

January 30, 2014

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. ER14-\_\_\_\_-000**

**Amendment to Revise Price Correction Procedures**

Dear Secretary Bose:

The California Independent System Operator Corporation (“ISO”) respectfully submits this filing to amend the ISO tariff to improve the accuracy and certainty of ISO market prices.<sup>1</sup>

In order better to balance the competing interests of price certainty and price accuracy, the ISO proposes to change the current five-calendar-day limitation on price corrections to three *business* days after the applicable day-ahead market and five *business* days after the applicable real-time market. In addition, the ISO proposes to provide greater detail in its tariff regarding (1) the types of price correction processing and publication issues that the ISO may rectify after the proposed price correction deadline and (2) the communications to the market concerning price corrections. Finally, the ISO proposes to adjust the closing time for inter-scheduling coordinator trades to allow more time for processing the day-ahead market results.

The ISO asks that the Commission accept the proposed amendments as filed because they enhance the ISO’s price corrections processes and provide market participants with greater transparency over these matters. The ISO requests that the Commission make the tariff revisions effective on the April 1, 2014 trading day.

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<sup>1</sup> The ISO submits this filing pursuant to section 205 of the Federal Power Act, 16 U.S.C. § 824d (2012) and Rule 205 of the Commission’s Rules of Practice and Procedure, 18 U.S.C. § 385.205 (2013).

## I. Background

Through its price correction process, set forth in section 35 of the ISO Tariff, the ISO corrects invalid prices in accordance with a specified set of criteria by either recalculating prices or selecting replacement prices from similar market intervals. The purpose of the price correction process is to ensure the use of appropriate and accurate inputs in settlements as well as to ensure that prices accurately reflect system conditions. Under the current ISO tariff provisions, prices can be corrected due to (1) a data input error, (2) a hardware or software failure, or (3) an inconsistency between the price and that required by the tariff. The ISO attempts to develop corrected prices that are as close as possible to the prices that would have resulted under the tariff, had the circumstances that necessitated the correction not occurred.

At the start of its new market design in 2009, the ISO instituted an eight-calendar day time limit for price corrections.<sup>2</sup> Subsequently, in 2010, the ISO conducted a stakeholder process to review price correction procedures. As a result, the ISO revised the tariff to reduce the time limit for price correction to five calendar days, with certain exceptions to accommodate circumstances in which the ISO discovered the error within five days, but was unable to process and publish the correction within that period.<sup>3</sup>

During 2012, the number and frequency of price corrections in the day-ahead market increased significantly. To address this, the ISO implemented a process, within its existing tariff authority, to anticipate needed price corrections. Under current procedures, the ISO performs a trial run of the day-ahead market two days in advance of the actual run. The ISO refers to this as the DA+2 pre-market run. Each day, the ISO conducts this DA+2 pre-market run immediately after completion of the actual run for the next trading day. The ISO uses the same hardware and software as for the actual run, using the most recent information available for outages and transmission constraints, and using a set of historical market bids. When the DA+2 pre-market run identifies a data or software issue, the ISO uses the window between the time the DA+2 is completed and the next morning actual run to address the issue. In addition, the ISO validates the actual market run of the day-ahead market while it is running and when issues are found, the ISO has a small window between the time the issue is identified and the publication of prices to resolve the issue and, if feasible, rerun the day-ahead market with the correct information before issuing the market results.

In recent months the ISO has found that this validation of the day-ahead market has served to identify and correct the majority of issues related to either

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<sup>2</sup> See *Cal. Indep. Sys. Operator Corp.*, 126 FERC ¶ 61,082 at P 48.-54 (2009).

<sup>3</sup> See *Cal. Indep. Sys. Operator Corp.*, 132 FERC ¶ 61,269 at PP 8-9, 16 (2010)

software or data that require corrections before conducting the actual financially binding day-ahead market run. In some instances, however, the ISO has been unable to identify the precise cause of the issue and correct the underlying problem by the target time of 1300 hours, in which cases the ISO has needed to publish day-ahead market results despite the identified issue. For example, this has happened when there has been a market functionality issue for which the ISO cannot provide a temporary fix while running the market. In such instances, a software patch may be required from the software vendor, which could only arrive after publication. In addition to this effort, the ISO has been working on a root cause analysis for price correction events in order to resolve the underlying issues leading to price corrections, which has contributed to the need for price corrections in all markets.

Having accumulated three years of experience with the current price correction structure, the ISO concluded it should again review the price correction rules and requirements and, if appropriate, streamline and clarify the scope, reasons, and time limits for price corrections. Therefore, on May 23, 2013, the ISO published an issue paper<sup>4</sup> and initiated a stakeholder process to review the price correction rules and requirements.

## **II. Stakeholder and Board Consideration**

Following the posting of the issue paper, the ISO conducted a web conference for stakeholders on May 30, 2013, and solicited comments. After reviewing comments, the ISO posted a straw proposal on June 21, 2013,<sup>5</sup> and conducted a second web conference on June 27, 2013. The ISO posted the draft final proposal on July 16, 2013,<sup>6</sup> followed by a web conference on July 22, 2013. The ISO posted the revised draft final proposal on August 8, 2013.<sup>7</sup> A matrix of the stakeholder comments is included as Attachment C.

ISO Management presented the proposal to the ISO Board of Governors on September 12, 2013. The memorandum to the board is included as Attachment D. The Board unanimously approved the proposal.

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<sup>4</sup> The issue paper is available at <http://www.caiso.com/Documents/IssuePaper-RevisionsPriceCorrectionRequirements.pdf>.

<sup>5</sup> The straw proposal is available at <http://www.caiso.com/Documents/StrawProposal-RevisionPriceCorrectionRequirements.pdf>.

<sup>6</sup> The draft final proposal is available at <http://www.caiso.com/Documents/DraftFinalProposal-RevisionsPriceCorrectionRequirements.pdf>.

<sup>7</sup> The revised draft final proposal is available at <http://www.caiso.com/Documents/RevisedDraftFinalProposal-RevisionsPriceCorrectionRequirements.pdf>.

