. The portion of any bid-segment dispatched within a bucket is used in computing a weighted average price for that bucket in that hour. There are 3 possible methods as illustrated in the following diagram: 1) if only part of the bucket is accepted and the bucket is at the top of the dispatch range for the hour than the highest accepted bid price is used as the bid price for the bucket, 2) if the entire bucket is accepted, a weighted average bid-price (weighted on the number of megawatts of each bid segment in the bucket) is used to determine the hourly bid price for the bucket, 3) if part of the bucket is accepted and part of the bucket is included in the hourly schedule from the MP, and the bucket is below the top of the accepted range, the weighted average price is calculated using the minimum accepted bid price for the portion of the bucket covered by the hourly schedule. This methodology is depicted graphically in the following figure.

Method for Determining Hourly Bucket Prices
from Accepted Bid Segments



Q. Prior to Oct. 30 real-time energy bids were submitted separately for different service types (supplemental energy, spinning reserves, replacement reserves, etc.) and bids were relative to any hourly schedules (e.g. a bid to provide 30 MW of supplemental energy in an hour with an hourly schedule of 100 MW would be from 100 MW to 130 MW on the absolute output curve). How are pre-Oct 30 bids being compared to the single energy bids being submitted starting Oct. 30, 2002?

A. Multi-service bids submitted prior to Oct. 30 were "stacked" based on the price of the bid segment to form a single energy bid curve. For example, if the supplemental energy bids were $10, $20, $50 in an hour with a spinning reserve bid of $40, the spinning reserve bid segment would be stacked between the 2nd and 3rd supplemental energy bid segments. The stacked bids are then stacked on top of any hourly or RMR schedules to make them comparable to bids starting Oct. 30.

Q. How are fuel price adjustments made?

A. Daily fuel prices are provided by the ISO (the same as posted on the ISO web page) that are based on monthly natural gas prices. Each accepted hourly bucket price is indexed to the most current gas price. For example, if the historical gas price on the day the bid was accepted was $2.50 and the current gas price is $5.00 then accepted bid price for that day would be doubled to index bids for the current day RL calculation. The RL adjustments for fuel price changes are subject to an absolute adjustment (up or down) limited to the change in fuel costs of a unit with a heat rate of 20,000 Btu/kwh. (See documentation for more details).

Q. What if bid-based RL does not accurately reflect current incremental energy costs?

A. MP should provide Potomac Economics supplemental reference information (Submittal Form available on ISO web page) and/or contact Potomac Economics to provide additional documentation to enable the development of an adjusted RL.

MCP-Based Reference Levels

Q. How are MCP-based RLs determined?

A. The MCP-based references are based on the lowest quartile of fuel-adjusted MCPs in hours where a resource was operating. This calculation is performed separately for each bucket so that the set of MCPs used will depend on how frequently the output range represented by each bucket was operating.

Q. What operating ranges are included in the calculation of MCP-based RLs for generators?

A. The operating range applicable for a particular hour includes everything below and up to the hourly schedule, plus the maximum positive real-time dispatch during the hour with just one exception. The output range below the scheduled RMR obligation for a particular hour is not included in the calculation of MCP-based references. For example, in the case of a 300 MW generator with a 130 MW schedule and 100 MW RMR obligation, the MCP for that hour would be based on the range beginning at 100 MW and ending at 130 MW.

Q. What operating ranges are included in the calculation of MCP-based RLs for loads?

A. The range used to calculate MCP-based references for loads is between the maximum consumption level and the consumption for the hour. For example, in the case of a 300 MW load (where the load has demonstrated the capability of consuming 300 MW) with a 130 MW schedule, the MCP range for that hour would begin at 130 MW and end at 300 MW.

Q. Are RMR schedules or dispatches included in the MCP RLs?

A. No, RMR schedules and dispatches are not included in MCP-based RLs.

Q. Are zero or negative clearing prices included in the MCP-based RLs?

A. No, zero or negative MCPs are excluded prior to determining the lowest quartile of MCPs.

Q. Are accepted decremental bids counted in operating ranges?

A. If a resource is dispatched down for every interval of an hour, the output range would be the hourly schedule minus the downward dispatch quantity. For example, for a resource with an 80 MW hourly schedule that is dispatched down 10 MW for the entire hour, the operating range for the MCP calculation would be 0 to 70 MW (80 MW schedule less 10 MW decrement).

Q. What if there are less than 4 hours that the resource operated in a range corresponding to a particular bucket?

A. A single hourly value (the lowest) will be used when there are between 1 and 4 operating hours in a bucket, 2 hours when there are between 5 and 8 operating hours, 3 when there are between 9 and 12 operating hours and so on.

