Revisions to Price Correction Requirements

Straw Proposal

June 20, 2013
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I. Plan for Stakeholder Engagement

The proposed schedule for stakeholder engagement is listed below. If this stakeholder process results in the need for tariff changes, ISO management will present any proposed changes and policy recommendations to the CAISO Board of Governors in September 2013.

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thu 5/23/13</td>
<td>Issue Paper Posted</td>
</tr>
<tr>
<td>Thu 5/30/13</td>
<td>Stakeholder Call 10 am to 12 pm</td>
</tr>
<tr>
<td>Thu 6/6/13</td>
<td>Stakeholder Comments Due</td>
</tr>
<tr>
<td>Thu 6/20/13</td>
<td>Straw Proposal Posted</td>
</tr>
<tr>
<td>Thu 6/27/13</td>
<td>Stakeholder Call 10 am to 12 pm</td>
</tr>
<tr>
<td>Thu 7/8/13</td>
<td>Stakeholder Comments Due on Straw Proposal</td>
</tr>
<tr>
<td>Wed 7/15/13</td>
<td>Draft Final Proposal Posted</td>
</tr>
<tr>
<td>Wed 7/22/13</td>
<td>Stakeholder Call 1 pm to 3 pm</td>
</tr>
<tr>
<td>Wed 7/29/13</td>
<td>Stakeholder Comments Due on Draft Final Proposal</td>
</tr>
<tr>
<td>Thu-Fri 9/12-13</td>
<td>BOG</td>
</tr>
</tbody>
</table>
II. Background

The ISO FERC Electric Tariff (ISO Tariff) section 35.3 and section 8 of the BPM for Market Operations set forth the scope, process, and time horizon for price corrections. The intent of the price correction process is to ensure appropriate and accurate inputs are used in settlements as well as to ensure prices accurately reflect system conditions. The ISO corrects invalid prices pursuant to a set of requirements defined in the tariff, by either recalculating prices or selecting replacement prices from similar market intervals. The goal of the price correction is to produce prices that are as close as possible to the prices that should have resulted under the terms of the ISO tariff provisions had there been no issue. Under the current ISO tariff provisions, prices can be corrected due to: i) a data input error, ii) a hardware/software failure, or iii) an inconsistency with the tariff.

At the start of its new market design in 2009, the ISO set the time horizon for price corrections at eight days. In 2010, the ISO conducted a stakeholder process to review its price correction rules and processes. Out of that stakeholder process, the ISO proposed to reduce the price correction time horizon to five calendar days, with certain exceptions to accommodate processing and publication issues outside of that time frame.¹

The ISO committed to continuously review its price correction processes and results and consider further changes as necessary over time. Given the importance of producing correct prices and the need to weigh that against price certainty, and in light of its experiences over the past four years of market experience, the ISO is initiating this stakeholder process to discuss and identify improvements in the price correction rules and requirements, and if required, streamline and clarify the scope, reasons, and time horizon for price corrections.

III. Stakeholders’ Feedback

Based on the Issue paper posted on May 30th, the ISO hosted a conference call with market participants to launch the initiative. Stakeholders had the opportunity to provide comments about the initiative and the topics described in the issue paper. Ten market participants submitted comments for the Revisions to the Price Correction Requirements stakeholder process, including PG&E, SCE, Six Cities, SMUD, Calpine, NRG, WPTF, GridSpeak, Morgan Stanley Capital Group and Financial Marketers. The table below summarizes the stakeholders’ position on the items identified in the issue paper:

