



November 24, 2009

***Via Overnight Delivery***

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. ER10-\_\_\_\_-000**

**Amendment to Eligible Intermittent Resource Provisions of the ISO  
Tariff**

Dear Secretary Bose:

The California Independent System Operator Corporation (“ISO”) submits for Commission approval amendments to its tariff to expand the scope of the data it receives from “Eligible Intermittent Resources,” which are defined in the ISO tariff to include generating units powered primarily by (1) wind, (2) solar energy, or (3) hydroelectric potential derived from small conduit water distribution facilities that do not have storage capability.<sup>1</sup>

The ISO anticipates a significant increase in reliance on wind and solar generating facilities, which are expected to comprise the majority of Eligible Intermittent Resources, to satisfy California’s future demand for electrical energy. The variability and uncertainty of energy output from these types of renewable resources poses challenges to reliable system operation. The variability is due to fluctuations in the output of these resources in accordance with the changing availability of their primary fuel source, and the uncertainty results from the difficulty in predict the timing of the variation in output. Thus, even with perfect foresight, system operators would still have to account for variability of wind and solar resources in the absence of storage mechanisms.

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<sup>1</sup> The ISO (which is sometimes also referred to as the CAISO) submits this filing pursuant to Section 205 of the Federal Power Act, 16 U.S.C. § 824d, and Section 35.13 of the Commission’s regulations, 18 C.F.R. § 35.13. Capitalized terms not otherwise defined herein have the meanings set forth in Appendix A to the ISO tariff.

An improvement in the ISO's ability to accurately forecast production from wind and solar resources constitutes a critical means to mitigate the operational impacts of variability and uncertainty. ISO experience gained through administration of the Participating Intermittent Resource program ("PIRP") demonstrates that poor data quality significantly undermines forecasting accuracy. Accordingly, enhancing data quality is fundamental to achieving the objective of better intermittent resource forecasts.

To improve data quality received from all intermittent resources, the ISO proposes tariff revisions to expand the scope of its data requirements in two primary ways:

- Extending the scope of resources subject to the obligation to install specified forecasting and telemetry equipment and to communicate relevant data to the ISO to include all Eligible Intermittent Resources, and
- Reducing the threshold for reporting a forced outage of an Eligible Intermittent Resource with total capacity of greater than 10 MW from the current outage capacity level of 10 MW to one MW.

As explained in more detail below, these additional requirements are important to maintaining the reliability of the ISO's operations while imposing only a small incremental burden on operators of wind and solar resources.

## **I. Background**

The proposed tariff amendments, and associated modifications that the ISO is proposing to its Business Practice Manuals, are the result of many months of effort on the part of stakeholders and the ISO. From November 2008 through October 2009, the ISO and stakeholders engaged in extensive discussions on the ISO's additional needs for data from intermittent resources and related issues regarding technical standards for equipment to provide such data. The stakeholder process during that span of time included participation by renewable resource developers, load-serving entities, and conventional generators as well as by representatives of forecast service providers and academics investigating innovations in forecasting practices.<sup>2</sup>

The final proposal for tariff revisions regarding Eligible Intermittent Resources was presented to and approved by the ISO Board of Governors ("Board") at its meeting on October 29, 2009. The materials the ISO provided to the Board before the meeting included a memorandum entitled "Decision on Outage and Forecasting Modifications for Eligible Intermittent Resources"

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<sup>2</sup> Materials related to the Eligible Intermittent Resource stakeholder process are posted on the ISO's website at <http://www.caiso.com/1817/181783ae9a90.html>.

("Board Memorandum"), as well as a timeline summarizing key dates and activities in the stakeholder process and a matrix of stakeholder comments and ISO responses.<sup>3</sup>

## II. Proposed Tariff Changes

In order to improve the quality of data received from intermittent resources and thereby support more accurate forecasts, the ISO proposes the following primary two sets of changes to its tariff:

- The ISO proposes to expand the scope of resources subject to the obligation to install specified forecasting and telemetry equipment and to communicate relevant data to the ISO. Currently, the obligation applies only to Participating Intermittent Resources.<sup>4</sup> The ISO proposes to extend the obligation to all interconnecting Eligible Intermittent Resources that have executed a participating generator agreement ("PGA") or a qualifying facility participating generator agreement ("QF PGA"), unless otherwise exempt as discussed further below.
- The ISO proposes to reduce the threshold for reporting a forced outage of an Eligible Intermittent Resource with total capacity of greater than 10 MW from the current outage capacity level of 10 MW to one MW, unless otherwise exempt as discussed further below. Thus, Eligible Intermittent Resources with total capacity less than 10 MW will not have a forced outage reporting requirement, but Eligible Intermittent Resources with total capacity greater than 10 MW must report forced outages impacting one MW or more of their capacity. This new requirement will apply to all Eligible Intermittent Resources greater than 10 MW that have executed a PGA or QF PGA. The ISO is not proposing to change the obligation imposed on all generating units, including Eligible Intermittent Resources, to submit a more detailed report *explaining* any forced outages of 40 MW or more.

The first modification ensures that the ISO will have access to the data necessary to forecast the expected output from resources with intermittent production whether or not a resource participates in PIRP. As a result, the ISO will not be unduly limited by commercial considerations involved in PIRP participation and will be able to gain an appropriate level of visibility over intermittent resources necessary to maintain reliability and operate efficient markets. The second modification eliminates a significant source of forecasting

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<sup>3</sup> The materials presented to the Board for its review at the October 29 meeting are available on the ISO's website at <http://www.caiso.com/244e/244e8eae13040.html>.

<sup>4</sup> A Participating Intermittent Resource is an Eligible Intermittent Resource that meets certain requirements and elects to schedule in accordance with the scheduling requirements of the Participating Intermittent Resource program. (ISO Tariff § 4.8 and Appendix Q.)

error by ensuring the ISO will have accurate information regarding the capacity actually available to produce electricity during the time frame of the operational forecasts.

**A. Expansion of Applicability of the Forecasting Equipment Installation and Data Communication Requirements**

The ISO anticipates that most, if not all, new intermittent wind and solar capacity will elect to become a Participating Intermittent Resource. Nevertheless, the ISO believes that, even if a particular intermittent resource decides not to participate in PIRP, the resource should communicate vital forecasting data to the ISO for use in maintaining reliable and efficient operations. Utilities will need to access approximately 8,000 MW of additional renewable resource capacity in order to achieve California's 20% renewable portfolio standard goal. Significantly more renewable resources will be needed to achieve a 33% renewable portfolio standard. If the ISO lacks visibility regarding the anticipated production from this large amount of intermittent resources, the ISO will face an unacceptable risk to reliability and the functioning of its markets.

The ISO, therefore, is proposing that all Eligible Intermittent Resources that are subject to a PGA or QF PGA be required to meet the forecasting data gathering and communication requirements of the Eligible Intermittent Resource Protocol (EIRP), Appendix Q of the ISO tariff, subject to certain exemptions that the ISO proposes to incorporate in pending changes to the ISO's Business Practice Manual for Market Operations.<sup>5</sup> In that regard, wind facilities with existing or approved meteorological station tower configurations as of the effective date of the proposed tariff change would not be compelled to alter those configurations. Similarly, those wind resources without an installed nacelle anemometer as of the effective date of the proposed tariff changes would not be obligated to retrofit. In addition, small conduit hydro facilities would also not be obligated to provide additional forecasting data, at least until such time as the ISO elects to adopt a forecasting program for this specific type of Eligible Intermittent Resource.

The ISO is incorporating the forecasting equipment and communication data obligation into the Eligible Intermittent Resource Protocol. Under the existing EIRP, only an Eligible Intermittent Resource that elects to become a Participating Intermittent Resource must be certified, and this imposes the various forecasting and communication requirements on the resource. This would change under the modifications proposed by the ISO. All Eligible Intermittent Resources, regardless of whether they are certified as a Participating Intermittent Resource, and unless otherwise exempt, would be subject to the substantive forecasting equipment and data provisions of the EIRP. However,

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<sup>5</sup> Changes to the ISO's Business Practice Manuals are a subject to the change management provisions of tariff section 22.11.

some sections of the EIRP, such as those relating to scheduling and settlements, and to PIRP monitoring would not apply unless the Eligible Intermittent Resource elected to be certified as a Participating Intermittent Resource.

