California Independent
System Operator Corporation

May 3, 2011

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. ER11-____-000
Filing to Clarify Tariff Provisions Relating to the Self-Provision of Regulation and Request for Waiver

Dear Secretary Bose:

The California Independent System Operator Corporation (ISO) submits this filing to clarify provisions of the ISO tariff relating to self-provision of regulation services. Specifically, the ISO proposes to clarify that a scheduling coordinator that seeks to self-provide regulation must submit an energy self-schedule at a level that would permit the unit to move either up or down depending on the type of regulation service (regulation up or regulation down) that it intends to self-provide.

The ISO also respectfully requests waiver of the Commission's notice and comment regulations to permit the tariff revisions contained in this filing to become effective as of May 24, 2011 (*i.e.*, three weeks after the date of this filing). As discussed further below, good cause exists for the waiver of the notice and comment regulations in order to prevent market performance problems that occurred in the ISO's day-ahead market in January and February of this year caused by the submission of economic bids (as opposed to self-schedules) with submissions to self-provide regulation by one market participant.

I. Background and Need for Tariff Clarification

In January and February of 2011, the ISO experienced three occasions of serious degradation in the performance of its day-ahead market that each caused an approximately one-hour delay in reaching a market solution and

delayed the publication of the day-ahead market at 1:00 PM.[1] On eleven other occasions during this period, less serious delays occurred. Although the ISO was able to publish day-ahead market results by 1:00 PM, performance degradation eliminated any opportunity to review the market results or re-run a market application.[2] Had the ISO's operators taken the additional time to review the market results and, if needed, re-run a market application, the 1:00 PM deadline would definitely have been missed.[3]

In February 2011, the ISO launched an investigation into the cause of the market performance degradation. By the first week of March 2011, the investigation concluded that the root cause of the performance degradation was the submission of economic energy bids, instead of energy self-schedules, in conjunction with submissions to self-provide regulation.[4] This degradation occured because submitting an economic bid in conjunction with a submission to self-provide regulation results in a noticeable increase in solution time, due to the unnecessary excess time required to perform computations inside the optimization algorithm to check for unfeasible solutions while honoring the self-provision of regulation for the subject resource. As part of its analysis, the ISO re-ran all of the instances in which an economic bid was submitted with a submission to self-provide regulation, substituting energy self-schedules sufficient to cover the self-provided amount of regulation, and found that the market software performed normally: namely, it reached a solution within the normal timeframe for the ISO to publish the day-ahead market results while also allowing for operators to review the market results of the applications and, if needed, to re-run the applications while still publishing by 1:00 PM.[5] It is noteworthy that a single economic bid from one market participant was sufficient to cause each occurrence of this one-hour delay.[6]

Because delays caused by market performance problems involve delays not only in publication of market results but also delays in reaching a market solution, the submission of economic bids in conjunction with submissions to self-provide regulation is problematic. This bidding activity may prevent operators from being able to review the results of each market application and conduct

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[1] This one-hour delay was comprised of an approximately 45-minute delay in running the Market Power Mitigation-Reliability Requirement Determination and a 15-minute delay in running the Integrated Forward Market. *See* Attachment C, Declaration of Khaled Abdul-Rahman at 5.

[2] *Id.*

[3] *Id.*

[4] *Id.* at 6.

[5] *Id*.

[6] *Id.* at 7.

necessary re-runs of an application when errors are detected while still meeting market timelines, thereby degrading the quality of the market results. In addition, if a serious enough delay occurs the ISO may be unable to reach a solution at all, resulting in a market failure. This would force ISO operators to manually intervene under the ISO's authority to prevent additional market disruptions by removing problematic bids or taking other action to ensure a market solution. To the extent operator intervention would require the ISO to delete submissions to self-provide regulation, the ISO would then need to procure additional regulation in the real-time markets, increasing the risk that necessary regulation might not be obtained and potentially resulting in higher costs to customers.[7]