<table>
<thead>
<tr>
<th>Item</th>
<th>Support</th>
<th>Does not Support</th>
<th>No position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Day-Ahead publication with notice of potential corrections</td>
<td>7</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Modification of the 13:00 publication for day-ahead results</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Accuracy over certainty</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Notification of price corrections</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time horizon for price corrections</td>
<td>6</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Expand scope of price corrections</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Market Participant</td>
<td>Finality of Day Ahead Prices</td>
<td>Time Horizon for Price Corrections</td>
<td>Timely updates about price corrections</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------------</td>
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<td>--------------------------------------</td>
</tr>
</tbody>
</table>
| PG&E              | - Supports final Day-Ahead publication with timely notification of potential corrections  
                  |                              | - Supports 20 days for hardware/software issues and business process issues.  
                  |                              | - Supports 5 days for volumetric and manual corrections.  
                  |                              | - Both accuracy and certainty important  
                  |                              | - Supports 5 business days  
                  |                              | - Strongly supports notice of potential price corrections  
                  |                              | - Supports revisiting scope for Real-Time price spikes and congestion |
| SCE               | - CAISO should have same or more flexibility to ensure prices are correct  
                  |                              | - Four categories are acceptable for 20 days, but encourages more analysis to reduce from 20 days to 5 days  
                  |                              | - Accuracy is most important  
                  |                              | - Supports 5 business days  
                  |                              | - Request clear procedures on when prices are final.  
                  |                              | - Supports notice of potential price corrections  
                  |                              | - Supports expanding the scope for: 1) transitory real-time spikes not reflective of actual conditions, 2) prices that are not accurate due to transmission or generator outages, 3) prices that do not reflect actual due to software limitations such as loop flow or discrepancies in power flow |
| Six Cities        | - No position on final Day-Ahead prices and requests more details  
                  |                              | - Four categories should be explicitly listed as a reason to extend window to 20 days.  
                  |                              | - Supports notice of potential price corrections  
                  |                              | No position on current scope but should be revisited to determine if additional items should be |
## Revisions to Price Correction Requirements

<table>
<thead>
<tr>
<th>Market Participant</th>
<th>Finality of Day Ahead Prices</th>
<th>Time Horizon for Price Corrections</th>
<th>Timely updates about price corrections</th>
<th>Scope for price corrections</th>
</tr>
</thead>
</table>
| CAISO              | -CAISO should correct where the impact would be significant  
                   | -Supports accurate solution over publishing before 13:00  
                   | -No position on additional items, not opposed to additional categories.  
                   | - Accuracy is most important  
                   | included to ensure accurate prices. |
| SMUD               | -Does not explicitly address 13:00 deadline but states if more time is required for accurate pricing then SMUD supports a change to the timeline.  
                   | - Accuracy is most important even if more time is required  
                   | -Supports notice of potential price corrections  
                   | -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. |
| Calpine            | -Supports final Day-Ahead publication with timely notification of potential  
                   | -Supports 3 business days for Day-Ahead price corrections  
                   | -Supports notice of potential price corrections but warns against flagging  
<pre><code>               | -Strongly objects to price corrections for mismatched model flows or data update |
</code></pre>
<table>
<thead>
<tr>
<th>Market Participant</th>
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<th>Timely updates about price corrections</th>
<th>Scope for price corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>corrections</td>
<td>Real-Time price corrections</td>
<td>all prices.</td>
<td>spikes.</td>
</tr>
</tbody>
</table>
|                    | - Supports extension of 13:00 deadline if it results in accurate prices. 14:00 Pacific Time is an acceptable deadline. | - Four categories are acceptable for 20 days but no expansion of categories.  
- If a price correction begins before the tariff deadline, but cannot be completed within the tariff deadline, the corrections should be allowed to continue.  
- Certainty is most important | | |
| NRG Energy         | - Supports final Day-Ahead publication with timely notification of potential corrections  
- Supports extension of 13:00 deadline only for instances of gross error and only supports an extension of one hour. | - Supports 5 business day window  
- Does not support 20 day window  
- Certainty is most important | - Notice is helpful but not critical. | CAISO 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 forecast or realized at the time. These problems, however, are not price correction problems. |
| WPTF               | - Supports final Day-Ahead publication with timely notification of potential corrections  
- Supports extension of 13:00 deadline only for instances of gross error and only supports an extension of one hour. | - Supports notice of price | - Strongly encourages the | - WPTF supports the |
## Revisions to Price Correction Requirements