The ISO posted draft tariff language on December 18, 2013 and received comments from stakeholders on the proposed tariff language on January 8, 2014. The ISO conducted a telephone conference call on January 9, 2014 and posted responses to the submitted comments on January 28, 2014.<sup>8</sup> Stakeholders were generally supportive of the proposed changes and tariff, except for one group of stakeholders who expressed concerns regarding the additional detail the ISO proposes to add to the tariff regarding processing and publication issues as discussed further below.

### **III. Proposed Tariff Revisions**

#### **A. Modifications to price correction time horizon to better ensure posting of accurate prices within a timely manner**

ISO Tariff section 35.2 establishes the timing of the ISO's price correction process. The ISO proposes to revise section 35.2 to provide that the price correction process for day-ahead market prices will terminate no later than the end of the third business day following the trading day. For the real-time market, the price correction process for each trading day will terminate no later than the end of the fifth business day following that trading day. The ISO will not make price corrections outside that time other than pursuant to a Commission order or to remedy a processing and publication error, as set forth in section 35.3.<sup>9</sup> Stakeholders uniformly supported this proposed change.

The proposal to change the time limit for price corrections for the day-ahead market from five calendar days to three business days provides the market with greater price certainty regarding day-ahead prices. As described above, prior to proposing this amendment, the ISO enhanced day-ahead procedures to enable it to evaluate day-ahead market inputs prior to conducting the final binding day-ahead market run. The enhanced procedures have reduced day-ahead market price corrections in 2013 by 60 percent from the previous year. As a result, the modification of the timeframe for price correction for the day-ahead market should not compromise the production of accurate prices.

In the real-time market, which runs every five minutes, there is insufficient time to verify the accuracy of data inputs prior to the binding run. Therefore, the ISO does not propose to shorten the time limit for price corrections for real-time market prices. The current five calendar-day limit, however, does present certain issues. On those occasions when the fifth calendar day falls on a weekend or

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<sup>8</sup> The draft tariff is available at <http://www.caiso.com/Documents/DraftTariffLanguage-Revision-PriceCorrectionRequirements.doc>. Stakeholder comments are available at <http://www.caiso.com/Documents/Revisions%20to%20price%20correction%20requirements%20-%20tariff/Stakeholder%20comments/Comments%20on%20draft%20tariff%20language>.

<sup>9</sup> The ISO is proposing other revisions to section 35.2 for clarification. These do not substantively modify the timing requirements.

holiday, the use of calendar days instead of business days effectively reduces the time window that is necessary for sound validation and processing of price corrections. It is also during these times that the ISO is most likely to find processing issues as normal business units may not be fully manned outside office hours. The ISO is therefore proposing to modify the current five-calendar-day limit for real-time price corrections to five *business* days. This modification provides greater assurances of accurate posted prices. Stakeholders did not object to the modification.

The proposed tariff changes do not in any way expand the ISO's authority to conduct price validation and corrections beyond the price correction time limitations. Nonetheless, certain stakeholders requested that the ISO state clearly in its tariff that it will not conduct price corrections beyond the time prescribed in Section 35.2. The ISO is therefore proposing language specifying that the ISO will validate prices, conduct the price corrections, and post prices as corrected within that time period. The language, however, reflects current practices in which the ISO's price validation and implementation of the price corrections is all conducted within the five calendar days as specified in the currently effective Section 35.2. Once published after the third business day for the day-ahead market and after the fifth business day for the real-time market, the prices will be final and the ISO will settle the market based on those corrected prices.

#### **B. Adding details regarding scope of authority for processing and publication issues.**

The ISO tariff currently identifies limited circumstances under which the ISO may modify the posted prices after that price correction deadline. Section 35.3 provides that the ISO may change posted prices either pursuant to a Commission order or in order to remedy a processing and publication error.<sup>10</sup>

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<sup>10</sup> Specifically, the current section provides:

##### **35.3 Finality Of Prices Subject To The Price Correction Process**

All prices shall be considered provisional until the CAISO has completed the price correction process regarding them. All prices for each Trading Day shall be considered final for purposes of this Section 35 once the price correction process for that Trading Day has ended and the CAISO will not make price corrections or change published prices after the price correction process time period has expired except as further discussed in this Section 35.3. The CAISO will not make price corrections after the price correction process time period specified in Section 35.2 has expired, except as otherwise directed by the Federal Energy Regulatory Commission. *In addition, for intervals in which the CAISO experiences a problem with the processing or publication of prices, the CAISO will make changes to the affected prices to remedy the processing or publication problems within the time period following the applicable Trading Day as specified in the Business Practice Manual, except as otherwise directed by the Federal Energy Regulatory Commission.* After the expiration of the applicable time horizon for addressing processing and publication issues, as specified in the Business Practice Manual, in the

The Commission approved this provision as just and reasonable because it gave the ISO “a reasonable amount of time to rectify the publication of prices that were properly corrected during the five-day time frame, while also providing greater price certainty to market participants by establishing a definitive end-date for the correction process.”<sup>11</sup>

The ISO has developed internal procedures for validating and implementing price corrections within the time frame specified in Section 35.2. However, on occasion, the ISO has experienced certain difficulties that either result in the posting of an erroneous price that the ISO had correctly validated and corrected prior to its publication or the posting of an uncorrected price that the ISO had identified as eligible for correction. These issues arise when (1) because of the failure of a specific automated system or human error, the ISO is unable to publish the corrected price or (2) due to the complexity of the price correction methodology or the breadth of impact of the price correction, the ISO is unable to process the price correction within the price correction time limit. Consistent with the Commission’s order, the ISO included details in its business practice manuals that specify the time frame in which the ISO may rectify these issues.<sup>12</sup>

The ISO has been operating consistent with these requirements since 2010. Shortly after the ISO adopted its new market, it determined that there was a need for such flexibility to avoid leaving uncorrected ISO’s OASIS prices that

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case of a price discrepancy between prices posted on the CAISO’s OASIS and prices provided to Scheduling Coordinators through other means, the CAISO will use the price posted on OASIS for Settlement purposes.

(Emphasis added.)

<sup>11</sup> *Cal. Indep. Sys. Operator Corp.*, 132 FERC ¶ 61,269 at P 25 (2010).