Q. If a resource operates to a level equal to the beginning of a bucket (e.g. hourly schedule plus dispatch to 110 MW and bucket from 110 MW to 130 MW) is the MCP applicable for that bucket in that hour?

A. No, the resource must be operating in the range inside the bucket for that hour to be included in the MCP-based reference.

Q. How are fuel price adjustments made for MCP-based RLs?

A. Daily fuel prices are provided by the ISO (the same as posted on the ISO web page) that are based on monthly natural gas prices. The MCP in each hour the resource operated are indexed to the most current gas price. For example, if the historical gas price on the day the MCP was determined was $2.50 and the current gas price is $5.00 then the MCP would be doubled for that day in the calculation of its current RL.

Default-Based Reference Levels

Q. What is my default-based RL based on?

A. Default-based RLs are based upon heat-rate and Operation and Maintenance (O&M) data provided to the ISO by the MP and the latest available natural gas price.

Q. What if MP has not provided heat-rate or O&M information to the ISO?

A. If no heat-rate information is provided to the ISO, then no default-based RL will be calculated. If no O&M data is provided, $6/MWH is used as an estimate. If heat-rate information does not extend to zero, average heat rates will be extended to zero. If heat-rate information does not extend to the maximum output ranges of resource, no default-based RL will be calculated for those output ranges. Units with zero heat rates will be treated as if the data is missing.

Q. How are incremental energy costs calculated from the average heat rate information provided to the ISO?

A. The incremental energy costs are calculated as the change in the average heat rate from one output level to the next. The formula for this calculation is as follows:

$$Inc_i=(MW_{i+1}*AVEHR_{i+1}-MW_i*AVEHR_i)/(MW_{i+1}-MW_i)$$

where:

Inc_i = incremental heat rate at level i
MW_i=MW level at i (left edge of bucket i)
$AVEHR_i$= Average heat rate at level i (from data submitted by MP)

If only a single average heat rate value is provided, it is used as the incremental heat rate for the entire curve.

Q. What if the resource does not burn natural gas, is energy limited, or has incremental energy costs that are not accurately estimated by a default-based RL?

A. MP should provide Potomac Economics supplemental reference information (Submittal Form available on ISO web page) to enable the development of a consultative RL.

Consultative-Based Reference Levels

Q. When are Consultative-based RLs applied?

A. If a MP demonstrates that a default-based RL is inappropriate for some or all of the output range of a resource, and the MP provides sufficient information to Potomac Economics to determine an appropriate RL, a consultative RL will be applied with a priority over the default-based RL.

Q. How do MP's request that a consultative RL be applied?

A. MP should provide Potomac Economics Supplemental Reference Information (Submittal Form available on ISO web page) to enable the development of a consultative reference.

Estimate-Based Reference Levels

Q. When are Estimate-based RLs applied?

A. If no other source (e.g. bid-based, default-based, MCP-based) for a RL is available, an Estimate-based RL may be applied. The estimate, at the discretion of Potomac Economics, may be based on RLs for similar units and/or information provided by the ISO, information submitted to Potomac Economics on the Supplemental Information Form, or information as available from public sources.

Combining Sources of Reference Levels and Preparing Final RLs

Q. How are sources combined?

A. The potential sources for RLs (adjusted, bid-based, default, consultation-based, MCP-based, estimate-based) are combined for each resource, bucket, and time period (peak and off-peak) based on the priority of the source. The highest priority source is kept and all other RLs for a bucket and time-period for a resource are discarded.

Q. Once different sources are combined to make a single curve for each time period, are there any adjustments?

A. Yes, after the sources are individually combined for each bucket and time period, a test is done to ensure that resulting reference curve is non-decreasing. The test is applied from lower to higher output ranges for generators and from lower to higher curtailments for loads (thus RLs will only be raised, not lowered in this process).

Q. What if there are gaps or the curves do not extend to the lowest or highest output ranges?

A. After adjusting curves to ensure that they are non-decreasing, the RLC software will automatically fill in gaps (if any) with RL from a higher output range then extends curves to the last bucket (as necessary).