Section 30.5.2.6 of the ISO Tariff currently specifies that a scheduling coordinator must provide an accompanying energy bid when it makes a submission to self-provide any ancillary service.[8] This provision, however, does not distinguish between economic energy bids,[9] which are bids that include both price and quantity information, and self-schedules, which only include quantity information, such that the resource will act as a price taker. Nor does this tariff requirement distinguish between spinning reserve and non-spinning reserve, on the one hand, and regulation, on the other hand. This lack of specificity is problematic because with respect to regulation, the submission of economic bids in conjunction with a submission to self-provide regulation creates market performance problems of the type discussed above.

In order to avoid future problems, the ISO is proposing to amend two provisions of its tariff in order to clarify that a submission to self-provide regulation must be accompanied by a self-schedule for energy at the appropriate level in order to allow the self-provision of regulation. This change merely makes explicit what the ISO believes to be implicit in the tariff and is fully consistent with the expectations of the overwhelming majority of market participants that self-provision of regulation entails a self-commitment and a self-schedule above minimum load to support the self-provision. With the exception of submissions by a single market participant of economic energy bids instead of energy self-schedules as discussed above, the ISO believes that all submissions to self-provide regulation have been accompanied by an energy self-schedule rather than an energy supply bid. For these reasons, the tariff amendments detailed in

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7 *Id*. at 8.

8 ISO Tariff, Section 30.5.2.6 ("If a Scheduling Coordinator's Submission to Self-Provide an Ancillary Service is qualified as specified in Section 8.6, the Scheduling Coordinator must submit an Energy Bid that covers the self-provided capacity prior to the close of the Real-Time Market for the day immediately following the Day-Ahead Market in which the Ancillary Service Bid was submitted.").

9 In the ISO Tariff, economic energy bids are also referred to as energy supply bids.

Section II below are just and reasonable and should be accepted by the Commission.

II. Proposed Tariff Revisions

The ISO's proposed tariff modifications are set forth in Attachments A and B to this transmittal letter. These modifications affect ISO tariff sections 30.5.2.6.1 (Regulation Up or Regulation Down Bid Information) and 30.7.6.1 (Validation of Ancillary Services Bids). The primary change is the addition of language in Section 30.5.2.6.1 specifying that submissions to self-provide regulation will be erased unless they are accompanied by a self-schedule at a level that would permit the resource to provide either regulation up or down based on the resource's regulation limits. For regulation down, this level is the resource's lower regulation limit, and for regulation up, this level is the resource's upper regulation limit. The ISO is also proposing to add language to Section 30.5.2.6.1 to clarify that bids for regulation (as opposed to submissions to self-provide regulation) must be accompanied by either an energy supply bid or an energy self-schedule at the appropriate level depending on whether the bid is for regulation up or regulation down.

The ISO has also made modifications to Section 30.7.6.1 relating to validation of ancillary services bids to conform this section with the changes made to Section 30.5.2.6.1 and to differentiate between the treatment of self-submissions of ancillary services for regulation versus self-submissions of ancillary services for operating reserves. Currently, Section 30.7.6.1 provides that if a resource is awarded or has qualified self-provided ancillary services in the day-ahead market, and no energy bid is submitted to cover the awarded or self-provided ancillary services, the ISO will generate or extend an energy bid as necessary to cover those services based on values in the master file. The ISO is proposing to amend this language to state that such generation or extension will only be performed for awarded ancillary service bids or self-provided operating reserves (and will be in the form of an energy supply bid), and to state that the failure to submit an energy self-schedule to support a submission to self-provide regulation will result in the submission to self-provide regulation being rejected.