The ISO, working with stakeholders, also has refined the requirements for the forecasting and communications equipment applicable to wind and solar resources, respectively. No additional tariff changes are required to implement these new requirements, other than those already discussed. The existing Eligible Intermittent Resource Protocol currently imposes a general obligation on Participating Intermittent Resources to comply with forecasting protocols and equipment requirements that the ISO may specify though posting on the ISO website. As noted above, the proposed tariff changes simply are intended to expand that obligation to all interconnecting Eligible Intermittent Resources. Given the existing tariff authority to identify requirements, refinements to the forecasting and communication equipment specifications will not be expressly included in the tariff changes. Instead, they will be appropriately incorporated into a Business Practice Manual in accordance with accepted ISO practice, and the ISO is proposing additional tariff revisions in this filing to ensure that the BPM process is used for these purposes. As such, the forecasting and communication equipment requirements will be reviewed by the ISO's management and are potentially subject to review by the ISO Board of Governors as part of the BPM change management process. As noted, a management proposal to revise the BPM for Market Operations is pending.<sup>6</sup>

## **B. Lowering of Forced Outage Threshold Requirements**

Section 9.3.10 of the ISO tariff governs the reporting of forced outages. That section requires the operator of a generating unit to report an unanticipated forced outage that reduces the capability of the generating unit by the greater of 10 MW or 5% of the generating unit's maximum value, to the extent the forced outage lasts longer than 15 minutes. In addition, where the operator has to remove from service, or reduce the output capability of, a generating unit by 10 MW or more to prevent a likely forced outage within the next twenty-four hour period, the operator must similarly notify the ISO. The ISO believes that, given the significant variability of intermittent resource production and the expected significant increase in the amount of intermittent resource capacity that will be interconnected to the grid in the future, a 10 MW threshold for triggering the outage reporting obligation conflicts with the goal of reliable and efficient grid operations.

Forecast service providers must have accurate information on the output capability of Eligible Intermittent Resources in order to provide accurate energy

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<sup>6</sup> The ISO's BPM proposed revision request to implement the revision to these forecasting requirements and to implement other aspects of the current and proposed requirements for Eligible Intermittent Resources will be posted on the ISO's website at <https://bpm.caiso.com/bpm/prr/list>.

forecasts. Their forecasting algorithms must accurately reflect the Eligible Intermittent Resource's characteristics. Unknown changes to the Eligible Intermittent Resource's energy availability will affect the forecast. Accordingly, the absence of an obligation to report forced outages of less than 10 MW may lead to significant errors in forecasting the production of Eligible Intermittent Resources.

In order to address this situation, the ISO proposes to alter the reporting threshold for forced outages from 10 MW to one MW for those Eligible Intermittent Resources with total capacity greater than 10 MW. Small Eligible Intermittent Resources with less than 10 MW of total capability and Eligible Intermittent Resources that are not wind or solar resources will be exempt from the forced outage reporting requirements. Additionally, the obligation will apply on a generating facility, not a generating unit, basis. This change accounts for the fact that many Eligible Intermittent Resources may be composed of many small or modular generating units that individually are less than 1 MW in size. Consequently, under the prior language such Eligible Intermittent Resources would fall outside the express scope of the reporting obligation. The forced outage reporting requirements for all conventional, *i.e.*, non-Eligible Intermittent Resource, generating units will remain unchanged.

### **C. Stakeholder Concerns Regarding the Proposed Tariff Revisions**

Each proposed tariff modification elicited one primary concern from stakeholders. On balance, the ISO considers the scope and purpose of these proposed tariff revisions to outweigh the concerns expressed. Nevertheless, the ISO has modified its proposal in an effort to address the most significant of the stakeholder concerns.

#### **1. Application of the Forecast Fee to Eligible Intermittent Resources**

With respect to the expansion of the forecasting equipment and communications requirements, the ISO proposes to charge all Eligible Intermittent Resources the forecast fee currently assessed only to Participating Intermittent Resources. The ISO levies a forecast fee in order to pay the costs of the ISO's forecasting service provider. Stakeholders raised concerns regarding the application of the forecast fee to those Eligible Intermittent Resources that do not voluntarily choose to participate in the Participating Intermittent Resource program and as such do not receive PIRP's benefits. The tariff currently provides that the ISO may assess a charge up to \$0.10 per MWh on the metered energy from Participating Intermittent Resources as a forecast fee. However, the amount of the forecast fee is limited to the level necessary for the ISO to recover its projected annual costs related to developing energy forecasting systems,

generating forecasts, validating forecasts, and monitoring forecast performance for the Participating Intermittent Resource program. To determine the current forecast fee, the aggregate program costs incurred by the ISO are divided by the projected annual energy production of all Participating Intermittent Resources.

Several factors support the ISO's proposal. First, the burden on reliable system operational that results from variable output is unaffected by the resource's decision whether or not to become a Participating Intermittent Resource. The ISO's need for visibility and accurate forecasting is triggered by the intermittent resource's choice to interconnect to the ISO's balancing authority area. Given this direct causation, the ISO believes it is appropriate to apply the forecast fee to all Eligible Intermittent Resources, rather than manage this reliability impact through the ISO's operating budget as it does, for instance, for load variability. Second, over time the per MWh charge will drop significantly as more energy is produced, not just from Participating Intermittent Resources, but also from other Eligible Intermittent Resources. This mitigates the expected financial impact of the proposal. Accordingly, this fact, along with the potential impacts of new intermittent resources on reliability and operational efficiency, justifies the extension of the forecast fee to all Eligible Intermittent Resources.

Nevertheless, the ISO recognizes that there is a possibility that very small resources and small conduit hydroelectric resources, not currently subject to the forecasting regime, could be overburdened by the forecast fee. In an effort to address the concerns of stakeholders regarding this possibility, and recognizing that such resources are likely to have only a minimal impact on reliability, the ISO has incorporated a provision into Appendix F, Schedule 4 of the tariff granting it the authority to establish exemptions from the forecast fee through a Business Practice Manual.

In conjunction with this expansion of the applicability of the forecast fee, the ISO is also taking this opportunity to move the provisions specifying the formula for determining the rate for the forecast fee from Section 2.4.1 of the EIRP to Appendix F, Schedule 4 of the tariff, where the other details regarding fees applicable to Participating Intermittent Resources and Eligible Intermittent Resources are set forth. As part of this non-substantive consolidation of these fee-related provisions in Appendix F, Schedule 4, the ISO has also clarified the transferred provisions to emphasize that the provisions regarding the forecast fee constitute a formula rate subject to a tariff-specified rate cap. Given the formula nature of the rate for the forecast fee, the ISO goes on to specify that the effective rate will be specified in the applicable Business Practice Manual and that any changes to the forecast fee rate will be subject to review for consistency with the tariff-specified formula through the BPM change management process.

## **2. Lowering the Forced Outage Reporting Threshold for Eligible Intermittent Resources**

Several stakeholders also opposed lowering the forced outage reporting threshold to one MW for Eligible Intermittent Resources. Instead, several stakeholders felt that a 10 MW threshold was more reasonable. The ISO declined to alter its position for several reasons. First, the stakeholder position is, in large part, based on a misunderstanding of the reporting burden, which is minimal. The scheduling and logging system for the ISO ("SLIC") allows for the automated reporting of forced outages. Second, setting a 10 MW threshold could exclude small-scale photovoltaic resources. However, given the potential proliferation of such resources and the significant aggregate capacity such resources will have, the ISO must maintain sufficient visibility as to the production capabilities of such resources to maintain reliable and efficient grid operations. Third, given the inherent variability of fuel-constrained renewable resources, the ISO anticipates incorporating forecasts of their output into market commitment and dispatch systems. As a consequence, greater precision and greater accuracy in the forecasts will promote more efficient market outcomes.

Nevertheless, again in an effort to respond to the concerns of stakeholders that very small resources and small conduit hydroelectric resources could be overburdened by these additional forced outage reporting requirements and have little potential to contribute to reliability problems, the ISO has incorporated into the revisions to tariff Sections 9.3.10.3 and 9.3.10.3.1 provisions granting it the authority to establish exemptions from the reporting requirements through a Business Practice Manual.

Also in response to comments from stakeholders, the ISO has incorporated into Sections 9.3.10.3 and 9.3.10.3.1 provisions limiting the exposure of any affected Eligible Intermittent Resource to potential sanctions for violations of the ISO's rules of conduct that could otherwise apply pursuant to tariff Section 37.4 as a result of failure to comply with these additional forced outage reporting requirements. The ISO considers it fair that these additional reporting requirements, which apply to generating facilities largely comprised of small, geographically diverse generating units and extend beyond those applicable to other types of resources, should not be subject to the full extent of sanctions that apply to failure to comply with ordinary reporting requirements.

### **D. Other Tariff Changes**

In addition to the tariff changes described above, the ISO proposes the following related changes to the tariff provisions regarding Eligible Intermittent Resources:

- The definition of an Eligible Intermittent Resource is revised to establish a minimum capacity of 1 MW for a resource to be classified as an Eligible Intermittent Resource. This is consistent with the 1 MW minimum for a resource to be subject to the tariff requirements regarding participating generators, and ensures that very small resources will not be subject to the requirements of the proposed tariff revisions.
- Several tariff provisions are revised to specify that additional implementing provisions will be specified in a Business Practice Manual, rather than simply posted on the ISO's website as currently specified in the tariff. This provides interested parties a more formal process for reviewing and providing input to these additional implementing provisions. The revised provisions are the definition of Participating Intermittent Resource and Sections 2.2.1, 2.2.5, 2.4.1, 4, 5.3.6, 6.1, and 6.2 of the EIRP in Appendix Q.
- A few provisions are revised in the Eligible Intermittent Resources Protocol to correct minor typographical errors and provide minor clarifications. The provisions of the EIRP in Appendix Q to which these minor revisions have been made are Sections 2.2.4, 4.1, 5.1, 5.2, 5.3.2, 5.3.4, and 7.