<table>
<thead>
<tr>
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<th>Time Horizon for Price Corrections</th>
<th>Timely updates about price corrections</th>
<th>Scope for price corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td>California ISO</td>
<td>publication with timely notification of potential corrections -Supports nominal delays in 13:00 deadline</td>
<td>correction within 3 business days and a 5 business day correction window. -Supports 20 business day window for processing</td>
<td>CAISO to develop a regular report of price correction investigations, reporting on events identified by market participants and the ISO.</td>
<td>consideration of thresholds for corrections, especially for making the trade-off between posting in a timely manner or publishing suspect prices. The thresholds should be informed by the number of intervals affected and the overall market impact</td>
</tr>
<tr>
<td>GridSpeak</td>
<td>-Supports final Day-Ahead publication with timely notification of potential corrections -Does not support delay of 13:00 deadline -Would like to see Day-Ahead corrections only for catastrophic events rather than data input errors.</td>
<td>-Supports a 3 business day price correction window. -20 business days for catastrophic market events and complex manual corrections. -Volumetric and business process issues should not have 20 business days. -Timing and certainty is most important</td>
<td>-Supports notice of potential price corrections</td>
<td>-Does not support corrections for a data input error</td>
</tr>
<tr>
<td>Morgan Stanley Capital</td>
<td>-Does not support delay of 13:00 deadline (Requests more aggressive 12:30</td>
<td>-Supports 5 calendar day window</td>
<td>-Strongly supports notice of potential price corrections.</td>
<td>-Do not correct prices that are in error by less than</td>
</tr>
</tbody>
</table>
## Revisions to Price Correction Requirements

<table>
<thead>
<tr>
<th>Market Participant</th>
<th>Finality of Day Ahead Prices</th>
<th>Time Horizon for Price Corrections</th>
<th>Timely updates about price corrections</th>
<th>Scope for price corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>deadline)</td>
<td>-Supports 5 calendar day window</td>
<td>-Supports notice of potential price corrections</td>
<td>$0.25/MWh</td>
</tr>
<tr>
<td></td>
<td>-Supports final publication on time with ASAP notification of potential corrections</td>
<td>-Believes that 5 day and 20 day timelines are inconsistent.</td>
<td>-Believes that current three categories need clarity. Particularly the Tariff inconsistency category and issues related to congestion.</td>
<td>-Recognizes that it will be complicated to create a standard for the magnitude of error that would warrant a correction.</td>
</tr>
<tr>
<td>Financial Marketers (Solios Power /SESCO/XO Energy)</td>
<td>-Supports delay of 13:00 deadline up to 18:00 with a market notice.</td>
<td>Supports a 2-hour notification for Real-Time prices.</td>
<td>-Believes that current three categories need clarity. Particularly the Tariff inconsistency category and issues related to congestion.</td>
<td>-Supports 5 calendar day window</td>
</tr>
<tr>
<td></td>
<td>-Supports final Day-Ahead publication with timely notification of potential corrections</td>
<td>-Believes that 5 day and 20 day timelines are inconsistent.</td>
<td>-Believes that current three categories need clarity. Particularly the Tariff inconsistency category and issues related to congestion.</td>
<td>-CAISO must develop a targeted and narrow definition of processing and publication issue.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-CAISO should issue a market notice for 20 day processing issues.</td>
<td></td>
<td>-Supports notice of potential price corrections. Notice on Day Ahead prices should be sent on the same day as publication.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-CAISO must develop a targeted and narrow definition of processing and publication issue.</td>
</tr>
</tbody>
</table>
IV. Scope of Initiative

This stakeholder initiative is focused on the scope, reasons, criteria, and time horizon of price corrections. In the Issue Paper, the ISO defined four items and invited stakeholders to identify any other pertaining topics that could be within the scope of the initiative.