III. Stakeholder Process

On April 5, 2011, the ISO commenced an expedited stakeholder process to discuss tariff changes to address the issue of market performance problems caused by the submission of economic energy bids in conjunction with a submission to self-supply regulation. On that date, the ISO posted draft tariff language for stakeholder review and requested comments by close of business on April 12, 2011. The ISO then conducted a conference call with stakeholders on April 19 to discuss the proposed tariff modifications. During this process, no stakeholder voiced opposition to the proposal to make explicit the energy self-

schedule requirement. Also, no stakeholder voiced opposition to the ISO's proposal to file this tariff change as a tariff clarification or to seek waiver of the 60-day notice requirement so that the ISO could enforce the energy self-schedule requirement as soon as possible.

IV. Effective Date and Request for Waiver and Shortened Comment Period

The ISO respectfully requests waiver of the Commission's regulations to permit the tariff revisions contained in this filing to become effective as of May 24, 2011 (*i.e.*, three weeks after the date of this filing).[10] Waiver of the 60-day notice and comment period is justified in this instance because of the need to prevent submissions of economic bids from causing further delays in the performance of the ISO's day-ahead markets and to mitigate the risk of a market failure. Accordingly, the ISO submits that the better solution is to expeditiously clarify its tariff and conform its software in order to eliminate this gap.[11]

Further, it is noteworthy that none of the parties that participated in the ISO's stakeholder process raised any objection to the ISO's proposal, including the proposal to waive the 60-day notice requirement so the change could be implemented as soon as possible. In addition, this clarification has no impact on market participant processes – beyond the requirement to submit a self-schedule. Therefore, the ISO believes that no party will be prejudiced by granting such a waiver. For these reasons, granting waiver of the 60-day notice and comment period so as to allow the modifications proposed herein to become effective as of May 24 is appropriate.[12]

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:

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[10] Specifically, the ISO requests waiver, pursuant to Section 35.11 of the Commission's regulations (18 C.F.R. § 35.11) of the notice requirements set forth in Section 35.3 of the Commission's regulations (18 C.F.R. § 35.3). The ISO intends to implement the software requirements associated with this tariff amendment after the close of the day-ahead market on May 24, 2011. The software change will apply to all open markets, *i.e.*, to any hours of the real-time market for the May 24 trading day that have not closed and to the day-ahead market that will run on May 25, 2011 for the May 26 trading day.

[12] *See California Independent System Operator Corporation*, 128 FERC ¶ 61,282 at P 34 (2009) (accepting the ISO's request for waiver of the 60-day notice and comment period in order to allow the ISO to implement, one day after its filing, tariff revisions permitting scheduling coordinators to change their start-up and minimum load cost compensation elections more frequently).

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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:

Attachment A	Revised ISO tariff sheets that incorporate the proposed changes described above
Attachment B	The proposed changes to the ISO tariff shown in black-line format
Attachment C	Declaration of Khaled Abdul-Rahman

VIII. Conclusion

For the foregoing reasons, the ISO respectfully requests that the Commission accept the proposed tariff changes proposed in this filing to become effective as of May 24, 2011 as described herein. Please contact the undersigned if you have any questions regarding this matter.

Respectfully submitted,

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Attachment A – Clean Tariff

California Independent System Operator Corporation

Fifth Replacement FERC Electric Tariff

Energy Self-Schedule Requirement for Self-Provision of Regulation

May 3, 2011

ER11-___-000

30.5.2.6.1 Regulation Up or Regulation Down Bid Information

In the case of Regulation Up or Regulation Down, the Ancillary Services Bid or submission to self-provide must also contain: (a) the upward and downward range of generating capacity over which the resource is willing to provide Regulation within a range from a minimum of ten (10) minutes to a maximum of thirty (30) minutes; and (b) the Bid price of the capacity reservation, stated separately for Regulation Up and Regulation Down ($/MW). In the case of Regulation Up or Regulation Down from Dynamic System Resources, the Ancillary Services Bid must also contain the Contract Reference Number, if applicable. Ancillary Services Bids submitted to the Day-Ahead or Real-Time Market for Regulation need not be accompanied by an Energy Supply Bid that covers the Ancillary Services capacity being offered. A Regulation Down Bid will be erased unless there is an Energy Supply Bid or Energy Self-Schedule at a level that would permit the resource to provide Regulation Down to its lower Regulation Limit. A submission to self-provide Regulation Down will be erased unless there is an Energy Self-Schedule at a level that would permit the resource to provide Regulation Down to its lower Regulation Limit. A Regulation Up Bid will be erased unless there is an Energy Supply Bid or Energy Self-Schedule at a level that would permit the resource to provide Regulation Up within its Regulation Limit. A submission to self-provide Regulation Up will be erased unless there is an Energy Self-Schedule at a level that would permit the resource to provide Regulation Up within its Regulation Limit.