<sup>12</sup> Specifically, the Business Practice Manual for Market Operations states, in relevant part:

**8.1.6.2 Price Correction Time Horizon**

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- The Price Correction Time Horizon is five calendar days, meaning that the Price Correction Time Horizon shall begin at the time of publication of market prices to OASIS for the Trading Day, and shall end at 23:59 on the fifth calendar day following that Trading Day.

In the event that the CAISO experiences a processing or publication issue which renders the prices posted on OASIS or CMRI inconsistent with any price that was subject to a price correction, the ISO shall endeavor to correct such publication as soon as practicable. Twenty business days after the applicable Trading Day, the CAISO will not correct such processing or publication errors except as otherwise directed by the Federal Energy Regulatory Commission. After twenty business days, if there is still a discrepancy between the published prices on OASIS or CMRI and the prices used for settlements, in the event of a valid settlement dispute the CAISO will adjust the settlement prices to reflect the prices posted on OASIS for the applicable intervals.

were otherwise designated to be corrected, and settling on those uncorrected prices. In cases where a system failed to publish a price, the OASIS might indicate a null price, which if left as is after the fifth day, the ISO could not settle because the tariff specified that prices are final as posted on the fifth day. The ISO determined it was appropriate to fix these technical and processing issues to avoid market outcomes that are inconsistent with the outcome of the market as it actually cleared. The ISO therefore adopted this provision to allow it to implement price corrections that the ISO identified, and in some cases implemented, within the time period for price corrections but, for a variety of reasons, failed to post on OASIS within that time.

Over the past couple of years, the ISO has succeeded at minimizing the need to modify posted prices after the fifth calendar day. In 2012, the ISO needed to implement price corrections after the deadline on 21 days. In 2013, this occurred on only one day.

In late 2012 and 2013, a number of issues arose that triggered market participant concerns regarding the ISO's implementation of this authority. The ISO concluded, however, that it is important that it continues to have this authority to avoid the need to seek Commission permission to fix technical and processing issues. During the stakeholder process preceding this filing, the ISO discussed with stakeholders the need to retain this authority and determined that the overwhelming majority agreed that the ISO should do so; only a group of marketers did not agree. Significantly, this provision allowing the ISO to remedy a processing and publication error does not provide the ISO with authority to conduct price validation and trigger price corrections outside the price correction deadline.

The ISO nonetheless concluded the market participant concerns demonstrated a need for greater clarity and transparency regarding the ISO's authority to address problems with posted prices under this section and its exercise of that authority. Accordingly, to allay these concerns, the ISO proposes (1) to reorganize and enhance the detail of Section 35.3 to state more clearly the circumstances under which the ISO may correct prices outside the time periods specified in section 35.2 and (2) to include specific requirements that the ISO communicate the need for such measures to market participants in a timely manner.

Proposed new section 35.3.1 would continue the current authority to make price corrections or modifications of published prices upon order of the Commission. Proposed new section 35.3.2 authorizes price correction outside the timelines in section 35.2 if needed to remedy price correction processing or publication issues. The ISO is moving certain business practice manual provisions that govern this type of price correction to the tariff, including the provision that the ISO may make such corrections within twenty business days of the trading day. The proposed new tariff provisions also specify four types of

issues that may justify a price correction under section 35.3.2: (1) volumetric processing issues; (2) hardware and software issues; (3) business process issues; and (4) complex manual processes.

While a small segment of the stakeholder community continues to oppose the ISO's need for such provisions, the ISO submits that it is just and reasonable to allow the ISO to retain this authority. The types of issues the ISO fixes under this authority are those that one can expect in the normal course of business, and the provision enables the ISO to readily rectify such issues with minimal disruption to its market participants operations. The authority may be particularly important as the ISO implements significant changes into its market to adopt fifteen-minute scheduling<sup>13</sup> and an expansion of the real-time market to include additional balancing authority areas.<sup>14</sup>

The Commission has approved similar provisions for the MidContinent Independent System Operator as reflected in its tariff section 40.2.18. The MidContinent ISO's tariff states that prices will be finalized and posted as soon as practicable following the operating day and in accordance with the timeframes specified in the business practices manuals, except that the finalization and posting of such prices shall not exceed five business days, and that any posting of final prices exceeding five business days shall require approval by the MidContinent ISO's board of governors.<sup>15</sup> While MidContinent's authority requires board action to effectuate changes beyond the price correction time horizon, the tariff does not specify the types of changes that can occur and appears to be broader than the ISO's authority in current section 35.3. In light of the narrow scope of the ISO's authority, requiring Board approval would be unnecessary and counter-productive. Only processing and publication issues can be remedied beyond that time period for price corrections, and the ISO must address those within twenty days. Requiring Board or Commission authority to fix these technical issues would unnecessarily delay fixing these issues and would require that the market remain unsettled or settled based on erroneous prices while the board or Commission process unfolds. Consistent with the overwhelming stakeholder support to retain this authority, the ISO asks that the Commission approve the addition of these details in the ISO tariff.

### **C. Weekly price correction reports**

The ISO proposes to clarify section 35.6, regarding weekly price correction reports, to specify that it refers to a calendar week. The proposed revision also specifies that if the ISO fails to post the weekly report, the ISO will

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<sup>13</sup> See Docket No. ER14-480.

<sup>14</sup> See *Cal. Indep. Sys. Operator Corp.*, 143 FERC ¶ 61,298 (2013).

<sup>15</sup> See *Midcontinent Independent System Operator, Inc.*, FERC Electric Tariff, as filed 11/18/2013, Section 40.2.18, Price Verification.



endeavor to post the report within six months of the affected calendar week, but if it is unable to do so the report will not be required, as after that date it loses its efficacy.

These clarifications are necessary in light of the ISO's proposed revisions that provide different time frames for the day-ahead market and real-time market price corrections. These changes enable the ISO to report on price corrections within a two week time frame. This is consistent with the ISO's current practice. The proposed amendment only provides clarity on when participants should expect to have certain price corrections appear in which report.