Attachment D

-----Original Message-----
From: CRCommunications
Sent: Monday, June 23, 2003 5:02 PM
To: ISO Market Participants
Subject: CAISO Notice - Amendment 50 - Decremental Reference Price Level Information

MARKET NOTICE

June 23, 2003

Amendment 50 - Decremental Reference Price Level Information

ISO Market Participants:
Earlier today the CAISO held a conference call with Market Participants and Potomac Economics to discuss the Decremental (DEC) Reference Pricing Methodology. This methodology is scheduled to be implemented on July 1, 2003 HE01 per the May 30, 2003 FERC Order regarding Amendment 50. As a result of the conference call, Potomac Economics has drafted a white paper clarifying some points that were brought up in today's discussion. That document, entitled "Potomac Economics Plan for Calculating Decremental Reference Levels" is attached. Also included is the "Supplemental Reference Level Information" Request Sheet that Scheduling Coordinators may use to submit their updated unit information to Potomac Economics. These documents are also available on the CAISO website at <http://www1.caiso.com/clientserv/stakeholders/> under the "Amendment 50 Implementation" heading.

If you have questions regarding the DEC Reference Price Methodology or any of the material that has been provided please contact:

Michael Wander
Potomac Economics
(703) 383-0724 phone
(703) 383-0796 fax
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<<potomacplan.pdf>> <<blankform.doc>>

Client Relations Communications.0921

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POTOMAC
ECONOMICS

PLAN FOR CALCULATING DECREMENTAL REFERENCE LEVELS

Background

Currently, the AMP Reference Level Calculation (RLC) Software calculates the incremental Reference Levels (RLs) for Resources (generators, loads (e.g. pumped storage facilities), and intertie schedules) that bid into the California Independent System Operator's (CAISO) real-time supplemental energy market. The Software was developed in accordance with the CAISO tariff which states that incremental RLs are an input to CAISO's Automated Mitigation Procedure (AMP).

The AMP is not currently used for local market power. However, on May 30, 2003, the FERC ordered the CAISO to prevent the exercise of local market power associated with intra-zonal congestion by mitigating decremental bids. Rather than mitigating the bids to a proxy level proposed by the CAISO, FERC ordered that the bids be mitigated to a reference level. Hence, the CAISO must be provided with an additional set of RLs for decremental bids.

Proposal

The RL for a particular resource is an estimate of the marginal cost of producing additional output from that resource. There are principally 5 possible sources for RLs for resources that are applied in the following order of priority if available: (1) bid-based (from accepted in-merit incremental bids in past 90 days); 2) consultation-based (based on data submitted by market participant); 3) default-based (based on heat-rates and O&M costs submitted to ISO); 4) MCP-based (based on clearing prices at the resources location during hours and levels the resource was operating); 5) estimate-based (based on estimates by ISO or Potomac Economics).

It is possible that a competitively-priced incremental bid for a particular output segment of a supply resource may not be the same as a competitively-priced decremental bid for the same output segment. This is because the marginal cost of producing may not be the same as the avoided cost of not producing for all parts of all units. In addition, the incremental RL methodology employs a number of assumptions that ensure the RLs are not understated. To the extent these assumptions and procedures cause incremental RLs to be slightly overstated, they would not be appropriate for mitigating the decremental bids. Therefore, the RL formulation used for decremental bids should allow them to differ from incremental RLs when the marginal production costs of a unit differ from the avoided costs from not producing for a particular resource.

The methodology used to calculate decremental RLs will differ from the one used to calculate incremental RLs in several ways:

1. The bid-based RL information will be calculated from 90 days of accepted in-merit decremental bids rather than incremental bids. Units decremented for intra-zonal congestion would be excluded.[1]

2. Consultative values will be calculated separately for incremental and decremental RLs.

   - Consultative-based RL information that is applicable to incremental RLs may not be applicable to decremental RLs. Participants should have the opportunity to submit different cost information for each.

   - If participants do not submit cost information for decremental RLs that differs from information for incremental RLs, consultative decremental RLs will be equal to consultative incremental RLs multiplied by a 90 percent factor.

3. Default-based and MCP-based RLs will be calculated similarly for incremental and decremental RLs, although a 90 percent factor be applied for the decremental RLs.[2]

4. Non-increasing portions of decremental RLs will be *lowered* to ensure the entire RL range for a unit is monotonically increasing. The CAISO dispatch model requires that supplemental bids be monotonically increasing (i.e. flat or increasing for the entire range), so non-increasing portions of incremental RLs are raised until the entire range is monotonically increasing. This errs on the side of raising RLs to avoid unjustifiably mitigating units, however, this assumption may be harmful when applied to decremental RLs.

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1 Normally, only bids for output ranges that are actually produced are appropriate for determining reference prices. However, since a supplier if financially bound to purchase the decremented output from the CAISO imbalance market, the accepted decremental bid to *not* produce should be an accurate indicator of the resource's avoided costs and can appropriately be used to determine the decremental RL.