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30.7.6.1 Validation of Ancillary Services Bids

Throughout the validation process described in Section 30.7, the CAISO will verify that each Ancillary Services Bid conforms to the content, format and syntax specified for the relevant Ancillary Service. If the Ancillary Services Bid does not so conform, the CAISO will send a notification to the Scheduling Coordinator notifying the Scheduling Coordinator of the errors in the Bids as described in Section 30.7. When the Bids are submitted, a technical validation will be performed to verify that the bid quantity of Regulation, Spinning Reserve, or Non-Spinning Reserve does not exceed the certified Ancillary Services capacity for Regulation, or Operating Reserves on the Generating Units, System Units, Participating Loads, Proxy Demand Resources, and external imports/exports bid. The Scheduling Coordinator will be notified within a reasonable time of any validation errors. For each error detected, an error message will

be generated by the CAISO in the Scheduling Coordinator's notification screen, which will specify the nature of the error. The Scheduling Coordinator can then look at the notification messages to review the detailed list of errors, make changes, and resubmit if it is still within the CAISO's timing requirements. The Scheduling Coordinator is also notified of successful validation. If a resource is awarded or has qualified Self-Provided Ancillary Services in the Day-Ahead Market, the following rules will apply: (1): if no Energy Self-Schedule is submitted to support a Submission to Self-Provide an Ancillary Service for Regulation, the Submission to Self-Provide an Ancillary Service will be invalidated; (2) if no Energy Supply Bid is submitted to cover the awarded or Self-Provided Ancillary Services for Spinning Reserve or Non-Spinning Reserve by the Market Close of HASP and the RTM, the CAISO will generate or extend an Energy Supply Bid as necessary to cover the awarded or Self-Provided Ancillary Services capacity using the registered values in the Master File and relevant fuel prices as described in the Business Practice Manuals for use in the HASP and IFM. If an AS Bid or Submission to Self-Provide an AS is submitted in the Real-Time Market for Spinning Reserve or Non-Spinning Reserve without an accompanying Energy Supply Bid at all, the AS Bid or Submission to Self-Provide an Ancillary Service will be erased. If an AS Bid is submitted in the HASP or Real-Time Market for Spinning Reserve and Non-Spinning Reserve with only a partial Energy Supply Bid for the AS capacity, the CAISO will generate an Energy Supply Bid for the uncovered portions. If a Submission to Self-Provide an Ancillary Service is submitted in the HASP or Real-Time Market for Spinning Reserve and Non-Spinning Reserve with only a partial Energy Supply Bid for the AS capacity bid in, the CAISO will not generate or extend an Energy Supply Bid for the uncovered portions. For Generating Units with certified Regulation capacity, if there is no Bid for Regulation in the Real-Time Market, but there is a Day-Ahead award for Regulation Up or Regulation Down or a submission to self-provide Regulation Up or Regulation Down, respectively, the CAISO will generate a Regulation Up or Regulation Down Bid at the default Ancillary Service Bid price of $0 up to the certified Regulation capacity for the Generating Unit minus any Regulation awarded or self-provided in the Day-Ahead. If there is a Bid for Regulation Up or Regulation Down in the Real-Time Market, the CAISO will increase the respective Bid up to the certified Regulation capacity for the Generating Unit minus any Regulation awarded or self-provided in the Day-Ahead. If a Self-Schedule amount is greater than the Regulation Limit for Regulation Up, the Regulation Up Bid will be erased. Notwithstanding any of the