The following table provides an example of the timing of the weekly price correction for the first few weeks of April 2014 under the proposal:

Date	Day	T+5C	IFM Trade Dates (T+3B)	RT Trade Dates (T+5B)	Price Correction Report Calendar Week Period
31-Mar-14	Monday	3/26/2014			
01-Apr-14	Tuesday	3/27/2014			
02-Apr-14	Wednesday	3/28/2014			
03-Apr-14	Thursday	3/29/2014			
04-Apr-14	Friday	3/30/2014	4/1/2014		
05-Apr-14	Saturday	3/31/2014			
06-Apr-14	Sunday				
07-Apr-14	Monday		4/2/2014		
08-Apr-14	Tuesday		4/3/2014	4/1/2014	
09-Apr-14	Wednesday		4/4 - 4/6/2014	4/2/2014	
10-Apr-14	Thursday		4/7/2014	4/3/2014	
11-Apr-14	Friday		4/8/2014	4/4 - 4/6/2014	
12-Apr-14	Saturday				
13-Apr-14	Sunday				3/31 - 4/6/2014
14-Apr-14	Monday		4/9/2014	4/7/2014	
15-Apr-14	Tuesday		4/10/2014	4/8/2014	
16-Apr-14	Wednesday		4/11 - 4/13/2014	4/9/2014	
17-Apr-14	Thursday		4/14/2014	4/10/2014	
18-Apr-14	Friday		4/15/2014	4/11 - 4/13/2014	
19-Apr-14	Saturday				
20-Apr-14	Sunday				4/7 - 4/13/2014
21-Apr-14	Monday		04/16/2014	4/14/2014	
22-Apr-14	Tuesday		04/17/2014	4/15/2014	

23-Apr-14	Wednesday		04/18-04/20/2014	4/16/2014	
24-Apr-14	Thursday		04/21/2014	4/17/2014	
25-Apr-14	Friday		04/22/2014	4/18-4/20/2014	
26-Apr-14	Saturday				
27-Apr-14	Sunday				4/14 - 4/20/2014

The ISO also proposes to add a requirement that if it fails to provide a report at any given time, the ISO will post the report within six months after its initially due to be posted. If the ISO is not able to post the report within six months for whatever reason, the ISO will no longer be required to do so. This is a provision that is appropriate for publications, such as this, that provide additional details but do not directly impact the outcome of a market participant's settlement. These reports are provided to explain the reasons for the price corrections, but participants are made aware of price corrections themselves as soon as they occur because they observe the price changes. This report supplements that information already available to the market. After six months that information is no longer relevant and there is no reason to impose a requirement that ISO continue to attempt to provide that report.

**D. Revisions to the trading period for inter-scheduling coordinator trades**

During the stakeholder process that preceded this filing, the ISO considered whether it should change the time at which it posts the day-ahead market results to provide it more time to verify the inputs into the day-ahead market and resolve data or software issues that may impact the day-ahead prices before clearing the market and posting day-ahead prices. Currently, the ISO tariff requires that the ISO post day-ahead prices by 1300 hours Pacific Time.<sup>16</sup> The ISO concluded that there was no need to change this timeline given the infrequency with which there would be a delay for the day-ahead market results. However, to accommodate the need for more validation and without compromising the publication target of the day-ahead market, the ISO proposes to modify the closing time for when inter-scheduling coordinator trades<sup>17</sup> can be submitted from 1200 hours to 1100 hours pacific time of the day-ahead. There are several instances where the day-head market is complete and ready for

<sup>16</sup> See CAISO Tariff Section 6.5.3.2.2 and 31.6.

<sup>17</sup> Inter-scheduling coordinator trades are instruments offered to market participants for use in settlement contract related requirements under the ISO tariff rules. These can take the form of trades for Energy, Ancillary Services, or load uplift obligations for bid cost recovery in the integrated forward market. See CAISO Tariff Section 28.

publication before 1200 hours. With the current requirements, the day-ahead market cannot be published before 1200 hours because the closing time for the inter-scheduling coordinator trades is at 1200 hours. This new closing time will still provide a time window for participants to revisit their inter-SC trade bids after the day-ahead market closes at 1000 hours and will eliminate the current barrier for the ISO to be able publish results before 1200 hours if those results are ready.

No stakeholder opposed this change.

#### **IV. Effective Date and Request for Waivers**

The ISO respectfully requests that the tariff revision to section 35.3 become effective on the February 10, 2014 Trading Day and that all other changes contained in this filing become effective on the April 1, 2014 trading day.

#### **V. Communications**

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

Nancy Saracino  
General Counsel  
Roger E. Collanton  
Deputy General Counsel  
\*Anna McKenna  
Assistant General Counsel  
California Independent System  
Operator Corporation  
250 Outcropping Way  
Folsom, CA 95630  
Tel: (916) 351-4400  
Fax: (916) 608-7296

\*Michael E. Ward  
Alston & Bird LLP  
The Atlantic Building  
950 F Street, NW  
Washington, DC 20004  
Tel: (202) 239-3300  
Fax: (202) 654-4875

\* Individuals designated for service pursuant to Rule 203(b)(3), 18 C.F.R. § 385.203(b)(3) (2012).

#### **VI. Service**

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

## **VII. Attachments**

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

- A. Clean version of the proposed tariff amendments.
- B. Blacklined version of the proposed tariff amendments.
- C. Matrix of stakeholder comments provided to the ISO Board of Governors.
- D. Memorandum to the ISO Board of Governors.

## **VIII. Conclusion**

For the reasons stated above, the ISO respectfully requests that the Commission approve these tariff amendments, effective as of the dates described herein.

Respectfully submitted,

**/s/ Anna A. McKenna**

Michael E. Ward  
Alston & Bird LLP  
The Atlantic Building  
950 F Street, NW  
Washington, DC 20004  
Tel: (202) 239-3300  
Fax: (202) 654-4875

Nancy Saracino  
General Counsel  
Roger Collanton  
Deputy General Counsel  
Anna A. McKenna  
Assistant General Counsel  
California Independent System  
Operator Corporation  
250 Outcropping Way  
Folsom, CA 95630  
Tel: (916) 351-4400  
Fax: (916) 608-7296

*Counsel for the California Independent System Operator Corporation*

**Attachment A – Clean Tariff Sheets**

**Revisions to Price Correction Procedures**

**California Independent System Operator Corporation**

**January 30, 2014**

### **35.2 Timing Of The Price Correction Process**

All prices for each Trading Day shall become subject to the CAISO's price correction process once the CAISO publishes them on its OASIS or provides them directly to Market Participants, if applicable. The price correction process consists of the process in which the CAISO verifies, determines the corrections it will make, conducts the correction, and posts the corrected process. For Day-Ahead Market prices, the price correction process for each Trading Day shall end no later than the end of the third Business Day following the Trading Day to which the Day-Ahead Market applies. For the Real-Time Market prices, the price correction process for each Trading Day shall end no later than the end of the fifth Business Day following that Trading Day. After these timelines have elapsed, the posted prices are final and used for Settlement purposes unless the CAISO must modify published prices for the reasons specified in Section 35.3. The CAISO shall provide notification on the CAISO Website or its OASIS, when it has reasonable grounds to believe that it may have to change published prices for reasons stated in Section 35.3.