2 However, it is possible that Potomac Economics will apply methodologies for estimate-based RLs that are different for decremental RLs than incremental RLs.

Attachment E

CALIFORNIA ISO MARKET NOTICE

Requested Client Action: Mark Your Calendar, Request for Comment

Date of Distribution: May 2, 2007

Categories: Legal/ Regulatory, Settlements and Market Clearing

Subject: Bid-Based Reference Prices Calculation Issue Paper Posted

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Summary: The CAISO has posted a Bid-Based Reference Prices Calculation Issue Paper to its website for stakeholder comment. **Please submit comments to MRTUTariff@caiso.com by COB May 16, 2007.**

Main Text: The California ISO (CAISO) has posted a Bid-Based Reference Prices Calculation Issue Paper to its website for stakeholder comment. In addition, the CAISO has posted four reference material documents to the Current Initiatives/Calculation of Bid-Based Reference Prices page at: http://www.caiso.com/1bd2/1bd29e3f4f00.html. The CAISO intends to file an amendment to the CAISO Tariff with the Federal Energy Regulatory Commission to incorporate details specified in the Bid-Based Reference Prices Calculation Issue Paper.

The CAISO will hold a conference call on May 23, 2007 to discuss stakeholders' comments and questions on the issue paper.

Conference Call Information
Date: Wednesday, May 23, 2007
Time: 9:30 a.m. to 12:00 p.m. (PDT)
Dial-In Number: (888) 276-0010
Name of Call: Reference Price Calculation

Please submit comments to MRTUTariff@caiso.com by close of business Wednesday, May 16, 2007.

For More Information Contact: Ean O'Neill at eoneill@caiso.com or 916.608.7007

The California ISO strives to be a world-class electric transmission organization built around a globally recognized and inspired team providing cost-effective and reliable service, well-balanced energy market mechanisms, and high-quality information for the benefit of our customers.

EA/ComPR/IPS/ds

California ISO
Your Link to Power

California Independent
System Operator Corporation

California ISO

Proposal to Add Further Detail to Tariff Provisions Pertaining to the Calculation of Bid-Based Reference Prices in Currently Effective ISO Tariff

May 1, 2007

Prepared by: DMM/L&R
Version: May 1, 2007

CAISO Proposal to Add Further Detail to Tariff Provisions Pertaining to the Calculation of Bid-Based Reference Prices

I. INTRODUCTION

As provided in the ISO Tariff, the CAISO uses bid-based reference prices as part of its Automatic Mitigation Procedure ("AMP") and to settle bids dispatched out-of-sequence for Intra-Zonal Congestion. The bid-based reference prices are calculated for the CAISO by an independent entity, Potomac Economics ("Potomac"). The ISO Tariff specifies, at a fairly detailed level, how these reference prices are to be calculated. Other details were provided in documents drafted by Potomac and made publicly available by the CAISO through a market notice and a posting on the CAISO website. The CAISO intends to file an amendment to the ISO Tariff with the Federal Energy Regulatory Commission ("FERC") to incorporate details specified in those Potomac documents: the exclusion of non-positive bids from Potomac's calculations of both incremental bid reference prices and decremental bid reference prices.

II. BACKGROUND

The CAISO uses bid-based reference prices (also called bid-based reference levels) as part of its AMP and to settle bids dispatched out-of-sequence for Intra-Zonal Congestion. Pursuant to authority granted by FERC,[1] Potomac calculates the bid-based reference prices independently of the CAISO, pursuant to two similarly but not identically worded sections of the ISO Tariff: Section 27.1.1.6.1.1,[2] which is used to manage Intra-Zonal Congestion and specifies how decremental bid reference prices are calculated, and Section 3.1.1.1 of Attachment A to Appendix P ("Section 3.1.1.1"), which is used to impose market power mitigation measures under the AMP and specifies how incremental bid reference prices are calculated. Section 3.1.1.1 and Section 27.1.1.6.1.1 each contain a five-step process for determining bid-based reference prices. Only the first of these five steps is relevant to the issues addressed in this paper.

An incremental bid or a decremental bid can be either positive or non-positive. As relevant here, an incremental bid is an offer to increase output of a resource, so a non-positive incremental bid is an offer to increase output for no compensation, or, if the bid is negative, an offer to pay for increasing output. In practice, a resource owner submitting a non-positive incremental bid is not indicating its willingness to accept no compensation for its energy or to pay for the privilege of providing it. Rather, the resource owner is attempting to ensure that its resource's output is included in the CAISO's energy market and it receives the market clearing price established by other resources' positive incremental bids. A non-positive decremental bid is an offer to decrease

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[1] *See California Independent System Operator Corp.*, 101 FERC ¶ 61,061, at P 38 (2002); *California Independent System Operator Corp.*, 103 FERC ¶ 61,265, at PP 40-41, 54 (2003); *California Independent System Operator Corp.*, 107 FERC ¶ 61,042, at P 46 (2004).