### **III. Effective Date**

The ISO requests that the Commission make all of the tariff revisions contained in the instant filing effective as of February 1, 2010. This requested effective date is the first day of the month more than 61 days following the date of this filing and will permit the ISO to implement the requested changes in a manner that is best accommodated by its systems, while providing the ISO some time to account for any changes the Commission may order to the proposed tariff revisions. The Commission should grant the ISO's requested February 1, 2010 effective date for this reason.

### **IV. Communications**

Communications regarding this filing should be addressed to the following individuals, whose names should be placed on the official service list for this proceeding:

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

## **V. 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 Agreements under the ISO tariff. In addition, the ISO is posting this transmittal letter and all attachments on its website.

An additional copy of this filing is enclosed to be date-stamped and returned in the enclosed, pre-paid Federal Express envelope. If there are any questions concerning this filing, please contact the undersigned

## **VI. 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.               |

**VII. Conclusion**

For the foregoing reasons, the Commission should accept the proposed tariff changes contained in the instant filing to become effective on February 1, 2010. Please contact the undersigned if you have any questions regarding this matter.

Respectfully submitted,

A handwritten signature in blue ink that reads "Michael D. Dozier". The signature is written in a cursive style and is positioned above a horizontal line.

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**Attachment A – Clean Sheets**  
**Eligible Intermittent Resource Amendment**  
**Fourth Replacement CAISO Tariff**  
**November 25, 2009**

**9.3.10.2** Each Participating TO shall report any change or potential change in equipment status of the Participating TO's transmission assets turned over to the control of the CAISO or in equipment that affects transmission assets turned over to the control of the CAISO immediately upon discovery to the CAISO (this will include line and station equipment, line protection, Remedial Action Schemes and communication problems, etc.). Each Participating TO shall also keep the CAISO immediately informed upon discovery as to any change or potential change in the Participating TO's transmission system that could affect the reliability of the CAISO Controlled Grid. This would include, but is not limited to, adverse weather conditions, fires, bomb threats, system failures, etc. To the extent possible, the CAISO shall reflect all transmission Outages in the Integrated Forward Market, HASP, and Real-Time Market.

**9.3.10.3** The following requirements apply to the advance reporting to the CAISO of anticipated and actual Forced Outages:

- (a) Any Operator, upon identification of a situation likely to result in a Forced Outage within the next twenty-four (24) hours unless immediate corrective action is taken, where such action requires the removing from service or reducing the maximum output capability of a Generating Unit or a Resource-Specific System Resource by ten (10) MW or more from the value most recently recorded in SLIC, or removing a transmission facility from service, shall communicate directly with the CAISO Control Center.

- (b) Notwithstanding Section 9.3.10.3(a), and unless otherwise exempted pursuant to the terms of a Business Practice Manual, the Operator of an Eligible Intermittent Resource with a PMax of greater than ten (10) MW for its entire generating facility, upon identification of a situation likely to result in a Forced Outage within the next twenty-four (24) hours unless immediate corrective action is taken, where such action requires the removing from service or reducing the maximum output capability of the Eligible Intermittent Resource generating facility by one (1) MW or more from the value most recently recorded in SLIC, shall communicate directly with the CAISO Control Center. The failure of the Operator of the Eligible Intermittent Resource to report a Forced Outage between one (1) MW and ten (10) MW in accordance with this Section 9.3.10.3(b) shall be subject only to the provisions of Section 37.4.1.2(a) and (b)(1) of Section 37.4.1.2.

All notifications of Forced Outages shall be communicated to the CAISO Control Center with as much notice as possible in order that the necessary security analysis and CAISO Controlled Grid assessments may be performed. If prior notice of a Forced Outage cannot be given, the Operator shall notify the CAISO of the Forced Outage within thirty (30) minutes after it occurs. Any Operator, upon identification of a situation likely to result in a Forced Outage but of a nature not requiring a removal from service until some time more than twenty-four (24) hours in the future will be subject to the provisions of Section 9 with respect to any necessary Outage except the requirements imposing time limits for notification will be waived and the request will be expedited by the CAISO provided notice is given as soon as possible.

**9.3.10.3.1** The following requirements apply if prior notice of a Forced Outage cannot be given to the CAISO:

- (a) The Operator of a Generating Unit or a Resource-Specific System Resource is required to notify the CAISO within sixty (60) minutes after discovering any change in the maximum output capability of at least ten (10) MW or five percent (5%) of the value registered in the Master File, whichever is greater, from the value registered in SLIC that lasts for fifteen (15) minutes or longer.
- (b) Notwithstanding Section 9.3.10.3.1(a), and unless otherwise exempted pursuant to the terms of a Business Practice Manual, the Operator of an Eligible Intermittent Resource with a PMax of greater than ten (10) MW for its entire generating facility is required to notify the CAISO within sixty (60) minutes after discovering any change in the maximum output capability of the generating facility of at least one (1) MW from the value registered in SLIC that lasts for fifteen (15) minutes or longer. The failure of the Operator of the Eligible Intermittent Resource to report a Forced Outage between one (1) MW and ten (10) MW in accordance with this Section 9.3.10.3.1(b) shall be subject only to the provisions of Section 37.4.1.2(a) and (b)(1) of Section 37.4.1.2.

**9.3.10.4** The CAISO Control Center shall coordinate any operational changes necessary to accommodate a Forced Outage and Market Participants shall comply with the CAISO's instructions given for that purpose.

**9.3.10.5** All Forced Outages shall be communicated by the CAISO Control Center to Operators likely to be affected by the Outage using the same procedures adopted for Maintenance Outage coordination procedures.

**9.3.10.6** With respect to Forced Outages of Generating Units that result in a reduction in maximum output capability that lasts fifteen (15) minutes or longer of 40 MW or more below the value registered in the Master File and ten percent (10%) of the value registered in the Master File, the Operator shall provide to the CAISO an explanation of the Forced Outage and the estimated return time, within two (2) Business Days after the Operator initially notifies the CAISO pursuant to Section 9.3.10.2.1 of the change in maximum output capability. The explanation shall include a description of the equipment failure or other cause and a description of all remedial actions taken by the Operator. Upon request of the CAISO, Operators, and where applicable, Eligible Customers, Scheduling Coordinators, UDCs and MSS Operators promptly shall provide information requested by the CAISO to enable the CAISO to review the changes made to the maximum output capability or to provide further information relative to the explanation of the Forced Outages submitted by the Operator and to prepare reports on Forced Outages. If the CAISO determines that any Forced Outage may have been the result of gaming or other questionable behavior by the Operator, the CAISO shall submit a report describing the basis for its

account at the end of each month shall be netted against the aggregate payments (charges) by Scheduling Coordinators on behalf of Participating Intermittent Resources. The resulting balance shall be assigned to each Scheduling Coordinator in the same proportion that such Scheduling Coordinator's aggregate Net Negative Uninstructed Deviations in that month bears to the aggregate Net Negative Uninstructed Deviations for all Scheduling Coordinators in the CAISO Balancing Authority Area in that month.

**11.12.3 Payment of Eligible and Participating Intermittent Resource Fees.**

**11.12.3.1 Forecasting Fee.**

A fee to defray the costs of the implementation of the forecasting service for Eligible Intermittent Resources shall be assessed to Scheduling Coordinators for Eligible Intermittent Resources as specified in Schedule 4 of Appendix F.

**11.12.3.2 Process Fee.**

A fee to defray the costs of processing the Participating Intermittent Resource Export Fee will be levied as specified in Schedule 4 of Appendix F.

**11.12.3.3 Participating Intermittent Resource Export Fee.**

A Participating Intermittent Resource Export Fee will be levied in accordance with Section 5.3 of Appendix Q and Schedule 4 of Appendix F.

**11.12.4 Price for Uninstructed Deviations for Participating Intermittent Resources.**

Uninstructed Deviations associated with each Participating Intermittent Resource in a Scheduling Coordinator's portfolio shall be settled as provided in Section 34.19.2.5 at the monthly weighted average Dispatch Interval LMP, where the weights are the metered Generation quantities associated with each Dispatch Interval LMP.

