



California Independent  
System Operator Corporation

October 19, 2012

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. ER12-1630  
Compliance Filing**

Dear Secretary Bose:

The California Independent System Operator Corporation (ISO) submits this filing in compliance with the Federal Energy Regulatory Commission's September 20, 2012 Order on Compliance in the above-referenced proceeding.<sup>1</sup> The Commission's Order on Compliance accepts the ISO's market design to comply with the directives of Order 755, subject to conditions.<sup>2</sup> Order 755 addresses the compensation of resources providing regulation in organized wholesale power markets. The Commission's Order on Compliance directs the ISO to make certain tariff revisions that the ISO agreed to make in its answer to comments in this proceeding.

The ISO requests an effective date for this compliance filing of May 1, 2013. In its Order on Compliance, the Commission directed the ISO to implement its tariff provisions by January 1, 2013. The ISO, however, is filing a request for rehearing concerning this directive. The ISO is also filing a motion for an extension of time to implement its tariff provisions on May 1, 2013. This motion explains the current status of the ISO's implementation efforts and why the ISO cannot achieve a January 1, 2013 effective date.

---

<sup>1</sup> *California Independent System Operator Corporation*, 140 FERC ¶ 61,206 (September 2012) (Order on Compliance). The ISO submits this filing in compliance with Order No. 714, *Electronic Tariff Filings*, FERC Stats. & Regs. ¶ 31,276 (2009).

<sup>2</sup> *Frequency Regulation Compensation in the Organized Wholesale Power Markets*, 137 FERC ¶ 61,064 (October 2011) (Order 755); *rehearing denied* 138 FERC ¶ 61,123 (February 2012) (Order 755-A).

## I. Background

In October 2011, the Commission issued Order 755, which adopted a final rule for compensation of frequency regulation in organized wholesale power markets. The Commission determined that current compensation methods for regulation service in markets administered by regional transmission operators (RTOs) and independent system operators (ISOs) fail to acknowledge the inherently greater amount of regulation service provided by faster-ramping resources and that certain practices result in economically inefficient economic dispatch of regulation resources. The Commission's final rule requires RTOs and ISOs to compensate regulation resources based on the actual service provided, including a capacity payment that reflects the marginal unit's opportunity costs and a performance payment that reflects the quantity of regulation service actually provided by a resource when the resource accurately follows a control signal. In addition, Order 755 requires the use of a market-based rather than administrative price on which to base performance payments.<sup>3</sup>

After completing a stakeholder process and obtaining authorization from its Board of Governors, the ISO submitted tariff revisions to comply with Order 755 on April 27, 2012. Several parties filed comments on the ISO's tariff revisions and, on June 4, 2012, the ISO filed an answer to comments. On June 8, 2012, the Commission's Office of Energy Market Regulation issued a letter requesting additional information concerning the ISO's tariff revisions. The ISO provided a response to this letter on July 6, 2012. On September 20, 2012, the Commission issued its Order on Compliance accepting the ISO's tariff revisions, subject to the following conditions:

- Modify bid cost recovery rules to calculate bid cost recovery for mileage based on actual performance of a resource rather than instructed mileage. The ISO agreed to this condition in its answer to comments and proposed conforming tariff language, which the Commission accepted, and which is reflected herein.<sup>4</sup>
- Allow for the adjustment of resource-specific mileage multipliers as part of the market optimization to determine clearing prices for mileage to mitigate instances in which estimated mileage is not aligned with likely dispatch of resources receiving regulation awards. The ISO agreed to this condition in its answer to comments and proposed conforming tariff

---

<sup>3</sup> Order 755 at P 128.

<sup>4</sup> Order on Compliance at PP 68 and 73.

language, which the Commission accepted, and which is reflected herein.<sup>5</sup> The Commission's Order on Compliance also asks the ISO to provide a detailed explanation of how the ISO will implement this adjustment and how affected resources will receive notice of any adjustments made by the ISO.<sup>6</sup>

- Clarify that the ISO will treat self-provided regulation as a \$0 capacity bid and a \$0 mileage bid. The ISO agreed to this condition in its answer to comments and proposed conforming tariff language, which the Commission accepted, and which is reflected herein.<sup>7</sup>
- Explain the absence of a defined term for "mileage scarcity price" and explain how mileage pricing interacts with the ISO's existing scarcity pricing provisions.
- Submit an informational report within 14 months of the effective date of the tariff provisions to provide a review of its market design for this enhancement based on one year of operational experience.