provisions of Section 30.7.6.1 set forth above, the CAISO will not insert or extend any Bid for Regulation Up or Regulation Down for a Use-Limited Resource of a Load following MSS Operator. The CAISO will not insert a Spinning Reserve and Non-Spinning Reserve Ancillary Service Bid at $0 in the Real-Time Market for any certified Operating Reserve capacity of a resource unless that resource submits an Energy Supply Bid but fails to submit an Ancillary Service Bid in the Real-Time Market.

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Attachment B – Marked Tariff

California Independent System Operator Corporation

Fifth Replacement FERC Electric Tariff

Energy Self-Schedule Requirement for Self-Provision of Regulation

May 3, 2011

ER11-___-000

30.5.2.6.1 Regulation Up or Regulation Down Bid Information

In the case of Regulation Up or Regulation Down, the Ancillary Services Bid or submission to self-provide must also contain: (a) the upward and downward range of generating capacity over which the resource is willing to provide Regulation within a range from a minimum of ten (10) minutes to a maximum of thirty (30) minutes; and (b) the Bid price of the capacity reservation, stated separately for Regulation Up and Regulation Down ($/MW). In the case of Regulation Up or Regulation Down from Dynamic System Resources, the Ancillary Services Bid must also contain the Contract Reference Number, if applicable. Ancillary Services Bids submitted to the Day-Ahead or Real-Time Market for Regulation need not be accompanied by an Energy Supply Bid that covers the Ancillary Services capacity being offered. ~~into the Real-Time Market.~~ A Regulation Down Bid will be erased unless there is an Energy Supply Bid or Energy Self-Schedule at a level that would permit the resource to provide Regulation Down to its lower Regulation Limit. A submission to self-provide Regulation Down will be erased unless there is an Energy Self-Schedule at a level that would permit the resource to provide Regulation Down to its lower Regulation Limit. A Regulation Up Bid will be erased unless there is an Energy Supply Bid or Energy Self-Schedule at a level that would permit the resource to provide Regulation Up within its Regulation Limit. A submission to self-provide Regulation Up will be erased unless there is an Energy Self-Schedule at a level that would permit the resource to provide Regulation Up within its Regulation Limit. ~~The resource's Energy Bid or Self-Schedule must allow for the resource to provide Regulation Down consistent with the capacity offered in the resource's Regulation Down Bid.~~

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30.7.6.1 Validation of Ancillary Services Bids

Throughout the validation process described in Section 30.7, the CAISO will verify that each Ancillary Services Bid conforms to the content, format and syntax specified for the relevant Ancillary Service. If the Ancillary Services Bid does not so conform, the CAISO will send a notification to the Scheduling Coordinator notifying the Scheduling Coordinator of the errors in the Bids as described in Section 30.7. When the Bids are submitted, a technical validation will be performed to verify that the bid quantity of Regulation, Spinning Reserve, or Non-Spinning Reserve does not exceed the certified Ancillary Services capacity for Regulation, or Operating Reserves on the Generating Units, System Units, Participating