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|---------------------------------------|--|
| <b>Electric Facility</b>              | An electric resource, including a Generating Unit, System Unit, or a Participating Load.   |
| <b>Eligible Capacity</b>              | Capacity of Generating Units, System Units, System Resources, or Participating Load that is not already under a contract to be a Resource Adequacy Resource, is not under an RMR Contract or is not currently designated as ICPM Capacity that effectively resolves a procurement shortfall or reliability concern and thus is eligible to be designated under the ICPM in accordance with Section 43.1.   |
| <b>Eligible Customer</b>              | (i) any utility (including Participating TOs, Market Participants and any power marketer), Federal power marketing agency, or any person generating Energy for sale or resale; Energy sold or produced by such entity may be Energy produced in the United States, Canada or Mexico; however, such entity is not eligible for transmission service that would be prohibited by Section 212(h)(2) of the Federal Power Act; and (ii) any retail customer taking unbundled transmission service pursuant to a state retail access program or pursuant to a voluntary offer of unbundled retail transmission service by the Participating TO. |
| <b>Eligible Intermittent Resource</b> | A Generating Unit 1 MW or larger that is powered by one of the following sources, except for a de minimis amount of Energy from other sources: 1) wind, 2) solar energy, or 3) hydroelectric potential derived from small conduit water distribution facilities that do not have storage capability.   |
| <b>ELS Resource</b>                   | Extremely Long-Start Resource  |
| <b>Emissions Cost Demand</b>          | The level of Demand specified in Section 11.18.3.  |
| <b>Emissions Cost Invoice</b>         | The invoice submitted to the CAISO in accordance with Section 11.18.6.   |
| <b>Emissions Costs</b>                | The mitigation fees, excluding capital costs, assessed against a Generating Unit by a state or federal agency, including air quality districts, for exceeding applicable NOx emission limitations.   |
| <b>Emissions Eligible Generator</b>   | A Generator with a Generating Unit that is a BCR Eligible Resource.  |
| <b>EMS</b>                            | Energy Management System   |

|                                   |   |
|-----------------------------------|---|
| <b>Fixed CRRs</b>                 | Congestion Revenue Rights that are used in the running of an SFT to represent known encumbrances on the transmission system and which may include some or all of the following: previously allocated or awarded Monthly CRRs, Seasonal CRRs, Long Term CRRs, and Merchant Transmission CRRs, Existing Transmission Contracts, and Converted Rights.   |
| <b>FNM</b>                        | Full Network Model  |
| <b>Forbidden Operating Region</b> | A pair of lower and higher operating levels between which a resource cannot operate stably. The Forbidden Operating Regions lie between a resource's Minimum Operating Limit and Maximum Operating Limit and cannot overlap.  |
| <b>Forced Outage</b>              | An Outage for which sufficient notice cannot be given to allow the Outage to be factored into the Day-Ahead Market, HASP or RTM bidding processes.  |
| <b>Forecast Fee</b>               | The charge imposed on an Eligible Intermittent Resource pursuant to the terms of Appendix F, Schedule 4.  |
| <b>Forward Scheduling Charge</b>  | The component of the Grid Management Charge that provides for the recovery of the CAISO's costs, including, but not limited to the costs of providing the ability to Scheduling Coordinators to submit a Bid for Energy and Ancillary Services and the cost of processing accepted Ancillary Services Bids. The formula for determining the Forward Scheduling Charge is set forth in Appendix F, Schedule 1, Part A. |

|   |  |
|---|--|
| <b>Participating Generator Agreement (PGA)</b>                    | An agreement between the CAISO and a Participating Generator, a <i>pro forma</i> version of which is set forth in Appendix B.2.  |
| <b>Participating Intermittent Resource</b>                        | One or more Eligible Intermittent Resources that meets the requirements of the technical standards for Participating Intermittent Resources adopted by the CAISO and set forth in a Business Practice Manual.  |
| <b>Participating Intermittent Resource Export Fee</b>             | Fee based on Schedule 4 of Appendix F and Section 5.3 of Appendix Q.   |
| <b>Participating Intermittent Resource Fees</b>                   | Fees set forth in Section 11.12.3.   |
| <b>Participating Load</b>   | An entity, including an entity with Pumping Load or Aggregated Participating Load, providing Curtailable Demand, which has undertaken in writing by execution of a Participating Load Agreement to comply with all applicable provisions of the CAISO Tariff.  |
| <b>Participating Load Agreement (PLA)</b>                         | An agreement between the CAISO and a Participating Load, a <i>pro forma</i> version of which is set forth in Appendix B.4.   |
| <b>Participating TO or Participating Transmission Owner (PTO)</b> | A party to the Transmission Control Agreement whose application under Section 2.2 of the Transmission Control Agreement has been accepted and who has placed its transmission assets and Entitlements under the CAISO's Operational Control in accordance with the Transmission Control Agreement. A Participating TO may be an Original Participating TO or a New Participating TO.   |
| <b>Participating TO Service Territory</b>                         | The area in which an IOU, a Local Public Owned Electric Utility, or federal power marketing authority that has turned over its transmission facilities and/or Entitlements to CAISO Operational Control is obligated to provide electric service to Load. A PTO Service Territory may be comprised of the Service Areas of more than one Local Publicly Owned Electric Utility, if they are operating under an agreement with the CAISO for aggregation of their MSS and their MSS Operator is designated as the Participating TO. |

**CAISO TARIFF APPENDIX F**  
**Schedule 4**  
**Eligible Intermittent Resources Forecast Fee**

A charge up to \$.10 per MWh shall be assessed on the metered Energy from Eligible Intermittent Resources as a Forecast Fee, provided that a particular category of Eligible Intermittent Resources may be exempted pursuant to the terms of a Business Practice Manual.

The rate of the Forecast Fee shall be determined so as to recover the projected annual costs related to developing Energy forecasting systems, generating forecasts, validating forecasts, and monitoring forecast performance, that are incurred by the CAISO as a direct result of participation by Eligible Intermittent Resources in CAISO Markets, divided by the projected annual Energy production by all Eligible Intermittent Resources.

The initial Forecast Fee, and all subsequent changes as may be necessary from time to time to recover costs incurred by the CAISO for the forecasting conducted on the behalf of Eligible Intermittent Resources pursuant to the foregoing rate formula, shall be set forth in a Business Practice Manual.

**Participating Intermittent Resources Process Fee**

A process fee charge shall be assessed, for each calendar quarter, to each Exporting Participating Intermittent Resource that exported Energy in the quarter. On an annualized basis, the aggregate quarterly charges shall total to \$10,000. The charge is not volumetric, and shall be calculated as follows:

$$(\$10,000/4)/N = \$\text{quarterly charge}$$

N = number of Participating Intermittent Resources exporting Energy in the quarter

**Participating Intermittent Resources Export Fee**

A Participating Intermittent Resources Export Fee shall be assessed to Exporting Participating Intermittent Resources each calendar month. The Participating Intermittent Resources Export Fee shall be calculated as the product of (1) the sum of all Settlement costs avoided by Participating Intermittent Resources for the preceding calendar month, or portion thereof, consisting of Charge Codes 6486 [Real Time Excess Cost For Instructed] and 1487 [Energy Exchange Program Neutrality], but excluding charges for Uninstructed Energy associated with Charge Code 6475, (2) by the ratio of the total MW/h generated by an Exporting Participating Intermittent Resource during the calendar month, or portion thereof (based on metered output), by the total MW/h generated by all Participating Intermittent Resources during the calendar month, or portion thereof (based on metered output), and (3) by the percentage of the Exporting Participating Intermittent Resource's capacity deemed exporting under Section 5.3 of the EIRP or PIR Export Percentage.

Participating Intermittent Resources Export Fee per Participating Intermittent Resource =

$$\text{Program Costs} \times (\text{MW/h individual Participating Intermittent Resource} / \text{MW/h all Participating Intermittent Resources}) \times \text{PIR Export Percentage}$$

## APPENDIX Q

### Eligible Intermittent Resources Protocol (EIRP)

#### 1 SCOPE

##### 1.1 Scope of Application to Parties

This EIRP applies to the CAISO and to:

- (a) Scheduling Coordinators (SCs);
- (b) Eligible Intermittent Resources; and
- (c) Participating Intermittent Resources.

##### 1.2 Liability of the CAISO

Any liability of the CAISO arising out of or in relation to this EIRP shall be subject to Section 14 of the CAISO Tariff as if references to the CAISO Tariff were references to this EIRP.

#### 2 REQUIREMENTS FOR ELIGIBLE AND PARTICIPATING INTERMITTENT RESOURCES

##### 2.1 No Mandatory Participation

Eligible Intermittent Resources may elect to be scheduled and settled as the CAISO Tariff provides for Generating Units, and are not required to seek certification as Participating Intermittent Resources.

##### 2.2 Minimum Requirements

Eligible Intermittent Resources and Participating Intermittent Resources must meet the following requirements, as applicable.

###### 2.2.1 Agreements

The following agreements must be executed by any Eligible Intermittent Resource:

- (a) A Participating Generator Agreement or QF PGA that, among other things, binds the Eligible Intermittent Resource to comply with the CAISO Tariff; and

- (b) A Meter Service Agreement for CAISO Metered Entities.
- (c) If an Eligible Intermittent Resource intends to become a Participating Intermittent Resource, it must also execute a letter of intent, which when executed and delivered to the CAISO shall initiate the process of certifying the Participating Intermittent Resource. The form of the letter of intent shall be specified by the CAISO in a Business Practice Manual.