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### **35.3 Finality Of Prices Subject To The Price Correction Process**

All prices are provisional until the CAISO has completed the price correction process for each CAISO Market within the timeframe specified in Section 35.2. After the timelines specified in Section 35.2, the CAISO will not modify published prices except for the reasons specified in this Section 35.3.

\* \* \*

#### **35.3.1 Price Corrections and Changes Pursuant to FERC Orders**

The CAISO will correct prices and further modify published prices after the timelines specified in Section 35.2, if so directed by the Federal Energy Regulatory Commission.

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#### **35.3.2 Processing and Publication Issues**

The CAISO may make changes to published prices after the expiration of the timelines specified in Section 35.2 to remedy a price correction processing or publication issue, which consist of the types of issues further defined in this Section 35.3.2. The CAISO shall make any such changes within twenty (20) Business Days of the affected Trading Day. After the expiration of the applicable twenty (20) Business Days, in the event of a discrepancy between prices posted on the CAISO's OASIS and prices provided to

Scheduling Coordinators through other means, the CAISO will use the price posted on OASIS for Settlement purposes unless as specified in Section 35.3.1. The CAISO will only remedy processing and publication pursuant to this section for cases in which the CAISO has actually identified and logged in its systems the need for a price correction for specific CAISO Markets intervals within the timeframe specified in Section 35.2, but cannot complete the price correction and post the corrected prices within that timeframe for the specific reasons described below. To the extent the CAISO is aware of a processing or publication issue prior to the expiration of the timeframe specified in 35.2, the CAISO will issue a public notification of the affected intervals, and the time at which it expects to remedy the issue, as soon as practicable. To the extent the CAISO only becomes aware of the issue after the expiration of the timeframe specified in Section 35.2, the CAISO will issue a public notification with this same information, as soon as practicable. For purposes of the requirements in this Section 35.3, processing or publication issues shall consist of:

- a) Volumetric processing issue: The CAISO cannot complete the corrections and post the corrected prices within the timeframes specified in Section 35.2 because the price correction affects a large number of market intervals.
- b) Hardware or software issues: A software or hardware issue that impeded the CAISO from processing price corrections or publishing the corrected prices by the end of the timeframes specified in Section 35.2.
- c) Business process issues: A limitation, failure or error in implementing an established and identifiable business process that causes the publication of an incorrect price that is either corrected erroneously, or left uncorrected within the timeframes specified in Section 35.2.
- d) Complex manual corrections: The CAISO has identified and logged into its systems within the timeframe specified in Section 35.2 the need for price corrections that require specifically tailored methodologies to implement the correction because of the complexity of the issue, which in some cases may span across the CAISO Markets, and implementing this price corrections will require the publication of corrected prices beyond the timeframe specified in Section 35.2.

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### **35.6 Weekly Price Correction Report**

The CAISO shall summarize all price corrections that occur within a calendar week in a report that shall be posted on the CAISO Website by the seventh calendar day of the following calendar week. For all price corrections that occur during the calendar week covered by the weekly report, the price correction report shall specify: (a) the market intervals affected, (b) the price locations affected, (c) a brief description of the reason for the price correction, and (d) the method of price corrective action undertaken. In the event the CAISO fails to post this report, the CAISO will endeavor to post the report within six months of the affected calendar week, after which the failed report will no longer be issued.

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### **Appendix A**

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#### **- Day-Ahead Inter-SC Trade Period**

The period commencing seven (7) days prior to the applicable Trading Day and ending at 11:00 Hours Pacific Time on the day prior to that Trading Day, during which time the CAISO will accept Inter-SC Trades of Energy for the DAM from Scheduling Coordinators.



**Attachment B – Marked Tariff Sheets**

**Revisions to Price Correction Procedures**

**California Independent System Operator Corporation**

**January 30, 2014**

### 35.2 Timing Of The Price Correction Process

All prices for each Trading Day shall become subject to the CAISO's price correction process once the CAISO publishes them on its OASIS or provides them directly to Market Participants, if applicable. ~~The price correction process consists of the process in which the CAISO verifies, determines the corrections it will make, conducts the correction, and posts the corrected process.~~ For ~~a~~ Day-Ahead Market prices, the price correction process for each Trading Day shall end no later than the end of the third Business Day following the Trading Day to which the Day-Ahead Market applies. For the Real-Time Market prices, the price correction process for each Trading Day shall end no later than the end of the fifth ~~calendar~~ day Business Day following that Trading Day. ~~The CAISO may complete~~ After these timelines have elapsed, the ~~price correction process posted prices are final and used for any Trading Day earlier than Settlement purposes unless the end time established in this CAISO must modify published prices for the reasons specified in~~ Section 35-.3. The CAISO shall provide notification on the CAISO Website or its OASIS, when it has ~~completed the price correction process for each Trading Day.~~ If the CAISO does not provide such notification, the ~~price correction process will be deemed complete at the end of the fifth calendar day following~~ reasonable grounds to believe that ~~Trading Day~~ it may have to change published prices for reasons stated in Section 35.3.