Loads, Proxy Demand Resources, and external imports/exports bid. The Scheduling Coordinator will be notified within a reasonable time of any validation errors. For each error detected, an error message will be generated by the CAISO in the Scheduling Coordinator's notification screen, which will specify the nature of the error. The Scheduling Coordinator can then look at the notification messages to review the detailed list of errors, make changes, and resubmit if it is still within the CAISO's timing requirements. The Scheduling Coordinator is also notified of successful validation. If a resource is awarded or has qualified Self-Provided Ancillary Services in the Day-Ahead Market, the following rules will apply: (1): ~~,~~ if no Energy Self-Schedule is submitted to support a Submission to Self-Provide an Ancillary Service for Regulation, the Submission to Self-Provide an Ancillary Service will be invalidated; (2) if no Energy Supply Bid is submitted to cover the awarded or Self-Provided Ancillary Services for Spinning Reserve or Non-Spinning Reserve by the Market Close of HASP and the RTM, the CAISO will generate or extend an Energy Supply Bid as necessary to cover the awarded or Self-Provided Ancillary Services capacity using the registered values in the Master File and relevant fuel prices as described in the Business Practice Manuals for use in the HASP and IFM. ~~-~~If an AS Bid or Submission to Self-Provide an AS is submitted in the Real-Time Market for Spinning Reserve or Non-Spinning Reserve without an accompanying Energy Supply Bid at all, the AS Bid or Submission to Self-Provide an Ancillary Service will be erased. ~~-~~ If an AS Bid is submitted in the HASP or Real-Time Market for Spinning Reserve and Non-Spinning Reserve with only a partial Energy Supply Bid for the AS capacity, the CAISO will generate an Energy Supply Bid for the uncovered portions. ~~-~~ If a Submission to Self-Provide an Ancillary Service is submitted in the HASP or Real-Time Market for Spinning Reserve and Non-Spinning Reserve with only a partial Energy Supply Bid for the AS capacity bid in, the CAISO will not generate or extend an Energy Supply Bid for the uncovered portions. ~~-~~For Generating Units with certified Regulation capacity, if there is no Bid for Regulation in the Real-Time Market, but there is a Day-Ahead award for Regulation Up or Regulation Down or a submission to self-provide Regulation Up or Regulation Down, respectively, the CAISO will generate a Regulation Up or Regulation Down Bid at the default Ancillary Service Bid price of $0 up to the certified Regulation capacity for the Generating Unit minus any Regulation awarded or self-provided in the Day-Ahead. If there is a Bid for Regulation Up or Regulation Down in the Real-Time Market, the CAISO will increase the respective Bid up to the certified Regulation capacity for the Generating Unit minus any

Regulation awarded or self-provided in the Day-Ahead. If a Self-Schedule amount is greater than the Regulation Limit for Regulation Up, the Regulation Up Bid will be erased. Notwithstanding any of the provisions of Section 30.7.6.1 set forth above, the CAISO will not insert or extend any Bid for Regulation Up or Regulation Down for a Use-Limited Resource of a Load following MSS Operator. The CAISO will not insert a Spinning Reserve and Non-Spinning Reserve Ancillary Service Bid at $0 in the Real-Time Market for any certified Operating Reserve capacity of a resource unless that resource submits an Energy Supply Bid but fails to submit an Ancillary Service Bid in the Real-Time Market.

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Attachment C – Declaration of Khaled Abdul-Rahman

California Independent System Operator Corporation

Fifth Replacement FERC Electric Tariff

Energy Self-Schedule Requirement for Self-Provision of Regulation

May 3, 2011

ER11-___-000

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	**)**	**Docket No. ER11-____-000**

DECLARATION OF KHALED ABDUL-RAHMAN ON BEHALF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

I. Introduction

Q. Please state your name and business address.

A. My name is Khaled Abdul-Rahman. My business address is 250 Outcropping Way, Folsom, California 95630.

Q. By whom and in what capacity are you employed?

A. I am employed as Director, Power Systems Technology Development for the California Independent System Operator Corporation (ISO).

Q. Please describe your professional and educational background.

A. I received my Ph.D. in Power Systems in 1993 from the Illinois Institute of Technology (IIT), Chicago, IL. Since then, I have worked in the electric power system industry in the U.S. focusing primarily on large scale optimization software development, and deployment to production systems. My career includes working for different Energy Management System, electricity market, and information technology software vendors, and various consulting companies. In July 2009 I began work as the Principal for Power Systems Technology

Architecture and Development for the ISO, and in July 2010 I became the Director of the Power Systems Technology Development group at the ISO. My current responsibilities include design, implementation, testing, deployment, and analyzing results of all market applications for the ISO's day-ahead and real-time markets. I have worked on many projects requiring deep optimization knowledge and full understanding of market design rules.