Based on stakeholders’ feedback, the ISO is confining the scope of this initiative to the following items:

1. Revision of the scope for price corrections for the day-ahead market in order to provide more certainty about the finality of day-ahead prices.
2. Revision to the current five calendar day horizon for price corrections; finality of prices, definition of the scope for processing and publication issues and the use of the 20-day window to resolve processing and publication issues.
3. Timely updates of issues potentially leading to price corrections.

In their comments, various stakeholders referred to other items for consideration in this initiative. The ISO believes that these items do not fall within the scope of price corrections, as explained in this section.

Both Morgan Stanley Capital Group and Western Power Trading Forum requested to include in this initiative the discussion of Administrative Pricing. This item refers to administratively setting prices under emergency conditions. On June 13, 2012 the Federal Energy Regulatory Commission approved the ISO petition to waive tariff provisions for setting administrative prices and settling real-time market transactions in response to the September 8, 2011 Pacific Southwest power outage. The order accepted the ISO commitment to convene a stakeholder process, within 30 days from the order date, to examine tariff provisions regarding the nature of market intervention in the event of a significant system emergency and the settlement implications of a force majeure event. There is currently an existing stakeholder process to specifically address all the policy items related to administrative pricing. The ISO believes the discussion of the administrative pricing should continue its own and already existing stakeholder process and therefore, is not expecting to include this item within the scope of this price corrections initiative.

Furthermore, Western Power Trading Forum requested that the analysis of changes to constraint limits which may result in congestion offsets also be included in this initiative. The ISO

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2 Information about this initiative is available at http://www.caiso.com/informed/Pages/StakeholderProcesses/AdministrativePricingRules.aspx.
believes that the items related to congestion offsets and market modeling and its analysis are beyond the scope of price corrections and hence, will not include them in this initiative.

It is worth to notice that in addition to this price correction initiative, the ISO is pursuing mitigation measures for root causes of price corrections, such as improving internal ISO processes and pursuing software enhancements. One of these improved processes is the item described to proactively monitor and validate the day-ahead market.

V. Description of Straw Proposals

V.I Revision of the scope for price corrections for the day-ahead

In 2012 the day-ahead market experienced an increased volume and frequency of price corrections. The ISO took certain steps within its current tariff authority to refine its processes for validation of the day-ahead market results prior to publication of prices in order to minimize the need for price corrections. Given the time horizon for conducting the day-ahead market, there is a short window of time to validate market results before publication. The ISO has implemented proactive validation and monitoring of the day-ahead market to identify issues prior to publication. When a data or software issue is identified, the ISO uses the short window to resolve the issue and, if feasible, rerun the day-ahead market with the correct information, before issuing the market results. This validation leverages the ability to run the market two days in advance in what is referred to as the DA+2 pre-market run. Each day, this DA+2 pre-market run is implemented right after the actual run for the next trading day is complete. The same hardware and software is used for this run, using the most recent information available for outages and transmission constraints, and using a set of historical market bids. This DA+2 pre-market run is, therefore, the most readily available and accurate projection of the results for the actual day-ahead market to be run next morning. Having this run two days in advance allows the ISO to identify potential issues that need further investigation to be resolved before reaching the next morning when the actual day-ahead market is run.

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 software or data that required a rerun of the day-ahead market. However, in some instances where an issue has been identified and is being resolved, publishing results by the 13:00hrs target for publishing the day-ahead market results has been challenging. This effort has resulted in avoiding price corrections after the day-ahead market results are published. In some instances, the ISO has had to proceed to publishing day-ahead market results even after an issue is identified because the ISO was not able to identify the precise cause of the issue and correct the underlying problem within a reasonable time. For
example, this has happened where the problem resides in a market functionality which the ISO cannot temporally fix while running the market. In such instances, a software patch maybe required from the software vendor, which could only arrive after publication. After publishing results the ISO still pursues further validation of market results within the five-day window, and if there proves to be an issue, the ISO will make the price correction, as feasible and as permitted within the tariff requirements. This proactive validation has avoided subsequent price corrections, but the trade-off may be not meeting the publication target for publishing the day-ahead market results of 13:00hrs. This is a trade-off between accuracy and price certainty, and timely publication. The ISO seeks stakeholders’ feedback about this this trade-off.