[2] Section 27.1.1.6.1.1 was numbered as Section 7.2.6.1.1 in the old conformed ISO Tariff, and was assigned its current section number in the Simplified and Reorganized ISO Tariff that went into effect in 2006.

output for no compensation, or, if the bid is negative, an offer to reduce output if the resource is paid the bid amount.

Incremental Bid Reference Prices

Section 3.1.1.1 is used "[f]or purposes of establishing reference levels"[3] based on incremental bids. Section 3.1.1.1 states in relevant part that, under step one of the five-step process, "[a] reference level for each bid segment[4] shall be calculated" by "[e]xcluding proxy and mitigated bids" and shall be based on "the accepted bid, or the lower of the mean or median of a resource's accepted bids if such a resource has more than one accepted bid in competitive periods over the previous 90 days for peak and off-peak periods . . . ."[5]

Section 3.1.1.1 does not explicitly address whether non-positive (*i.e.*, negative or zero) incremental bids should be included in or excluded from the calculations of bid-based reference prices. Potomac has always excluded, and continues to exclude, all non-positive incremental bids from its calculations of bid-based reference prices under Section 3.1.1.1. Potomac's practice of excluding non-positive incremental bids was disclosed to Market Participants in a document containing "Frequently Asked Questions" that was posted on the ISO Home Page in December 2002 (the "FAQ").[6] The economic logic underlying the exclusion of non-positive incremental energy bids is that: (a) the bid reference prices are intended to serve as proxies for the marginal cost of a resource, based on the bids submitted by its owner during workably competitive periods; and (b) non-positive incremental energy bids do not typically reflect the resource's marginal cost, but instead signal the resource's willingness to be a "price-taker," *i.e.*, to accept whatever clearing price results in the CAISO market.

The CAISO understands that the New York ISO employs a practice of excluding non-positive incremental bids from its calculations of bid-based reference prices under its tariff, and that this detail is also not expressly stated in its tariff.[7]

Decremental Bid Reference Prices

Section 27.1.1.6.1.1 states in relevant part that, under step one of the five-step process, "[d]ecremental bid reference levels shall be determined by . . . [e]xcluding proxy bids, mitigated bids, and bids used out of merit order for managing Intra-Zonal Congestion" and shall be based on

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[3] Section 3.1.1.1(a).

[4] Under Section 3.1.1.1, for purposes of establishing reference prices, the capacity of each generation is divided into 10 equal energy bid segments between its minimum (Pmin) and maximum (Pmax) operating point. Section 3.1.1.1(a)(1).

[5] Section 3.1.1.1(a)(1).

[6] The FAQ is available at http://www.caiso.com/docs/2002/12/03/2002120315594923347.pdf. A copy of the FAQ is included in the attachments to this paper.

[7] *See* New York ISO Services Tariff, Attachment H, at Section 3.1.4 (containing the steps the New York ISO uses to determine reference prices).

"the accepted decremental bid, or the lower of the mean or the median of a resource's accepted decremental bids if such a resource has more than one accepted decremental bid in competitive periods over the previous 90 days for peak and off-peak periods . . . ."[8]

Section 27.1.1.6.1.1 also specifies a test that Potomac must use to determine when decremental bids have been accepted in "competitive periods":

> The test will require that the ratio of a unit's accepted out-of-sequence decremental bids (MWh) for the previous 90 days be less than 50 percent. If this ratio is greater [than] or equal to 50%, accepted decremental bids will be determined to have been accepted in non-competitive periods and cannot be used to determine the decremental reference price.[9]