\* \* \*

### 35.3 Finality Of Prices Subject To The Price Correction Process

~~All prices shall be considered provisional until the CAISO has completed the price correction process regarding them. All prices for each Trading Day shall be considered final for purposes of this Section 35 once the price correction process for that Trading Day has ended and the CAISO will not make price corrections or change published prices after the price correction process time period has expired except as further discussed in this Section 35.3. The CAISO will not make price corrections after the price correction process time period specified in Section 35.2 has expired, except as otherwise directed by the Federal Energy Regulatory Commission. In addition, for intervals in which the CAISO experiences a problem with the processing or publication of prices, the CAISO will make changes to the affected prices to remedy the processing or publication problems within the time period following the applicable Trading Day as specified in the Business Practice Manual, except as otherwise directed by the Federal Energy~~

~~Regulatory Commission. After the expiration of the applicable time horizon for addressing processing and publication issues, as specified in the Business Practice Manual, in the case of a price discrepancy between prices posted on the CAISO's OASIS and prices provided to Scheduling Coordinators through other means, the CAISO will use the price posted on OASIS for Settlement purposes. All prices are provisional until the CAISO has completed the price correction process for each CAISO Market within the timeframe specified in Section 35.2. After the timelines specified in Section 35.2, the CAISO will not modify published prices except for the reasons specified in this Section 35.3.~~

~~\* \* \*~~

### **35.3.1 Price Corrections and Changes Pursuant to FERC Orders**

~~The CAISO will correct prices and further modify published prices after the timelines specified in Section 35.2, if so directed by the Federal Energy Regulatory Commission.~~

~~\* \* \*~~

### **35.3.2 Processing and Publication Issues**

~~The CAISO may make changes to published prices after the expiration of the timelines specified in Section 35.2 to remedy a price correction processing or publication issue, which consist of the types of issues further defined in this Section 35.3.2. The CAISO shall make any such changes within twenty (20) Business Days of the affected Trading Day. After the expiration of the applicable twenty (20) Business Days, in the event of a discrepancy between prices posted on the CAISO's OASIS and prices provided to Scheduling Coordinators through other means, the CAISO will use the price posted on OASIS for Settlement purposes unless as specified in Section 35.3.1. The CAISO will only remedy processing and publication pursuant to this section for cases in which the CAISO has actually identified and logged in its systems the need for a price correction for specific CAISO Markets intervals within the timeframe specified in Section 35.2, but cannot complete the price correction and post the corrected prices within that timeframe for the specific reasons described below. To the extent the CAISO is aware of a processing or publication issue prior to the expiration of the time-frame specified in 35.2, the CAISO will issue a public notification of the affected intervals, and the time at which it expects to remedy the issue, as soon as practicable. To the extent the CAISO only becomes aware of the issue after the expiration of the timeframe specified in Section 35.2, the CAISO will issue a public notification with this same~~

information, as soon as practicable. For purposes of the requirements in this Section 35.3, processing or publication issues shall consist of:

- a) Volumetric processing issue: The CAISO cannot complete the corrections and post the corrected prices within the timeframes specified in Section 35.2 because the price correction affects a large number of market intervals.
- b) Hardware or software issues: A software or hardware issue that impeded the CAISO from processing price corrections or publishing the corrected prices by the end of the timeframes specified in Section 35.2.
- c) Business process issues: A limitation, failure or error in implementing an established and identifiable business process that causes the publication of an incorrect price that is either corrected erroneously, or left uncorrected within the timeframes specified in Section 35.2.
- d) Complex manual corrections: The CAISO has identified and logged into its systems within the timeframe specified in Section 35.2 the need for price corrections that require specifically tailored methodologies to implement the correction because of the complexity of the issue, which in some cases may span across the CAISO Markets, and implementing this price corrections will require the publication of corrected prices beyond the timeframe specified in Section 35.2.

\* \* \*

### **35.6 Weekly Price Correction Report**

The CAISO shall summarize all price corrections that occur within a calendar week in a report that shall be posted on the CAISO Website by the seventh calendar day of the following calendar week. For all price corrections that occur during ~~each~~the calendar week covered by the weekly report, the price correction report shall specify: (a) ~~which the~~ market intervals ~~were~~ affected, (b) ~~which the~~ price locations ~~were~~ affected, (c) a brief description of the reason for the price correction, and (d) the method of price corrective action undertaken. In the event the CAISO fails to post this report, the CAISO will endeavor to post the report within six months of the affected calendar week, after which the failed report will no longer be issued.

\* \* \*

## Appendix A

\* \* \*

### - Day-Ahead Inter-SC Trade Period

The period commencing seven (7) days prior to the applicable Trading Day and ending at ~~noon~~ 11:00

Hours Pacific Time on the day prior to that Trading Day, during which time the CAISO will accept Inter-SC

Trades of Energy for the DAM from Scheduling Coordinators.

## **Stakeholder Process: Revisions to price correction requirements**

# **Summary of Submitted Comments**

**Stakeholders submitted three rounds of written comments to the ISO on the following date:**

- Round One, June 6, 2013
- Round Two, July 8, 2013
- Round Three, July 29, 2013

**Stakeholder comments are posted at:**

<http://www.caiso.com/informed/Pages/StakeholderProcesses/RevisionsPriceCorrectionRequirements.aspx>

**Other stakeholder efforts include:**

- Stakeholder Teleconference/Web Conference, May 30, 2013
- Stakeholder Teleconference/Web Conference, June 27, 2013
- Stakeholder Teleconference/Web Conference, July 22, 2013

Market Participant	Adjust the closing time of inter scheduling coordinator trades	Revise the time horizon for price corrections	Clarify the types of processing and publication issues	Provide more timely communication about price corrections	Change Scope for price corrections (Not included in the final proposal)
PG&E	Supports the change of closing time	Supports final day-ahead publication with timely notification of potential corrections.  Both accuracy and certainty of prices are important.	Supports 20 days for hardware/software issues and business process issues.  Supports the clarification of processing and publication issues.	Supports the changes for communicating price corrections.	Supports revisiting scope for real-time price spikes and congestion.
SCE		Emphasizes the importance of price accuracy.  ISO should have same or more flexibility than existing one to ensure prices are correct.  Supports 5 business days.	Four categories are acceptable for 20 days, but encourages more analysis to reduce from 20 days to 5 days.  Accuracy is most important.	Supports the proposed communication.	Supports expanding the scope for price corrections.
Six Cities	Supports accurate solution over publishing before 13:00	Accuracy is most important ISO should correct where the impact would be significant.  Supports 5 business days and even more days if market impact is high.	Four categories should be explicitly listed as a reason to extend window to 20 days.  No position on additional items, not opposed to additional categories.	Supports notice of potential price corrections.	No position on current scope but should be revisited to determine if additional items should be included to ensure accurate prices.
SMUD		Favors price accuracy over certainty, even if more time is needed.  Does not support shorter day ahead correction window if quality of analysis is compromised.  Price corrections should be addressed upfront.	Suggest a placeholder to be able to correct prices even after 20 days.	Does not find the communication of price correction in the 3 <sup>rd</sup> and 5 <sup>th</sup> day very helpful.	Believes that criteria in BPM where corrections will only be made for "good cause" based on assessment of market impact is too subjective and should be replaced with something more objective like a dollar threshold.