Given the financial impact of price corrections for the day-ahead market, certain stakeholders have expressed their concerns about price corrections for the day-ahead market. Stakeholders have also expressed a need for timely disclosure of major events impacting the day-ahead market. Currently, price corrections impacting the day-ahead market, or the real time market, are known by participants either by reaching the end of the five-day window when corrected prices are actually posted, or by the release of information by the ISO about a specific event through market notices or discussions in the fortnightly market update call. As required by Section 35.6 of the ISO tariff, the ISO provides a price correction report indicating the applicable market run, reasons to correct, and method used to correct prices. Given the cycle for generating this report, the information is posted after the corrected prices are already posted. The timing of this information creates uncertainty of the finality of day-ahead prices.

Based on the experience gained by the enhanced validation of the day-ahead market, the ISO has found that issues affecting the day-ahead market results are identified, and the bulk of these are resolved, before publishing results. When an issue is identified only after the posting of the results, for which the ISO later made a price correction, it has generally been the case that the issue had a more subtle impact on the overall market results or that it had only a local impact. Whether the issue has been identified with the proactive validation or with the post-validation, the information about price corrections is known to participants only by the end of the five-day window. Also, day-ahead market results that did not raise any concerns through the proactive validation and that were not subject to any price correction are treated the same way as those subject to corrections. That is, participants are not informed that there are no corrections for such prices until after the end of the five-day window. Again, there is uncertainty over the finality of all day-ahead prices during that time frame, even when prices do not ultimately require a price correction.
California ISO

Revisions to Price Correction Requirements

Straw Proposal

Based on the item posed in the Issue Paper and on the generally supportive feedback from stakeholders the ISO is proposing a modification to the existing requirements of price corrections in regards to both the day-ahead and real-time market.

First, leveraging on the enhanced process to proactively validate the day-ahead market, by the time of publication the ISO is generally aware of any major issues impacting the day-ahead market that may require price correction. If a potential issue is identified and the ISO is not able to reach reliable grounds for correcting an input or is unable to conduct the re-run and correct the issue before publication, this day-ahead case will be flagged and subject to further validation and to a possible correction, if applicable, after publication of results. The ISO would inform the market about such instances right after publication of the day-ahead market results. If the ISO did not find any potential issue during the monitoring and validation prior to publication, then there will be no notification about the status of the day-ahead prices. The ISO is cognizant that there may be instances where the proactive validation did not detect any issues, but it happens that there is a more subtle issue impacting the market which may require indeed a price correction. For this type of instances the ISO will still pursue further validation and any price correction if applicable within the time window for price corrections. In case the ISO deems the prices need to be corrected after publication, the ISO will inform the market as soon as practical about the price corrections taking place.