Pursuant to FERC orders issued in the proceeding on Amendment No. 50 to the ISO Tariff ("Amendment No. 50"), the CAISO started using decremental bid reference prices in Intra-Zonal Congestion Management in 2003.[10] From then until July 21, 2006, Potomac excluded all non-positive decremental bids from its calculations of decremental bid reference prices under Section 27.1.1.6.1.1, though that section, like Section 3.1.1.1 dealing with incremental bid-based reference prices, does not explicitly address the treatment of non-positive decremental bids. In June 2003, Potomac prepared a memorandum (the "Potomac Memorandum") describing how decremental bid reference prices would be calculated and the CAISO circulated that memorandum by market notice issued on June 23, 2003.[11] The Potomac Memorandum indicated that Potomac would be calculating decremental bid reference prices in the same way that it calculated incremental bid reference prices, except for specifically identified differences. The Potomac Memorandum did not identify Potomac's practice with regard to the exclusion of non-positive bids as a difference between how Potomac would calculate decremental bid reference prices and how it was already calculating incremental bid reference prices (as disclosed in the FAQ). Therefore, it was implicit in the Potomac Memorandum that Potomac would be excluding non-positive decremental bids from its calculations of decremental bid reference prices, just as Potomac excluded non-positive incremental bids from its calculations of incremental bid reference prices.

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[8] Section 27.1.1.6.1.1(a)(1). Section 27.1.1.6.1.1 addresses how decremental bids may be used to determine reference prices for purposes of managing Intra-Zonal Congestion, but the section contains no mention of incremental bids. This is because the CAISO does not use reference prices based on incremental bids to manage Intra-Zonal Congestion, but instead performs Intra-Zonal Congestion Management by using available Imbalance Energy bids in real time and through other means specified in the ISO Tariff. *See* Section 27.1.1.6.2 of the ISO Tariff.

[9] Section 27.1.1.6.1.1(a)(1).

[10] *See California Independent System Operator Corp.*, 103 FERC ¶ 61,265, at PP 40-41, 54; *California Independent System Operator Corp.*, 107 FERC ¶ 61,042, at P 46.

[11] On June 23, 2003, the CAISO issued a market notice stating that the CAISO had held a conference call earlier that day with Market Participants and Potomac to discuss "the decremental reference pricing methodology" and that the methodology would be implemented on July 1, 2003. The market notice included as an attachment the Potomac Memorandum, dated June 23, 2003 and entitled "Plan for Calculating Decremental Reference Levels," which the market notice stated was provided to "clarify[ ] some points that were brought up in today's discussion." The market notice and the Potomac Memorandum are included as attachments to this paper.

Economic theory supports the exclusion of non-positive decremental bids from the calculation of decremental bid reference prices because: (a) the decremental bid reference prices are intended to serve as proxies for the avoided cost of a resource; and (b) non-positive decremental energy bids would rarely – if ever – reflect the resource's avoided cost.[12] Instead, non-positive decremental bids would typically signal the resource's unwillingness to have its output reduced for non-economic reasons (such as operational issues) and/or a generator's attempt to take advantage of uncompetitive market conditions, which might require the CAISO to instruct a generator to reduce its output at no cost or even to pay a generator to reduce its output. This latter possibility was, of course, the rationale for including in Amendment No. 50 a means to mitigate the exercise of market power through the submission of negative decremental bids (*i.e.*, the so-called "negative dec" game).[13]

Potomac changed its practice of excluding non-positive decremental bids from its calculations of decremental bid reference levels on July 21, 2006 following an inquiry from a single Market Participant that had erroneously submitted a high positive decremental bid (*i.e.*, a bid that exceeded the Market Participant's avoided costs), which had resulted in the establishment of a high (positive) decremental bid reference price. Potomac determined that inclusion of non-positive decremental bids in the calculation of the decremental bid reference price would have resulted in a lower decremental bid reference price because the erroneous high bid would have been offset, in part, by non-positive decremental bids. Because Potomac was not constrained by specific ISO Tariff language stating that non-positive decremental bids were required to be excluded, Potomac recalculated the decremental bid reference price and, ever since July 21, 2006, Potomac has included all non-positive bids in its decremental bid reference price calculations.

Except for the one Market Participant inquiry described above, the CAISO is not aware of any instance where a Market Participant had raised any concerns about how decremental (or incremental) references prices are calculated with respect to the treatment of non-positive bids.

III. CAISO PLAN FOR FILING AN ISO TARIFF AMENDMENT

The CAISO believes the exclusion of non-positive incremental bids to calculate incremental bid reference prices is authorized by the ISO Tariff, consistent with the economic logic discussed in Section II, above, and was disclosed to participants as being incorporated in the methodology to calculate incremental bid levels.. The CAISO also believes that both methods of calculating decremental bid reference prices—with and without including non-positive bids—are consistent with the ISO Tariff in that both methods are based on accepted bids. In addition, both methods result in the establishment of decremental bid reference prices that should not exceed avoided costs, provided the bids offered on behalf of a resource are not in excess of avoided costs. However, the CAISO believes that the bid-based reference prices for both incremental and decremental bids should be calculated consistent with the publicly disclosed information provided

[12] The Potomac Memorandum noted that "a competitively-priced incremental bid for a particular output segment of a supply resource may not be the same as a competitively-priced decremental bid for the same output segment. This is because the marginal cost of producing may not be the same as the avoided cost of not producing for all parts of all units." Potomac Memorandum at 3.