Q. What is the purpose of your declaration in this proceeding?

A. The purpose of my declaration is to explain the detrimental effects to the ISO's day-ahead market that have resulted from the submission, in a few instances earlier this year, of economic bids for energy instead of energy self-schedules in conjunction with submissions to self-provide an ancillary service for regulation. I will first provide an overview of the ISO's current requirements applicable to ancillary services bids and to submissions to self-provide an ancillary service for the ancillary service of regulation. I will then explain why the submission of economic energy bids along with a submission to self-provide regulation causes unnecessary performance problems in reaching a solution in a timely manner in the ISO's day-ahead market.

II. Requirements for Ancillary Services Bids for Regulation and Submissions to Self-Provide an Ancillary Service for Regulation

Q. Please briefly describe the features of ancillary services bids in the ISO's markets.

A. Ancillary services bids may be submitted in the ISO markets to provide a variety of ancillary services, including spinning reserve, non-spinning reserve, and regulation (*i.e.*, regulation up or regulation down). Ancillary services bids include both quantity and price amounts.

Q. Please explain how ISO scheduling coordinators may self-provide ancillary services.

A. Scheduling coordinators may self-provide ancillary services by making a submission to self-provide an ancillary service and having that submission accepted by the ISO. A submission to self-provide an ancillary service is defined as a submission to the ISO containing all of the bidding requirements for an ancillary service with the exception of price information. A submission to self-provide regulation is treated as a self-commitment to PMin of the resource in the ISO's software because the resource has to be online to provide regulation services.

Q. Does the ISO require scheduling coordinators to submit energy bids in conjunction with submissions to self-provide ancillary services?

A. Yes. However, currently the ISO tariff does not clearly specify whether such bids must be in the form of a self-schedule for energy or an economic energy bid (also

known as an energy supply bid). Nor does the tariff distinguish clearly between energy bid requirements for operating reserve (spinning and non-spinning reserve) and regulation. Nevertheless, because submissions to self-provide regulation are considered self-commitments, the ISO expects scheduling coordinators to self-schedule the committed resources at a level that will allow the resources to provide the submitted self-provided regulation up or regulation down capacity. For example, a resource self-providing regulation down must be self-scheduled at least at an energy level that will allow the provision of regulation down within the resource's regulation down range. For self-provision of regulation up, if the regulation range is above PMin, the resource must submit a self-schedule at an energy level within the resource's regulation range that will accommodate its self-provision of regulation up at the level submitted.

III. Effects of Submissions to Self-Provide an Ancillary Service for Regulation that Have Included Economic Bids for Energy Rather than Energy Self-Schedules

Q. Have scheduling coordinators making submissions to self-provide regulation always included energy self-schedules with those submissions?

A. In the vast majority of cases, scheduling coordinators making submissions to self-provide an ancillary service for regulation have included feasible energy self-schedules to permit the provision of regulation up or regulation down consistent with their submissions. In few instances that occurred earlier this year, however, a scheduling coordinator seeking to self-provide regulation instead submitted economic bids for energy in conjunction with its submissions to self-provide.

Q. What has happened when submissions to self-provide an ancillary service for regulation have included economic bids for energy rather than energy self-schedules?