Second, the ISO is certain that the gross of the issues can be identified, and in several instances actually remediated, before publication and for this reason the ISO is proposing to reduce the time window for price corrections of the day-ahead market to three (3) business days. This reduced window compounded with timely notification of price corrections will provide for more certainty about the finality of day-ahead prices. The ISO believes this proposal strikes a balance between the current requirements and the ideas discussed in the first round of this initiative where the ISO explored if the prices should be render final by the time of publication. This straw proposal takes into consideration on the one hand the needs to provide more certainty about the finality of prices as raised by various stakeholders, and on the other hand provides for a time window to execute further validation and ensure there is sufficient time to not compromise the accuracy of prices for the potential instances where an issue is found after the publication of prices. It is important to highlight that the ISO is revisiting the requirements to ensure a solid process is in place for when price corrections are needed; however, the primary focus of the ISO is to address the root causes of price corrections. This straw proposal is in addition to efforts by the ISO to pursue long term solutions to root causes leading to price corrections.
Third, in adopting the pre-market publication validation process, the ISO is cognizant of the potential impact to the publication target (currently at 13hrs). In instances where the ISO is actively resolving any data or software issue that may impact the day-ahead prices, it may result in a delay publication of the day-ahead market results. Stakeholders were generally supportive to tolerate certain delay in the publication of the day-ahead market results. The ISO would like to preserve the 13hrs target, with the expectation that delays beyond 13hrs may be infrequent. In order to accommodate for the need for more validation and without compromising the publication target, the ISO is proposing two changes to the day-ahead timeline. First, historically there are several instances where the day-head market is complete and ready for publication before 12pm. With the current requirements, the day-ahead market cannot be published before 12pm because the closing time for the inter scheduling coordinator (SC) trades is at 12pm. The ISO is proposing to change the closing time for inter scheduling trades from 12pm to 11am. This new closing time will still provide a time window for participants to revisit their inter-SC trade bids after the day-ahead market is closed and will eliminate the current barrier for the ISO to be able publish results only after 12pm. The second change the ISO is proposing in this regard to unbundle the publication of day-ahead market results. Currently, the day-ahead process consists of three sequential processes: Local Market Power mitigation (LMPM), Integrated Forward Market (IFM) and Residual Unit Commitment (RUC). The current target is the publication of results for all three processes by 13:00hrs. The ISO is proposing to have the flexibility to publish results for RUC separately from those of MPM and IFM. This will help ensure IFM results are more consistently published on time, with RUC results being published afterwards when there is need for more validation and resolving issues before publication.

V.II Time horizon for price corrections

Section 35.2 of the ISO tariff provides that up to five calendar days after the applicable trading day, the ISO can make a price correction for the applicable market and intervals. 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 or for the limited reasons stated in section 35.3. Section 35.3 of the ISO tariff stipulates:

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 after 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.

The ISO has a time window of 20 business days after the applicable trading day for resolving processing and publication issues, as defined in the business practice manual for Market Operations, section 8.1.6.2.

The price correction end-to-end process is composed of price validation and price-correction implementation. In the first phase, market results, including prices, are programmatically validated. The outcome of that process is the determination of whether a price is correct or not, and if applicable what approach needs to be used to correct the identified prices in error (selective recalculation, rerun, interval replacement). The second part of the process is more related to the actual processing of the corrections, which is conducted through a set of automated procedures with predefined methods for correcting erroneous prices depending on the method chosen to correct prices. Normally, the recalculation of prices is done in a matter of minutes using the automated tools. The prices are then updated in the downstream repository system, and then the corrected prices are posted on OASIS. The majority of price corrections is done with one of the preset methods and the ISO perform all the steps required to have a price correction complete before the end of the fifth day.

The ISO’s experiences over the past three years provide a number of processing and publication examples that the ISO now wishes to clarify with stakeholders. The processing and publications challenges experienced by the ISO can be categorized as follows:

a) Volumetric issue. In some instances prices need to be corrected for multiple time intervals. Even if there are only a few nodes to be price corrected, process wise, the same sequential steps need to take place. Market intervals to be corrected are queued for processing, and in some cases some of the records may be processed after midnight of the 5th day.

b) Hardware/software issues. In several instances, although the ISO has made the determination of incorrect prices and the need to correct for those, a software or hardware issues impedes the processing of the corrections by the end of the fifth day.
other instances, the corrected prices may have been corrected within the five-day window, but they are overwritten after the fact.

c) Business process issues. Although the ISO may have made the determination for price corrections, a limitation or failure in the business process to properly reflect such corrections impedes the publication of price corrections by the end of the fifth day.

d) Complex manual corrections: For the most part, price corrections are implemented using pre-prepared scripts and are readily implementable. On occasion the nature of the issue resulting in erroneous prices may require the use of tailored methodologies and thus the preset methods cannot be used. This approach is required to selectively correct the prices in error without impacting the overall set of prices. Since prices may need to be corrected for multiple market intervals across all markets, these tailored methodologies need to be comprehensive enough to cover the different potential scenarios found in the market. If the volume of the prices that need to be corrected is large, manually correcting the prices may not be feasible. When such scenarios are found, the ISO may have challenges doing the processing of such price corrections by the end of the fifth day.