[13] *See California Independent System Operator Corp.*, 103 FERC ¶ 61,265, at P 3.

in the FAQ and the Potomac Memorandum. Accordingly, the CAISO has determined that the appropriate course of action is to file an ISO Tariff amendment to provide the detail that non-positive bids are excluded from the calculation of both incremental and decremental bid reference prices.

This conclusion is supported and informed by FERC's recent pronouncement in Order No. 890 that implementation details not included in the tariff must be publicly available and should not be changed without notice to affected Market Participants.[14] Moreover, the detail in question could, in a circumstance such as the one that prompted Potomac to start including non-positive bids in its calculation of decremental bid reference prices, substantially affect rates. If rates are substantially affected, the "rule of reason" employed by the courts and FERC suggests that the detail should be included in the ISO Tariff.[15]

The CAISO will not be seeking authorization from the Board of Governors as the proposed ISO Tariff amendment would contain implementation detail that relates to ISO Tariff provisions that were subject to stakeholder review and comment, and that were accepted by FERC, in the Amendment No. 50 proceeding. Accordingly, no new policy change requiring Board approval is under consideration. Finally, because both methods of calculating decremental bid reference prices (with and without including non-positive bids) are consistent with the ISO Tariff and both methods result in the establishment of decremental bid reference prices that should not exceed avoided costs, the CAISO is not proposing that decremental bid reference prices calculated since July 21, 2006 be recalculated.

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[14] *Preventing Undue Discrimination and Preference in Transmission Service,* Order No. 890, 72 Fed. Reg. 12266 (Mar. 15, 2007), FERC Stats. & Regs., Regs. Preambles ¶ 31,241, at PP 1649-1655 (2007).

[15] The rule of reason requires the filing, pursuant to Section 205 of the Federal Power Act, of all rates, charges, classifications, practices, and regulations that have a significant effect on FERC-jurisdictional rates or otherwise alter the terms of documents already on file with FERC, are "reasonably susceptible to specification," and are not "so generally understood in any contractual arrangement as to render recitation superfluous." *City of Cleveland v. FERC*, 773 F.2d 1368, 1376 (D.C. Cir. 1985).

Attachment F

From: Goldbeck, Glenn E (Energy Supply)
Sent: Wednesday, May 16, 2007 4:10 PM
To: MRTU Tariff
Cc: Tom, William; Chiara, John; Hitson, Brian; Witalis, Lawrence (Law); Coffee, Kevin; Andrews, Veronica; Yeung, Manho
Subject: PG&E Comments - Bid Based Reference Price Calculations

As requested by the CAISO, PG&E provides the following brief comments with respect to several CAISO Tariff revisions as outlined in the 'CAISO Proposal to Add Further Detail to Tariff Provisions Pertaining to the Calculation of Bid-Bases Reference Prices' issued 05/01/07.

Bid reference prices are used as part of the Automatic Bid Mitigation (AMP) process and to settle bids dispatched out-of-sequence for Intra-Zonal Congestion. As indicated in CASIO Tariff Section 3.1.1.1, Incremental bid reference prices are currently based on "the accepted bid, or the lower of the mean or median of a resource's accepted bids if such a resource has more than one accepted bid in competitive periods over the previous 90 days for peak and off-peak periods"; and similarly, decremental bid reference prices are based on "the accepted decremental bid, or the lower of the mean or median of a resource's accepted decremental bids if such a resource has more than one accepted bid in competitive periods over the previous 90 days for peak and off-peak periods". In both cases, the Tariff does not explicitly address whether non-positive bids should be included or excluded. In establishing the bid reference prices, Potomac Economics has consistently excluded non-positive bids for incremental reference prices, however Potomac has recently changed its practices with respect to determining decremental reference prices (and now currently *includes* non-positive bids). It is PG&E's understanding that this change was due to lack of specificity in the Tariffs and the lack of publicly available notice and information about the calculation methods for decremental reference prices (such notice and information did exist for incremental reference price determinations and Potomac continues to exclude non-positive bids from incremental reference price calculations).