### **2.2.2 Composition of a Participating Intermittent Resource**

The CAISO shall develop criteria to determine whether one or more Eligible Intermittent Resources may be included within a Participating Intermittent Resource. Such criteria shall include:

- (a) A Participating Intermittent Resource must be at least one (1) MW rated capacity.
- (b) A Participating Intermittent Resource may include one (1) or more Eligible Intermittent Resources that have similar response to weather conditions or other variables relevant to forecasting Energy, as determined by the CAISO.
- (c) Each Participating Intermittent Resource shall be electrically connected at a single point on the CAISO Controlled Grid, except as otherwise permitted by the CAISO on a case-by-case basis as may be allowed under the CAISO Tariff.
- (d) The same Scheduling Coordinator must schedule all Eligible Intermittent Resources aggregated into a single Participating Intermittent Resource.

### **2.2.3 Equipment Installation**

An Eligible Intermittent Resource must install and maintain the communication equipment required pursuant to Section 3 of this EIRP, and the equipment supporting forecast data required pursuant to Section 6 of this EIRP.

### **2.2.4 Forecast Model Validation**

The CAISO must determine that sufficient historic and real-time telemetered data are available to support an accurate and unbiased forecast of Energy generation by a Participating Intermittent Resource, according to the forecasting process validation criteria described in Section 4 of this EIRP.

### **2.2.5 Information Requirements For Participating Intermittent Resource Export Fee**

In order for the CAISO to administer, implement and calculate the Participating Intermittent Resource Export Fee, each Participating Intermittent Resource jointly with, and through, its Scheduling Coordinator must provide the CAISO with the following information and documents under the schedule and conditions set forth in this section.

The CAISO will maintain the confidentiality of all information and documents received under this section in accordance with CAISO Tariff Section 20 et seq.

- (a) A certification, in the form set forth in a Business Practice Manual, signed by an officer of the Participating Intermittent Resource and its Scheduling Coordinator, identifying (1) the PIR Export Percentage under Section 5.3.2 of this EIRP, if any, and basis thereof, and (2) each contract to sell Energy or capacity from the Participating Intermittent Resource, including for each such contract, the counterparty, start and end dates, delivery point(s), quantity in MW, other temporal terms, i.e., seasonal or hourly limitations.

The certification must be updated by resubmission to the CAISO (1) upon a request to modify the composition of the Participating Intermittent Resource under Section 2.4.2 of this EIRP; or (2) within ten (10) calendar days of final execution of a new contract or any change in counterparty, start and end dates, delivery point(s), quantity in MW, or other temporal terms, as described above, for any prior certified contract. All other contractual changes will not trigger the obligation for recertification;

- (b) Copies of all contracts, including changes, identified in the above-referenced certification; however, price information may be redacted from the contracts provided.

Each Participating Intermittent Resource, as of November 1, 2006, must initially provide the information requested by this Section 2.2.5 in accordance with a Market Notice provided by the CAISO to Participating Intermittent Resources. All other Eligible Intermittent Resources must satisfy this Section 2.2.5 in order to become a Participating Intermittent Resource after November 1, 2006.

### **2.3 Notice of Certification of a Participating Intermittent Resource**

When all requirements described in Section 2.2 of this EIRP applicable to Participating Intermittent Resources have been fulfilled, the CAISO shall notify the Scheduling Coordinator and the representatives of the Eligible Intermittent Resources comprising the Participating Intermittent Resource that the Participating Intermittent Resource has been certified, and is eligible for the settlement terms provided under Section 11.12 of the CAISO Tariff, as conditioned by the terms of this EIRP.

### **2.4 Additional Requirements**

#### **2.4.1 Forecast Fee**

An Eligible Intermittent Resource must pay the Forecast Fee for all metered Energy generated by the Eligible Intermittent Resource, as specified in CAISO Tariff Appendix F, Schedule 4.

#### **2.4.2 Modification of Participating Intermittent Resource Composition**

A Participating Intermittent Resource may seek to modify the composition of the Participating Intermittent Resource (e.g., by adding or eliminating an Eligible Intermittent Resource from the Participating Intermittent Resource). Such changes shall not be implemented without prior compliance with the written approval by the CAISO. The CAISO will apply consistent criteria and expeditiously review any proposed changes in the composition of a Participating Intermittent Resource.

#### **2.4.3 Changes in Scheduling Coordinator**

This EIRP does not impose any additional requirement for CAISO approval to change the Scheduling Coordinator for an approved Participating Intermittent Resource than would otherwise apply under the CAISO Tariff to changes in the Scheduling Coordinator representing a Generating Unit.

#### **2.4.4 Continuing Obligation**

A Participating Intermittent Resource or Eligible Intermittent Resource must meet all applicable obligations established for Participating Intermittent Resources or Eligible Intermittent Resource under the CAISO Tariff and this EIRP, and must fully cooperate in providing all data, other information, and authorizations the CAISO reasonably requests to fulfill its obligation to validate forecast models, explain deviations, and implement the Participating Intermittent Resource Export Fees.

#### **2.4.5 Failure to Perform**

If the CAISO determines that a material deficiency has arisen in the Participating Intermittent Resource's fulfillment of its obligations under the CAISO Tariff and this EIRP, and such Participating Intermittent Resource fails to promptly correct such deficiencies when notified by the CAISO, then the eligibility of the Participating Intermittent Resource for the settlement accommodations provided in Section 11.12 of the CAISO Tariff shall be suspended until such time that the unavailable data is provided or other material deficiency is corrected to the CAISO's reasonable satisfaction. Such suspension shall

not relieve the Scheduling Coordinator for the deficient Participating Intermittent Resource from paying the Forecast Fee over the duration of the period covered by the letter of intent described in Section 2.2.1(c) of this EIRP.

### **3 COMMUNICATIONS**

#### **3.1 Forecast Data**

The CAISO may require various data relevant to forecasting Energy from the Eligible Intermittent Resource to be telemetered to the CAISO, including appropriate operational data, meteorological data or other data reasonably necessary to forecast Energy.

#### **3.2 Standards**

The standards for communications shall be the monitoring and communications requirements for Generating Units providing only Energy; as such standards may be amended from time to time, and published on the CAISO Website.

#### **3.3 Cost Responsibility**

An Eligible Intermittent Resource is responsible for expenses associated with engineering, installation, operation and maintenance of required communication equipment.

### **4 FORECASTING**

The CAISO is responsible for overseeing the development of tools or services to forecast Energy for Participating Intermittent Resources. The CAISO will use its best efforts to develop accurate and unbiased forecasts, as limited by the availability of relevant explanatory data. Objective criteria and thresholds for unbiased, accurate forecasts shall be set forth in a Business Practice Manual, and shall be used to certify Participating Intermittent Resources in accordance with Section 2.2.4 of this EIRP.

#### **4.1 Hour-Ahead Forecast**

The CAISO shall develop expert, independent hourly forecasts of Energy generation for each Participating Intermittent Resource. A forecast shall be published each hour on the half hour for each of the next seven operating hours. Other forecasts, including a Day-Ahead forecast, may be developed at the CAISO's discretion. The Scheduling Coordinator representing the Participating Intermittent Resource must use the hour-ahead forecast that is available thirty (30) minutes prior to the deadline for submitting the HASP/RTM Bids. The CAISO shall use best efforts to provide reliable and timely

forecasts. However, if the CAISO fails to deliver the hour-ahead forecast to the Scheduling Coordinator prior to fifteen (15) minutes before the deadline for submitting HASP/RTM Bids, then the hour-ahead forecast shall be the most recent Energy forecast provided by the CAISO to the Scheduling Coordinator for the operating hour for which Bids are next due.

#### **4.2 Forecast Calibration**

The CAISO shall calibrate the forecast to eliminate bias as measured by net MWh deviations across any and all relevant time periods to minimize the expected cumulative net charges or payments that are recovered or allocated through Section 11.12 of the CAISO Tariff.

#### **4.3 Confidentiality**

The CAISO shall maintain the confidentiality of proprietary data for each Participating Intermittent Resource in accordance with Section 20 of the CAISO Tariff.

### **5 SCHEDULING AND SETTLEMENT**

#### **5.1 Schedules**

Scheduling Coordinators shall be required to submit HASP/RTM Bids (MWh) for the Generating Units that comprise each Participating Intermittent Resource that are identical, in the aggregate, to the hour-ahead forecast published for that Participating Intermittent Resource (MWh).

#### **5.2 Settlement**

After a Participating Intermittent Resource is certified, Settlement shall be determined for each Settlement Period based on consistency of Bids submitted on behalf of such Participating Intermittent Resource with the rules specified in the CAISO Tariff and this EIRP.