Market Participant	Adjust the closing time of inter scheduling coordinator trades	Revise the time horizon for price corrections	Clarify the types of processing and publication issues	Provide more timely communication about price corrections	Change Scope for price corrections (Not included in the final proposal)
Calpine		<p>Supports 3 business days for day-ahead price corrections.</p> <p>Supports 5 business days for real-time price corrections.</p> <p>Certainty is most important.</p>	<p>Four categories are acceptable for 20 days but no expansion of categories.</p> <p>If a price correction begins before the tariff deadline, but cannot be completed within the tariff deadline, the corrections should be allowed to continue.</p>	<p>Supports notice of potential price corrections but warns against flagging all prices.</p> <p>Supports final day-ahead publication with timely notification of potential corrections.</p>	<p>Strongly objects to price corrections for mismatched model flows or data update spikes.</p>
NRG Energy		<p>Supports 5 business day window.</p> <p>Does not support 20 day window.</p> <p>Certainty is most important.</p>		<p>Supports final day-ahead publication with timely notification of potential corrections.</p> <p>Supports extension of 13:00 deadline only for instances of gross error and only supports an extension of one hour.</p> <p>Notice is helpful but not critical.</p>	<p>ISO should work to ensure no systematic differences between its day-ahead and real-time markets, and that both markets accurately reflect system conditions as they are forecasted or realized at the time. These problems, however, are not price correction problems.</p>
WPTF	<p>Supports nominal delays in 13:00 deadline</p>	<p>Supports final day-ahead publication with timely notification of potential corrections.</p> <p>Values price certainty about the possibility of price corrections</p>	<p>Supports 20 business day window for processing.</p>	<p>Strongly encourages the ISO to develop a regular report of price correction investigations.</p>	<p>Supports the consideration of thresholds for corrections, especially for making the trade-off between posting in a timely manner or publishing suspect prices.</p>



Market Participant	Adjust the closing time of inter scheduling coordinator trades	Revise the time horizon for price corrections	Clarify the types of processing and publication issues	Provide more timely communication about price corrections	Change Scope for price corrections (Not included in the final proposal)
GridSpeak		Supports a 3 business day price correction window.  Timing and certainty is most important.	20 business days for catastrophic market events and complex manual corrections. Volumetric and business process issues should not have 20 business days.	Supports final day-ahead publication with timely notification of potential corrections. Would like to see day-ahead corrections only for catastrophic events rather than data input errors.	Does not support corrections for a data input error.
Morgan Stanley Capital Group	Does not oppose	Supports the timeline changes for day-ahead but prefers the current timeline for real-time is maintained.		Strongly supports notice of potential price corrections.  Communication about price corrections activities is useful but secondary.  More transparency is needed to dispel suspicions about the process.	Do not correct prices that are in error by less than \$0.25/MWh.  Recognizes that it will be complicated to create a standard for the magnitude of error that would warrant a correction.
Financial Marketers (Solios Power /SESCO/XO Energy)		Reducing the time horizon to 3 business days helps but does not alleviate underlying issues of why ISO must price-correct frequently.	Does not support the proposed clarifications about processing and publication issues.	Timely notification of price correction is very helpful, but is not a complete solution.	Believes that current three categories need clarity. Particularly the tariff inconsistency category and issues related to congestion.

# Memorandum

**To:** ISO Board of Governors

**From:** Mark Rothleder, Vice President – Market Quality & Renewable Integration

**Date:** September 5, 2013

**Re:** Decision on revisions to price correction requirements

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***This memorandum requires Board action.***

## EXECUTIVE SUMMARY

Management proposes to revise the day-ahead market timeline and three of the ISO's price correction processes to streamline and refine the ISO's price correction processes. Specifically, Management proposes to: 1) adjust the closing time of inter-scheduling coordinator trades; 2) revise the time horizon for price corrections; 3) clarify the types of processing and publication issues that may require changes in posted prices beyond the typical time horizon; and 4) provide additional communications regarding price corrections. The proposed changes will improve the accuracy and certainty of ISO market prices.

***Moved, that the ISO Board of Governors approves the proposed tariff change to implement the enhancements to the ISO price correction processes as described in this memorandum dated September 5, 2013; and***

***Moved, that the ISO Board of Governors authorizes Management to make all the necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.***

## DISCUSSION AND ANALYSIS

Through its price correction process, the ISO corrects invalid prices consistent with a set of criteria defined in the tariff and in the business practice manual for market operations. The intent of the price correction process is to ensure appropriate prices are used in settlements based on the best assessment of system and market conditions. Under the current tariff provisions, prices can be corrected for three reasons, including 1) market prices were

produced with a data input error, 2) a hardware or software failure renders the prices erroneous, and 3) the prices reflect an inconsistency with the tariff.

The ISO has gained three years of market experience since it last evaluated its price corrections procedures. With this additional market experience and through a stakeholder process conducted over the last three months, Management has identified specific refinements to the price corrections processes that will increase the accuracy and certainty of market prices. After careful consideration of input from stakeholders and ISO evaluation of its businesses processes, Management recommends the following four revisions:

1. *Adjust the closing time of inter-scheduling coordinator trades.* Management proposes to change the closing time for inter-scheduling coordinator trades from 12:00 hours to 11:00 hours. This new closing time will still provide sufficient time for participants to revisit their inter-scheduling coordinator trade bids after the day-ahead market is closed but will have the added benefit of no longer limiting the ISO to publishing day-ahead results prior to 12:00 hours. Currently, the ISO publishes its day-ahead market results, which includes the integrated forward market and the residual unit commitment process, by 13:00 hours.