The CAISO has indicated that it believes that the exclusion of non-positive bids to calculate both incremental and decremental bid reference prices is consistent with economic logic and is authorized in the current CAISO Tariffs; however the necessary implementation details and public disclosure of the calculations may be insufficient. Accordingly, the CAISO has determined that the appropriate course of action is to file an CAISO Tariff amendment to provide the detail that non-positive bids are excluded from the calculation of both incremental and decremental bid reference prices.

PG&E agrees that it is inappropriate to include non-positive bids in the determination of the bid reference prices (which are intended to reflect realistic proxy costs), and supports the CAISO proposal to clarify the calculations of the incremental and decremental bid reference prices (to exclude non-positive bids) and to put this specification into the CAISO Tariffs. However, the CAISO should clarify the process to determine reference prices in the unlikely but possible situation where all previously accepted bids (over the past 90 days) are non-positive.

Brian Hitson/Regulatory Relations
Glenn Goldbeck/Energy Procurement
PG&E

-----Original Message-----
From: Masooma.Tirmazi
Sent: Thursday, May 17, 2007 4:27 PM
To: MRTU Tariff
Cc: O'Neill, Ean
Subject: Fw: Comment on Bid Based Reference Price Calculation Paper

Hello Ean,

I have been asked by Jeff Nelson to forward this written comment to CAISO
White paper on Bid Based Reference Price Calculation.

Jeff

Nelson/SCE/EIX

To

05/15/2007 02:30 Masooma Tirmazi/SCE/EIX@SCE

PM

cc

Subject

Fw: Minor change in CAISO

reference level calculation

"SCE supports to the CAISO's proposal to exclude non-positive bids from

the
calculation of reference level bids for both INC and DEC bids."

Jeffrey Nelson, CFA
Manager of Market Design and Analysis
Southern California Edison

Williams Power Company, Inc. Comments on the
May 1, 2007 Proposal to Add Further Detail to Tariff Provisions
Pertaining to the Calculation of Bid-Based Reference Prices in Currently Effective ISO Tariff

Williams Power Company, Inc. ("Williams") appreciates this opportunity to submit these comments.

As Williams understands, the CAISO is proposing to develop and file tariff language to make clear that the CAISO will be excluding all non-positive bids from the calculation of incremental and decremental reference prices used in the CAISO's current market power mitigation schemes, despite the fact that Potomac Economics, the independent entity which calculates those reference prices for the CAISO, has been including all non-positive accepted bids in its decremental reference price calculations since July 21, 2006.

Several aspects of this proposal concern Williams:

First, that the CAISO Tariff lacks detail relevant to the determination of the rates paid to suppliers when their reference prices are used. As the CAISO recognizes and now proposes to address, such detail must be included in the CAISO Tariff even if that detail may be present in other publicly available materials. This issue further emphasizes the need for the CAISO to ensure that all relevant details are in the CAISO Tariff and not only in a Business Practice Manual.

Second, that the CAISO will not be seeking authorization from its Board of Governors prior to filing this tariff amendment. Section 15 of the CAISO Tariff provides: "Any amendment or other modification of any provision of this ISO Tariff must be in writing and approved by the ISO Governing Board in accordance with the bylaws of the ISO." The CAISO's proposed amendment may not rise to the level of a "policy" decision, but as an amendment to the CAISO Tariff it clearly falls within the requirements of Section 15 and warrants Board approval.

Attachment G

From: CAISO Communications [CAISOCommunications@caiso.com]
Sent: Thursday, May 31, 2007 1:38 PM
Subject: Bid-Based Reference Price Draft Tariff Language Posted

CALIFORNIA ISO MARKET NOTICE

Requested Client Action: Request for Comment

Date of Distribution: May 31, 2007

Categories: Legal/ Regulatory, Market Rules and Market Design

Subject: Bid-Based Reference Price Draft Tariff Language Posted

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Main Text: The California ISO has posted for stakeholder comment the Bid-Based Reference Price draft tariff language to its Current Initiatives/Calculation of Bid-Based Reference Prices webpage at http://www.caiso.com/1bd2/1bd29e3f4f00.html. **Please submit comments to eoneill@caiso.com by close of business Thursday, June 7, 2007.**

No conference call is planned at this time due to the limited nature of the proposed change.

For More Information Contact: Ean O'Neill at eoneill@caiso.com or 916.608.7007

California ISO
Your Link to Power

The California ISO strives to be a world-class electric transmission organization built around a globally recognized and inspired team providing cost-effective and reliable service, well-balanced energy market mechanisms, and high-quality information for the benefit of our customers.

EA/ComPR/IPS/ds

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon all of the parties listed in the attached filing as receiving service, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 14th day of June, 2007.

Sidney M. Davies BAM

Sidney M. Davies