Straw Proposal

The straw proposal for this item is threefold.

First, as described in the previous section, the ISO proposes to reduce the time horizon for price corrections of the day-ahead market from five (5) calendar days to three (3) business days. Concurrent with this, the ISO proposes to use five (5) business days instead of the existing five (5) calendar days for correction of real-time market prices. The ISO has also determined that the current five calendar requirement specified in Section 35.2 of the tariff poses a challenge when the fifth day falls on a weekend or holiday. Using business days will allow to more efficiently handle the instances where there are complex price corrections potentially affecting a large volume of prices to validate and, potentially, correct. For one day, the real time market has 288 five-minute markets plus 96 15-minute pre-dispatch markets; this is in contrast to 24 intervals of the day-ahead market. Using the existing calendar days reduces the effective time for validation and may lead to more instances of processing and publication issues to finalize the corrections within the time horizon. This modification would help the ISO to minimize processing and publication issues that occur during such times. Stakeholders were generally supportive about migrating to the use of five business days. For the sake of reference, the following figures provide a comparison of time horizon for price corrections among other ISOs.
Second, with the end-to-end process involving the reliance on multiple systems and data flow along these systems and the existence of predefined tools, there are various points for the process to encounter processing and publication issues. Based on the price corrections experiences over the past three years and with the various types of processing and publication issues observed, the ISO seeks to clearly define through this stakeholder process what a processing and publication issue is for which the 20-business day window can be used. This will serve to have a clear
expectation of the course of action when the ISO experiences such type of processing and publication issues. The current business practice is that within the five-day window for price corrections the process starts with the validation of market solutions, continues with any determination of prices corrections, and it does not stop until corrected prices are posted on OASIS. If the ISO encounters any challenges to fully process the price corrections that results in posting information beyond the five days as described in the four categories above, the ISO deems this to be part of processing and publication issue, for which the 20-day window exists. The ISO believes that processing and publication issues, even if the issues are not known before the expiration of the five-day window, should not limit the completion of correcting prices identified to be in error once the determination for price correction has been made and the process has started. Once the ISO establishes the list of permitted uses, the ISO intends to supplement its tariff or business practice manual with such detail and confine corrections beyond the five days to such identified issues.

Third, one concern from dealing with processing and publication issues after the five day horizon is the uncertainty about the finality of prices. Through the experiences of the last events, the ISO has also identified a need for improvement in its process to provide more timely updates about price correction when it experiences a processing or publication issue that falls under the 20 day window. When the ISO encounters, and is aware of, a processing and/or publication issue that would impede the successful posting of corrected prices within the five-day calendar window for corrections, the ISO will inform the market about the delay as soon as practical. The ISO will provide details as to the reason for having the price correction, the markets impacted and the expected time to finalize the posting of corrected prices. The ISO will define during the implementation stage of this proposal the programmatic means to have this communication with the market, either through a market notice, an email or a posting on the ISO website.
V.III Timely updates of issues potentially leading to price corrections

Market Participants have raised concerns about not having timely updates of price corrections. The ISO publishes a price correction reports 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. To address participants’ concerns, the ISO started to post market notices when major events impacted the day-ahead market and resulted in price corrections.