#### **5.3 Participating Intermittent Resource Export Fee**

##### **5.3.1 Exemptions**

After November 1, 2006, Participating Intermittent Resources shall be subject to the Participating Intermittent Resource Export Fee, as set forth in Schedule 4 of Appendix F, for Energy generated, except to the extent the Participating Intermittent Resource is exempt under one or more of the following conditions:

### **5.3.2 Participating Intermittent Resource Export Percentage**

Based on the information required in Section 2.2.5 of this EIRP and application of the exemptions to the Participating Intermittent Resource Export Fee in Section 5.3.1 of this EIRP, the CAISO will determine a PIR Export Percentage for each Participating Intermittent Resource that will be calculated as the ratio of the Participating Intermittent Resource's PMax in the CAISO Master File minus the MW, subject to an exemption under Section 5.3.1 of this EIRP on a MW basis to the Participating Intermittent Resource's PMax in the CAISO Master File. For example, a Participating Intermittent Resource with a PMax of one-hundred (100) MW and a contract with a CAISO Balancing Authority Area Load Serving Entity for forty (40) MW would have a PIR Export Percentage of  $(100-40)/100 = 60\%$ . A Participating Intermittent Resource with a PIR Export Percentage greater than zero (0) will be deemed an Exporting Participating Intermittent Resource. The CAISO will notify the Participating Intermittent Resource and its Scheduling Coordinator of the facility's PIR Export Percentage. Any dispute regarding the CAISO's determination of the PIR Export Percentage shall be subject to the dispute resolution procedures under Section 13 of the CAISO Tariff.

### **5.3.3 Quarterly Application of Participating Intermittent Resource Export Fee**

Each quarter the CAISO will charge Exporting Participating Intermittent Resources the Participating Intermittent Resource Export Fee, as set forth in Schedule 4 of Appendix F.

### **5.3.4 Allocation of Credit for Participating Intermittent Resource Export Fees Received**

Payments received by the CAISO from application of the Participating Intermittent Resource Export Fee in accordance with this Section 5.3 shall be allocated as a credit on a quarterly basis to Scheduling Coordinators with Net Negative Uninstructed Deviations in proportion to the to the amount of Net Negative Uninstructed Deviations that each Scheduling Coordinator was assessed for Participating Intermittent Resources Settlement charges for the applicable CAISO Charge Code during the prior quarter.

### **5.3.5 Recording of Exemptions and Notice of Termination**

The CAISO will record any exemption period ending date, if applicable, for each Participating Intermittent Resource. At the conclusion of the exemption period, the CAISO will notify the Scheduling Coordinator for the Participating Intermittent Resource that the facility is no longer exempt from the Participating Intermittent Resource Export Fee.

### **5.3.6 Annual Confirmation**

On December 31 of each calendar year, each Participating Intermittent Resource shall confirm in the form set forth in a Business Practice Manual, signed by an officer of the Participating Intermittent Resource, that the operations of the Participating Intermittent Resource are consistent with any certification(s) provided to the CAISO under Section 2.2.5 of this EIRP.

### **5.3.7 Audit Rights**

In addition to the rights set forth in CAISO Tariff Section 4.6.9, the CAISO shall have the right to contact any counterparty to a contract relied upon under Section 5.3.1 of this EIRP for purposes of determining compliance with this EIRP.

## **6 DATA COLLECTION FACILITIES**

An Eligible Intermittent Resource not otherwise exempt must install and maintain equipment to collect, record and transmit data that the CAISO reasonably determines is necessary to develop and support a forecast model that meets the requirements of Section 4 of this EIRP.

### **6.1 Wind Resources**

An Eligible Intermittent Resource powered by wind must install at least one (1) meteorological tower at a project location that is representative of the microclimate within the project boundary.

The meteorological tower must rely on equipment typically used in the wind industry to continuously monitor weather conditions at a wind resource site. Data collected shall be consistent with requirements set forth in a Business Practice Manual. Such data must be gathered and telemetered to the CAISO in accordance with Section 3 of this EIRP.

If objective standards developed by the CAISO indicate that the meteorological data may not be sufficiently representative of conditions affecting Energy output or changes in Energy output by that Eligible Intermittent Resource, then the CAISO may require that additional meteorological equipment be temporarily installed at another location within the project boundary. The cost of such equipment, which may be temporarily installed by the Eligible Intermittent Resource or the CAISO, shall be the responsibility of the Eligible Intermittent Resource.

If objective standards indicate that the data collected from such a temporary site contribute significantly to the development of an accurate and unbiased forecast, then the Participating Intermittent Resource shall be responsible for installing and arranging for the telemetry of data from an additional permanent meteorological tower at such site, and for the reasonable cost, if any, that the CAISO may have incurred to install and remove the temporary equipment. Relocation of the original meteorological tower to the new site will be allowed if the CAISO determines that a sufficiently accurate and unbiased forecast can be generated from a single relocated meteorological tower.

The CAISO may establish exemptions from requirements of this Section 6.1 in a Business Practice Manual.

### **6.2 Other Eligible Intermittent Resources**

Eligible Intermittent Resources will be required to provide data of comparable relevance to estimating Energy generation. Standards will be developed as such projects are identified and will be specified in a Business Practice Manual.

**7 PROGRAM MONITORING**

The CAISO shall monitor the operation of these rules, and will in particular seek to eliminate any gaming opportunities provided by the flexibility provided Participating Intermittent Resources to self-select participation on an hourly basis.

Participating Intermittent Resources are expected to bid, schedule, and otherwise perform in good faith, and not seek to act strategically in a manner that causes financial gain through systematic behavior, where such gain results solely from the settlement accommodations provided under CAISO Tariff Section 11.12.

If requirements specified in this EIRP are not met, then Participating Intermittent Resource certification may be revoked pursuant to Section 2.4.5 of this EIRP. Any patterns of strategic behavior by Participating Intermittent Resources will be tracked, and the statistical significance of such deviations will be used by the CAISO to evaluate whether changes in the rules defined in this EIRP are appropriate.

The CAISO will monitor the impact of rules for Participating Intermittent Resources on Imbalance Energy and Regulation costs to the CAISO.

**8 AMENDMENTS**

If the CAISO determines a need for an amendment to this EIRP, the CAISO will follow the requirements as set forth in Section 15 of the CAISO Tariff.

**Attachment B – Blacklines**  
**Eligible Intermittent Resource Amendment**  
**Fourth Replacement CAISO Tariff**  
**November 25, 2009**

**9.3.10.3** The following requirements apply to the advance reporting to the CAISO of anticipated and actual Forced Outages:

- (a) Any Operator, upon identification of a situation likely to result in a Forced Outage within the next twenty-four (24) hours unless immediate corrective action is taken, where such action requires the removing from service or reducing the maximum output capability of a Generating Unit or a Resource-Specific System Resource by ten (10) MW or more from the value most recently recorded in SLIC, or removing a transmission facility from service, shall communicate directly with the CAISO Control Center.
- (b) Notwithstanding Section 9.3.10.3(a), and unless otherwise exempted pursuant to the terms of a Business Practice Manual, the Operator of an Eligible Intermittent Resource with a PMax of greater than (ten)10 MW for its entire generating facility, upon identification of a situation likely to result in a Forced Outage within the next twenty-four (24) hours unless immediate corrective action is taken, where such action requires the removing from service or reducing the maximum output capability of the Eligible Intermittent Resource generating facility by one (1) MW or more from the value most recently recorded in SLIC, shall communicate directly with the CAISO Control Center. The failure of the Operator of the Eligible Intermittent Resource to report a Forced Outage between one (1) MW and ten (10) MW in accordance with this Section 9.3.10.3(b) shall be subject only to the provisions of Section 37.4.1.2(a) and (b)(1) of Section 37.4.1.2.

All such notifications of Forced Outages shall be communicated to the CAISO Control Center with as much notice as possible in order that the necessary security analysis and CAISO Controlled Grid assessments may be performed. If prior notice of a Forced Outage cannot be given, the Operator shall notify the CAISO of the Forced Outage within thirty (30) minutes after it occurs. Any Operator, upon identification of a situation likely to result in a Forced Outage but of a nature not requiring a removal from service until some time more than twenty-four (24) hours in the future will be subject to the provisions of

Section 9 with respect to any necessary Outage except the requirements imposing time limits for notification will be waived and the request will be expedited by the CAISO provided notice is given as soon as possible.

**9.3.10.3.1** The following requirements apply if prior notice of a Forced Outage cannot be given to the CAISO:

(a) ~~The~~ The Operator of a Generating Unit or a Resource-Specific System Resource is required to notify the CAISO within sixty (60) minutes after discovering any change in the maximum output capability of at least ten (10) MW or five percent (5%) of the value registered in the Master File, whichever is greater, from the value registered in SLIC that lasts for fifteen (15) minutes or longer.

(b) Notwithstanding Section 9.3.10.3.1(a), and unless otherwise exempted pursuant to the terms of a Business Practice Manual, the Operator of an Eligible Intermittent Resource with a PMax of greater than ten (10) MW for its entire generating facility is required to notify the CAISO within sixty (60) minutes after discovering any change in the maximum output capability of the generating facility of at least one (1) MW from the value registered in SLIC that lasts for fifteen (15) minutes or longer. The failure of the Operator of the Eligible Intermittent Resource to report a Forced Outage between one (1) MW and ten (10) MW in accordance with this Section 9.3.10.3.1(b) shall be subject only to the provisions of Section 37.4.1.2(a) and (b)(1) of Section 37.4.1.2.

\* \* \*

**11.12.3** **Payment of Eligible and Participating Intermittent Resource Fees.**

**11.12.3.1** **Forecasting Fee.**

A fee to defray the costs of the implementation of the forecasting service for ~~Participating~~ Eligible Intermittent Resources shall be assessed to Scheduling Coordinators for ~~Participating~~ Eligible Intermittent Resources as specified in Schedule 4 of Appendix F.