A. During the second half of January 2011, and after implementation of convergence bidding on February 1, 2011, the ISO experienced three occasions of serious degradation in the performance of its day-ahead market, each of which caused a delay of approximately an hour in reaching a solution in the day-ahead market, which resulted in the ISO not meeting its normal publishing time for day-ahead market awards. On each occasion, this one-hour delay was comprised of an approximately 45-minute delay in running the Market Power Mitigation-Reliability Requirement Determination portion of the day-ahead market and a 15-minute delay in conducting the Integrated Forward Market pricing run. There were also about eleven occasions in January and February of 2011 where less serious delays resulted in the ISO publishing the day-ahead market runs very close to 1:00 PM (the normal publishing deadline). On these occasions, although the market published on-time, the ISO's operators had no time to review any results and no time to re-run one or more of the day-ahead market applications even assuming they had had the time to review the results and identified an operational need to re-run the market. Obviously, had the operators taken the time to review the results and also needed to re-run the market, the publishing deadline would have definitely been missed.

Q. Was the ISO able to determine the cause of these performance degradations?

A. Yes. An ISO investigation determined that the root cause of these sudden performance degradations was the submission of economic bids for energy, instead of energy self-schedules, in conjunction with submissions to self-provide regulation. By the first week of March 2011, the ISO and its market applications vendor had performed extensive offline analysis of the various cases where performance degradation was observed. This analysis revealed that the submission of economic bids instead of self-schedules in these cases was the major source of the noticeable increase in solution time, due to the excess time required to perform computations inside the optimization algorithm to check for unfeasible solutions or solutions that do not improve the objective function cost while honoring the self-provision of regulation for the subject resource. As part of this offline analysis, the ISO re-ran all of these cases with energy self-schedules sufficient to support the self-provision amount, instead of economic bids. In these scenarios, the market software performed normally: namely, it reached a solution within the normal timeframe for the ISO to publish its day-ahead results while also allowing for operators to review the market results of the applications and, if needed, to re-run the applications while still publishing by 1:00 PM.

Q. Did the ISO reach any other conclusions as the result of its analysis?

A. Yes. Another conclusion that the ISO reached through its offline analysis is that it only requires one submission of an economic bid instead of a self-schedule by a unit submitting to self-provide regulation to trigger the degradation in software performance that I have outlined. In general, the absence of a self-schedule to cover the amount of self-provided regulation reflects itself in a longer time to achieve the same solution quality within the normal thresholds the ISO uses. Indeed, all it took in all three cases in January and February, when the ISO missed publishing its day-ahead market on-time, was for one scheduling coordinator to submit an economic bid in conjunction with a submission to self-provide regulation. With the summer season fast approaching, the ISO's goal is to maximize the availability of resources in its market, and the regulation commodity is particularly needed from all available resources.

Q. Would performance degradations have occurred if the submissions to self-provide an ancillary service for regulation had included energy self-schedules instead of economic bids for energy?

A. No. As I explained above, the ISO re-ran the market in an offline application, substituting energy self-schedules for economic bids during the affected periods, and the market solved normally. Accordingly, if all submissions to self-provide regulation had included energy self-schedules with those submissions instead of economic energy bids, the root cause of the performance degradation would have been eliminated. Therefore, the ISO would have been able to achieve a

market solution within the normal timeframe during the entirety of the time period from January 2011 onward.

Q. Why is it important to the ISO to avoid these types of delays?

A. First, by reaching a market solution in a timely fashion, the ISO can publish those results as soon as possible prior to the close of the market, which provides market participants with valuable information. In addition, the ISO may need to re-run market applications one or more times if the operator recognizes data anomalies or inaccurate outage definition or derate information. Delays in reaching a market solution deprive operators of the ability to re-run the software and still meet the market timeline. Finally, if a serious enough delay occurs such that the ISO cannot reach a solution at all within the market timeline, ISO operators need to manually intervene by removing problematic bids or taking other action to ensure that the market can solve. To the extent that this requires the ISO to delete submissions to self-provide regulation, the ISO then needs to procure additional regulation in the real-time markets, increasing the risk that necessary regulation might not be obtained and potentially resulting in higher costs to customers.

Q. Does this conclude your declaration?

A. Yes.

I declare that this declaration is true and correct to the best of my knowledge and that this declaration was executed in Folsom, California on May 3, 2011.

Khaled Abdul-Rahman