2. *Revise the time horizon for price corrections.* Under the current tariff, the ISO corrects prices for applicable markets and intervals within five calendar days after the applicable trading day. The ISO will not make any price corrections after this price correction window has expired except as otherwise directed by the Federal Energy Regulatory Commission. These requirements apply to both day-ahead and real-time market prices. Management has determined, with the implementation of a robust validation process for the day-ahead market, that it can reduce the time horizon window for price corrections for the day-ahead market to provide for greater price certainty without compromising the validation effort to ensure prices are valid and accurate. Management proposes to reduce the time horizon for price corrections of the day-ahead market from five (5) calendar days to three (3) business days. In the case of the real-time market, Management has instead found that the current calendar-day based timeline poses a challenge when the fifth day falls on weekends or holidays. Therefore, Management proposes to modify the existing five (5) calendar days to five (5) business days. Using business days will allow the ISO to handle more efficiently the validation of the high volume of prices of the 5- and 15-minute real-time markets. This modification would also reduce the number of processing and publication issues that may occur during such times.

3. *Clarify the types of processing and publication issues.* Under the current tariff, the ISO is authorized to rectify price corrections publication and processing errors within 20 business days after the applicable trading day. Earlier in 2013, after a series of processing issues led to a large number of changes to published prices after the five day window, stakeholders raised a concern that there was insufficient visibility into what would constitute a price processing and publication issue. The tariff does not specify what exactly constitutes processing and publication issues. In response, Management proposes to include additional details regarding four categories of issues that might warrant correcting posted prices beyond the applicable time horizon. These four categories are based on the ISO's experience with price corrections processing and publication issues that warranted changes to posted prices after the price

correction time horizon over the past three years. Management proposes to retain the current practice of rectifying processing and publication issues within twenty business days after the affected trading day. The four categories are as follows:

- a) Volumetric issue. In these instances the ISO identifies the need for a price correction within the price correction time horizon, but the issue touches a large number of market intervals that cannot be processed within the price correction time horizon, even if the issue touches only a few nodes.
- b) Hardware or software issues. In these instances, the ISO identifies the need for a price correction within the price correction time horizon, but a software or hardware issue impedes the processing of corrections by the end of the price correction time horizon. In some instances, a hardware or software issue may impede the timely publication of prices that were corrected within the price correction time horizon.
- c) Business process issues. In these instances, the ISO identifies the need for and implements a price correction within the price correction time horizon, but a limitation, failure or error in implementing the business process causes the publication of an incorrect price.
- d) Complex manual corrections. For the most part, price corrections are implemented using pre-prepared scripts and are readily implementable. In some instances, the ISO identifies the need for a price correction within the price correction time horizon, but to correct the prices, the ISO needs to develop specifically tailored methodologies because of the complexity of the issue, which in some cases may span across the ISO markets. The implementation of these complex manual price corrections at times cannot be processed within the price correction time horizon, even if the issue touches only a few nodes.

For price corrections from any of these four groups, if the ISO identifies these issues within the price correction time horizon and the ISO expects these price corrections to be processed beyond the price correction time horizon, the ISO will identify the market intervals to be corrected. The ISO then queues these for processing, identifies the affected market intervals, and inform market participants of the time frame in which it expects to complete the processing of the price corrections, as discussed below.

4. *Provide timely communication about price corrections.* Management seeks to provide market participants greater visibility into the ISO's price correction instances. Currently, the ISO publishes a price correction report with details of the market and intervals corrected, including the reason for the correction. This report, however, is posted after the five-day window for corrections. Management proposes to provide, programmatically, more timely communication of price corrections in both the day-ahead and real-time markets. Management also proposes to communicate to the market when the ISO is experiencing processing and publication issues described above that may impact the timely posting of price corrections or may result in the modification of posted prices to rectify the processing and publication issues.

## **POSITION OF PARTIES**

The proposed revisions to price correction requirements received wide support from stakeholders. One concern raised in the process was that by reducing the time horizon for day-ahead price corrections, the ISO might be compromising the quality of the validation. As explained during the stakeholder process, Management's proposal strikes a balance between ensuring accurate prices and improving certainty. This change is enabled by the ISO's adoption of an enhanced pre-publication market validation process starting in 2013 through which the ISO is able to validate prices and identify possible issues prior to posting the day-ahead market results. This process has already led to fewer price corrections for the day-ahead market and Management anticipates that going forward, the bulk of issues potentially impacting the day-ahead market prices will be identified and resolved prior to publication of market results. Management proposes a post-publication three business day window to ensure that there is a time window to correct any issues that may still impact the day-ahead market results that were not identified or corrected through the pre-publication market results validation process.

A concern was also raised regarding whether to include detail in the tariff about the four categories of publication and processing issues for which the ISO will rectify beyond the price correction time horizon. Management concluded that given that the tariff already contemplated that these types of changes are possible, and given the concerns raised with the visibility on the actions the ISO took this past year, adding this detail in the tariff is preferred as it will provide greater visibility into what issues can lead to such changes.

At the start of the stakeholder process on this policy initiative, staff and stakeholders discussed the possible expansion of the reasons for which prices may be corrected to include calibrations to actual market conditions. Stakeholders' feedback was mixed on this item. Management proposes not to expand the scope of reasons for prices corrections at this time. Rather, Management commits to continue its efforts to enhance its market functioning and modeling, which will narrow the uncertainty that might affect the accuracy of prices. Management believes that addressing the root causes that lead to discrepancies in market input relevant to actual market conditions will lead to better market signals which will negate the need to explore the expansion of the scope for price corrections to start with. Modifications to the scope of price corrections should be considered only after evaluating the results of the current efforts that are in place to enhance market functioning and modeling.

## **MANAGEMENT RECOMMENDATION**

Revisions to price correction requirements and processes designed to improve the accuracy and certainty of prices in the market place are needed. Management's proposal is based on more than three years of market experience and addresses the primary issues that will lead to more accurate pricing and timely information. For these reasons, Management recommends that the Board approve the revisions to price corrections requirements described above.