\* \* \*

## APPENDIX A

### Master Definition Supplement

#### Eligible Intermittent Resource

A Generating Unit one (1) MW or larger that is powered by one of the following sources, except for a de minimis amount of Energy from other sources: (1) wind, (2) solar energy, or (3) hydroelectric potential derived from small conduit water distribution facilities that do not have storage capability.

\* \* \*

#### Forecast Fee

The charge imposed on an Participating-Eligible Intermittent Resource pursuant to the terms of Appendix F, Schedule 4.

\* \* \*

#### Participating Intermittent Resource

One or more Eligible Intermittent Resources that meets the requirements of the technical standards for Participating Intermittent Resources adopted by the CAISO and set forth in a Business Practice Manual published on the CAISO Website.

\* \* \*

## APPENDIX F

### Schedule 4

#### Participating-Eligible Intermittent Resources Forecast Fee

A charge up to \$.10 per MWh shall be assessed on the metered Energy from Participating-Eligible Intermittent Resources as a Forecast Fee, provided that a particular category of Eligible Intermittent Resources may be exempted pursuant to the terms of a Business Practice Manual. ~~The amount of the charge shall be specified in the CAISO Tariff.~~

The rate of the Forecast Fee shall be determined so as to recover the projected annual costs related to developing Energy forecasting systems, generating forecasts, validating forecasts, and monitoring forecast performance, that are incurred by the CAISO as a direct result of participation by Eligible Intermittent Resources in CAISO Markets, divided by the projected annual Energy production by all Eligible Intermittent Resources.

The initial Forecast Fee, and all subsequent changes as may be necessary from time to time to recover costs incurred by the CAISO for the forecasting conducted on the behalf of Eligible Intermittent Resources pursuant to the foregoing rate formula, shall be set forth in a Business Practice Manual.

#### Participating Intermittent Resources Process Fee

A process fee charge shall be assessed, for each calendar quarter, to each Exporting Participating Intermittent Resource that exported Energy in the quarter. On an annualized basis, the aggregate quarterly charges shall total to \$10,000. The charge is not volumetric, and shall be calculated as follows:

$$(\$10,000/4)/N = \$\text{quarterly charge}$$

N = number of Participating Intermittent Resources exporting Energy in the quarter

### Participating Intermittent Resources Export Fee

A Participating Intermittent Resources Export Fee shall be assessed to Exporting Participating Intermittent Resources each calendar month. The Participating Intermittent Resources Export Fee shall be calculated as the product of (1) the sum of all Settlement costs avoided by Participating Intermittent Resources for the preceding calendar month, or portion thereof, consisting of Charge Codes 6486 [Real Time Excess Cost For Instructed] and 1487 [Energy Exchange Program Neutrality], but excluding charges for Uninstructed Energy associated with Charge Code 6475, (2) by the ratio of the total MW/h generated by an Exporting Participating Intermittent Resource during the calendar month, or portion thereof (based on metered output), by the total MW/h generated by all Participating Intermittent Resources during the calendar month, or portion thereof (based on metered output), and (3) by the percentage of the Exporting Participating Intermittent Resource's capacity deemed exporting under Section 5.3 of the EIRP or PIR Export Percentage.

Participating Intermittent Resources Export Fee per Participating Intermittent Resource =

Program Costs x (MW/h individual Participating Intermittent Resource/MW/h all Participating Intermittent Resources) x PIR Export Percentage

\* \* \*

## APPENDIX Q

### Eligible Intermittent Resources Protocol (EIRP)

\* \* \*

## 2 REQUIREMENTS FOR ELIGIBLE AND PARTICIPATING INTERMITTENT RESOURCES CERTIFICATION

### 2.1 No Mandatory Participation

Eligible Intermittent Resources may elect to be scheduled and settled as the CAISO Tariff provides for Generating Units, and are not required to seek certification as Participating Intermittent Resources.

### 2.2 ~~Minimum Certification Requirements~~

~~These Eligible Intermittent Resources that intend to become and~~ Participating Intermittent Resources must meet the following requirements, as applicable.

#### 2.2.1 Agreements

The following agreements must be executed by any Eligible Intermittent Resource:

- (a) A Participating Generator Agreement or QF PGA that, among other things, binds the ~~Participating-Eligible~~ Intermittent Resource to comply with the CAISO Tariff; and
- (b) A Meter Service Agreement for CAISO Metered Entities; ~~and~~
- ~~(c)~~ If an Eligible Intermittent Resource A letter of intent ~~st~~ to become a Participating Intermittent Resource, it must also execute a letter of intent, which when executed and delivered to the CAISO shall initiate the process of certifying the Participating Intermittent Resource. The form of the letter of intent shall be specified by the CAISO and published on the CAISO Website in a Business Practice Manual.

### **2.2.2 Composition of a Participating Intermittent Resource**

The CAISO shall develop criteria to determine whether one or more Eligible Intermittent Resources may be included within a Participating Intermittent Resource. Such criteria shall include:

- (a) A Participating Intermittent Resource must be at least one (1) MW rated capacity.
- (b) A Participating Intermittent Resource may include one (1) or more Eligible Intermittent Resources that have similar response to weather conditions or other variables relevant to forecasting Energy, as determined by the CAISO.
- (c) Each Participating Intermittent Resource shall be electrically connected at a single point on the CAISO Controlled Grid, except as otherwise permitted by the CAISO on a case-by-case basis as may be allowed under the CAISO Tariff.
- (d) The same Scheduling Coordinator must schedule all Eligible Intermittent Resources aggregated into a single Participating Intermittent Resource.

### **2.2.3 Equipment Installation**

~~An Eligible Participating~~ Intermittent Resource must install and maintain the communication equipment required pursuant to Section 3 of this EIRP, and the equipment supporting forecast data required pursuant to Section 6 of this EIRP.

### **2.2.4 Forecast Model Validation**

The CAISO must determine that sufficient historic and real-time telemetered data are available to support an accurate and unbiased forecast of Energy generation by a the Participating Intermittent Resource, according to the forecasting process validation criteria described in Section 4 of this EIRP.

### **2.2.5 Information Requirements For Participating Intermittent Resource Export Fee**

In order for the CAISO to administer, implement and calculate the Participating Intermittent Resource Export Fee, each Participating Intermittent Resource jointly with, and through, its Scheduling Coordinator must provide the CAISO with the following information and documents under the schedule and conditions set forth in this section.

The CAISO will maintain the confidentiality of all information and documents received under this section in accordance with CAISO Tariff Section 20 et seq.

- (a) A certification, in the form ~~posted on the CAISO Website~~ set forth in a Business Practice Manual, signed by an officer of the Participating Intermittent Resource and its Scheduling Coordinator, identifying (1) the PIR Export Percentage under Section 5.3.2 of this EIRP, if any, and basis thereof, and (2) each contract to sell Energy or capacity from the Participating Intermittent Resource, including for each such contract, the counterparty, start and end dates, delivery point(s), quantity in MW, other temporal terms, i.e., seasonal or hourly limitations.

The certification must be updated by resubmission to the CAISO (1) upon a request to modify the composition of the Participating Intermittent Resource under Section 2.4.2 of this EIRP; or (2) within ten (10) calendar days of final execution of a new contract or any change in counterparty, start and end dates, delivery point(s), quantity in MW, or other temporal terms, as described above, for any prior certified contract. All other contractual changes will not trigger the obligation for recertification;

- (b) Copies of all contracts, including changes, identified in the above-referenced certification; however, price information may be redacted from the contracts provided.

Each Participating Intermittent Resource, as of November 1, 2006, must initially provide the information requested by this Section 2.2.5 in accordance with a Market Notice provided by the CAISO to Participating Intermittent Resources. All other Eligible Intermittent Resources must satisfy this Section 2.2.5 in order to become a Participating Intermittent Resource after November 1, 2006.

### **2.3 Notice of Certification of a Participating Intermittent Resource**

When all requirements described in Section 2.2 of this EIRP applicable to Participating Intermittent Resources have been fulfilled, the CAISO shall notify the Scheduling Coordinator and the representatives of the Eligible Intermittent Resources comprising the Participating Intermittent Resource that the Participating Intermittent Resource has been certified, and is eligible for the settlement terms provided under Section 11.12 of the CAISO Tariff, as conditioned by the terms of this EIRP.

### **2.4 Additional Requirements After Certification**

#### **2.4.1 Forecast Fee**

~~Beginning on the date first certified, a Participating~~ An Eligible Intermittent Resource must pay the Forecast Fee for all metered Energy generated by the ~~Participating Eligible~~ Intermittent Resource ~~over the duration of the commitment indicated in the letter of intent described in Section 2.2.1(c) of this EIRP,~~ as specified in CAISO Tariff Appendix F, Schedule 4.