Straw Proposal

As explained in the previous two subsections, the ISO is committing to provide more timely information about price corrections, namely

i) When then day-ahead market is impacted, the ISO will provide a notice after the publication of results indicating these prices are still subject to validation and potential price correction; this notice will provide technical details as to the suspect price as practical as possible. If there are no prices flagged during the pre-publication validation, the ISO will not provide any notices; the lack of a notice will indicate that the pre-publication validation has not detected any issues. If the ISO finds an issue that merits a price correction after the publication of the day-ahead results, the ISO will inform the market about such correction as soon as practical within the proposed three business day window. If the ISO does not find any issues after the publication of results and there are, therefore, no prices corrections, there will be no notice to the market about this; the lack of a notice will indicate the ISO did not pursue any further price correction.

ii) For the real time market, the dynamics are fairly different as for the ability of the ISO to validate prices before publication. Real-time dispatch prices are published every five minutes and there are more elements to validate in comparison to the day-ahead market. On the one hand, some participants prefer to have the prices subject to validation flagged as soon as possible. Historically, a very low percentage of the prices internally flagged for validation actually materialized in price corrections. As pointed out by other stakeholders, if too many prices are flagged this mechanism will not provide any greater certainty about the finality of the real-time prices and may render the flagging process not very useful. For this reason, the ISO is not proposing to implement a proactive flagging of real-time prices subject to validation. However, the ISO recognizes that when there are challenges to fully complete the price corrections, the market is unaware of such corrections. The ISO
has also identified a need for improvement in its process to provide more timely updates about price correction when it experiences a processing or publication issue that falls under the 20 day window. When the ISO encounters, and is aware of, a processing and/or publication issue that would impede the successful posting of corrected prices within the five-day calendar window for corrections, the ISO will inform the market about the delay as soon as practical. The ISO will provide details as to the reason for having the price correction, the markets impacted and the expected time to finalize the posting of corrected prices. The ISO will define during the implementation stage of this proposal the programmatic means to have this communication with the market, either through a market notice, an email or a posting on the ISO website.

V.IV Redefinition of criteria for price corrections

As per tariff requirements, section 35.4, the scope of price corrections is confined to instances of invalid market solutions or invalid market prices. The ISO practice has been to pursue price corrections as long as there is an issue identified that renders the prices to be incorrect, namely software/hardware issue, data input error or results inconsistent with the tariff. Stakeholders have expressed concerns in different forums about the scope of price corrections. Some have expressed that price certainty is more important than accuracy, mainly in regards for the day-ahead prices. Others have expressed that the transitory real-time spikes driven by the inherent working logic of the market software (such as transitory spikes when a data update happens) should also be corrected as they may not track closely the reality of system conditions. Another item concern is when congestion is observed in the market on a given transmission constraint, but actual flows may not be tracking closely given data misalignment such as the market running with certain transmission configuration while in the actual system some switching may have taken place and that it is not visible to the market system yet, or when the ISO system may not have full visibility of flows coming from elsewhere into the system. As of now this type of issues leading to high prices are not within the scope of price corrections.

In the Issue Paper the ISO considered this item for discussion with stakeholders. Stakeholders’ feedback was not in consensus. Some parties believe that the current scope of prices corrections needs to be expanded, while other parties do not agree. Given the lack of a generally supportive feedback, the ISO will no longer consider this item within the scope of this initiative and will preserve the current scope. It is worth noticing the ISO continue its efforts to enhance its market functioning and modeling. Several of these efforts have been the result of the market validation carried out within the price validation process and has resulted in enhanced processes.
and modeling and enhanced functioning logic of the market software. As voiced by some stakeholders, the ISO believes that addressing the root causes will consequently lead to better market signals which will negate the need to explore the expansion of the scope for price corrections to start with. The ISO would like to give some opportunity for the results of such improvements to realize in order to evaluate their effectiveness before moving forward with any modification to the scope of price corrections.

VI. Next Steps

The ISO will discuss the issue paper with stakeholders during a teleconference to be held on June 27, 2013. Stakeholders should submit written comments by July 8, 2013 to PCprocess@caiso.com