~~The amount of the Forecast Fee shall be determined so as to recover the projected annual costs related to developing Energy forecasting systems, generating forecasts, validating forecasts, and monitoring forecast performance, that are incurred by the CAISO as a direct result of participation by Participating Intermittent Resources in CAISO Markets, divided by the projected annual Energy production by all Participating Intermittent Resources.~~

~~The initial rate for the Forecast Fee, and all subsequent rate changes as may be necessary from time to time to recover costs incurred by the CAISO for the forecasting conducted on the behalf of Participating Intermittent Resources, shall be posted on the~~

~~CAISO Website. In no event shall the level of the Forecast Fee exceed the amount specified in CAISO Tariff Appendix F, Schedule 4.~~

\* \* \*

#### **2.4.4 Continuing Obligation**

A Participating Intermittent Resource or Eligible Intermittent Resource must meet all applicable obligations established for Participating Intermittent Resources or Eligible Intermittent Resources under the CAISO Tariff and this EIRP, and must fully cooperate in providing all data, other information, and authorizations the CAISO reasonably requests to fulfill its obligation to validate forecast models, explain deviations, and implement the Participating Intermittent Resource Export Fees.

\* \* \*

### **3 ——— COMMUNICATIONS**

#### **3.1 Forecast Data**

The CAISO may require various data relevant to forecasting Energy from the ~~Participating~~ Eligible Intermittent Resource to be telemetered to the CAISO, including appropriate operational data, meteorological data or other data reasonably necessary to forecast Energy.

\* \* \*

#### **3.3 Cost Responsibility**

An ~~applicant for certification as a~~ Eligible ~~Participating~~ Intermittent Resource is responsible for expenses associated with engineering, installation, operation and maintenance of required communication equipment.

### **4 ——— FORECASTING**

The CAISO is responsible for overseeing the development of tools or services to forecast Energy for Participating Intermittent Resources. The CAISO will use its best efforts to develop accurate and unbiased forecasts, as limited by the availability of relevant explanatory data. Objective criteria and thresholds for unbiased, accurate forecasts shall ~~be published on the CAISO Website~~ set forth in a Business Practice Manual, and shall be used to certify Participating Intermittent Resources in accordance with Section 2.2.4 of this EIRP.

#### **4.1 Hour-Ahead Forecast**

The CAISO shall develop expert, independent hourly forecasts of Energy generation ~~on~~ for each Participating Intermittent Resource. A forecast shall be published each hour on ~~the~~ the half hour for each of the next seven operating hours. Other forecasts, including a Day-Ahead forecast, may be developed at the CAISO's discretion. The Scheduling Coordinator representing the Participating Intermittent Resource must use the hour-ahead forecast that is available thirty (30) minutes prior to the deadline for submitting the HASP/RTM Bids. The CAISO shall use best efforts to provide reliable and timely forecasts. However, if the CAISO fails to deliver the hour-ahead forecast to the Scheduling Coordinator prior to fifteen (15) minutes before the deadline for submitting HASP/RTM Bids, then the hour-ahead forecast shall be the most recent Energy forecast

provided by the CAISO to the Scheduling Coordinator for the operating hour for which Bids are next due.

\* \* \*

## **5 SCHEDULING AND SETTLEMENT**

### **5.1 Schedules**

Scheduling Coordinators shall be required to submit HASP/RTM Bids (MWh) for the Generating Units that comprise each Participating Intermittent Resource that are identical, in the aggregate, to the hour-ahead forecast published for that Participating Intermittent Resource (MWh).

### **5.2 Settlement**

After a Participating Intermittent Resource is certified, Settlement shall be determined for each Settlement Period based on consistency of Bids submitted on behalf of such Participating Intermittent Resources with the rules specified in the CAISO Tariff and this EIRP.

### **5.3 Participating Intermittent Resource Export Fee**

\* \* \*

#### **5.3.2 Participating Intermittent Resource Export Percentage**

Based on the information required in Section 2.2.5 of this EIRP and application of the exemptions to the Participating Intermittent Resource Export Fee in Section 5.3.1 of this EIRP, the CAISO will determine a PIR Export Percentage for each Participating Intermittent Resource that will be calculated as the ratio of the Participating Intermittent Resource's PMax in the CAISO Master File minus the MW, subject to an exemption under Section 5.3.1 of this EIRP on a MW basis to the Participating Intermittent Resource's PMax in the CAISO Master File. For example, a Participating Intermittent Resource with a PMax of one-hundred (100) MW and a contract with a CAISO Balancing Authority Area Load Serving Entity for forty (40) MW would have a PIR Export Percentage of  $(100 - 40) / 100 = 60\%$ . A Participating Intermittent Resource with a PIR Export Percentage greater than zero (0) will be deemed an Exporting Participating Intermittent Resource. The CAISO will notify the Participating Intermittent Resource and its Scheduling Coordinator of the facility's PIR Export Percentage. Any dispute regarding the CAISO's determination of the PIR Export Percentage shall be subject to the dispute resolution procedures under Section 13 of the CAISO Tariff.

\* \* \*

#### **5.3.4 Allocation of Credit for Participating Intermittent Resource Export Fees Received**

Payments received by the CAISO from application of the Participating Intermittent Resource Export Fee in accordance with this Section 5.3 shall be allocated as a credit on a quarterly basis to Scheduling Coordinators with Net Negative Uninstructed Deviations in proportion to the amount of Net Negative Uninstructed Deviations that each Scheduling Coordinator was assessed for Participating Intermittent Resources Settlement charges for the applicable CAISO Charge Code during the prior quarter.

\* \* \*

#### **5.3.6 Annual Confirmation**

On December 31 of each calendar year, each Participating Intermittent Resource shall confirm in the form ~~posted on the CAISO Website~~ set forth in a Business Practice Manual, signed by an officer of the Participating Intermittent Resource, that the operations of the Participating Intermittent Resource are consistent with any certification(s) provided to the CAISO under Section 2.2.5 of this EIRP.

\* \* \*

## 6 DATA COLLECTION FACILITIES

~~The Participating~~ An Eligible Intermittent Resource ~~not otherwise exempt~~ must install and maintain equipment to collect, record and transmit data that the CAISO reasonably determines is necessary to develop and support a forecast model that meets the requirements of Section 4 of this EIRP.

### 6.1 Wind Resources

~~An Participating-Eligible~~ Intermittent Resource powered by wind must install at least one (1) meteorological tower at a project location that is representative of the microclimate within the project boundary.

The meteorological tower must rely on equipment typically used in the wind industry to continuously monitor weather conditions at a wind resource site. Data collected shall be consistent with requirements ~~published on the CAISO Website~~ set forth in a Business Practice Manual. Such data must be gathered and telemetered to the CAISO in accordance with Section 3 of this EIRP.

If objective standards developed by the CAISO indicate that the meteorological data may not be sufficiently representative of conditions affecting Energy output or changes in Energy output by that ~~Participating-Eligible~~ Intermittent Resource, then the CAISO may require that additional meteorological equipment be temporarily installed at another location within the project boundary. The cost of such equipment, which may be temporarily installed by the ~~Participating-Eligible~~ Intermittent Resource or the CAISO, shall be the responsibility of the ~~Participating-Eligible~~ Intermittent Resource.

If objective standards indicate that the data collected from such a temporary site contribute significantly to the development of an accurate and unbiased forecast, then the ~~Participating-Eligible~~ Intermittent Resource shall be responsible for installing and arranging for the telemetry of data from an additional permanent meteorological tower at such site, and for the reasonable cost, if any, that the CAISO may have incurred to install and remove the temporary equipment. Relocation of the original meteorological tower to the new site will be allowed if the CAISO determines that a sufficiently accurate and unbiased forecast can be generated from a single relocated meteorological tower.

The CAISO may establish exemptions from requirements of this Section 6.1 in a Business Practice Manual.

### 6.2 Other Eligible Intermittent Resources

Eligible Intermittent Resources other than wind projects ~~that wish to become Participating Intermittent Resources~~ will be required to provide data of comparable relevance to estimating Energy generation. Standards will be developed as such projects are identified and will be specified in a Business Practice Manual ~~posted on the CAISO Website~~.

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## **PROGRAM MONITORING**

The CAISO shall monitor the operation of these rules, and will in particular seek to eliminate any gaming opportunities provided by the flexibility provided Participating Intermittent Resources to self-select participation on an hourly basis.

Participating Intermittent Resources are expected to bid, schedule, and otherwise perform in good faith, and not seek to act strategically in a manner that causes financial gain through systematic behavior, where such gain results solely from the settlement accommodations provided under CAISO Tariff Section 11.12.

If requirements specified in this ~~technical standard~~ EIRP are not met, then Participating Intermittent Resource certification may be revoked pursuant to Section 2.4.5 of this EIRP. Any patterns of strategic behavior by Participating Intermittent Resources will be tracked, and the statistical significance of such deviations will be used by the CAISO to evaluate whether changes in the rules defined in this EIRP are appropriate.

The CAISO will monitor the impact of rules for Participating Intermittent Resources on Imbalance Energy and Regulation costs to the CAISO.

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## **AMENDMENTS**

If the CAISO determines a need for an amendment to this EIRP, the CAISO will follow the requirements as set forth in Section 15 of the CAISO Tariff.

\* \* \*