## II. Proposed Tariff Modifications on Compliance

Pursuant to the Commission's Order on Compliance, the ISO submits the following additional changes to its tariff to implement Order 755.<sup>8</sup>

Tariff sections 11.8.2.1.6 and 11.8.4.1.6 contain revisions to reflect that mileage bid costs for either the day-ahead market or real-time market shall reflect instructed mileage as adjusted for accuracy. The revised tariff language provides as follows<sup>9</sup>:

### **11.8.2.1.6 IFM AS Bid Cost**

For any Settlement Interval, the IFM AS Bid Cost shall be the product of the IFM AS Award from each accepted IFM AS Bid and

---

<sup>5</sup> Order on Compliance at PP 69 and 73. As explained herein, the ISO proposes to change its tariff language slightly in order to clarify that it will apply this adjustment to resource specific mileage multipliers as opposed to mileage awards.

<sup>6</sup> Order on Compliance at P 73.

<sup>7</sup> Order on Compliance at PP 71 and 73.

<sup>8</sup> The ISO has submitted clean tariff sheets to the Commission's Electronic Tariff filing system with this compliance filing.

<sup>9</sup> Underscored language in grey shading below in reflects incremental proposed additions as compared to the black line version of sections 11.8.2.1.6 and 11.8.4.1.6 filed on April 27, 2012.

the relevant AS Bid Price, divided by the number of Settlement Intervals in a Trading Hour. The CAISO will determine and calculate IFM AS Bid Cost for a Multi-Stage Generating Resource at the Generating Unit or Dynamic Resource-Specific System Resource level. The IFM AS Bid Cost shall also include Mileage Bid Costs. For any Settlement Interval, the IFM Mileage Bid Cost shall be the product of Instructed Mileage associated with a Day Ahead Regulation capacity award, as adjusted for accuracy consistent with Section 11.10.1.7, and the relevant Mileage Bid price, divided by the number of Settlement Intervals in a Trading Hour. The CAISO will determine and calculate IFM Mileage Bid Cost for a Multi-Stage Generating Resource at the Generating Unit or Dynamic Resource-Specific System Resource level.

#### **11.8.4.1.6 RTM AS Bid Cost**

For each Settlement Interval, the Real-Time Market AS Bid Cost shall be the product of the average Real-Time Market AS Award from each accepted AS Bid submitted in the Settlement Interval for the Real-Time Market, reduced by any relevant tier-1 No Pay capacity in that Settlement Interval (but not below zero), with the relevant AS Bid price. The average Real-Time Market AS Award for a given AS in a Settlement Interval is the sum of the 15-minute Real-Time Market AS Awards in that Settlement Interval, each divided by the number of 15-minute Commitment Intervals in a Trading Hour and prorated to the duration of the Settlement Interval (10/15 if the Real-Time Market AS Award spans the entire Settlement Interval, or 5/15 if the Real-Time Market AS Award spans half the Settlement Interval). For a Multi-Stage Generating Resource the CAISO will determine the RTM AS Bid Cost based on the Generating Unit or Dynamic Resource-Specific System Resource level. The Real-Time Market AS Bid Cost shall also include Mileage Bid Costs. For each Settlement Interval, the Real-Time Mileage Bid Cost shall be the product of Instructed Mileage associated with a Real-Time Regulation capacity award, as adjusted for accuracy consistent with Section 11.10.1.7, and the relevant Mileage Bid price divided by the number of Settlement Intervals for the Real-Time Market in a Trading Hour. The CAISO will determine and calculate the Real Time Market Mileage Bid Cost for a Multi-Stage Generating Resource at the Generating Unit or Dynamic Resource-Specific System Resource level.

The third paragraph of proposed tariff section 27.1.3 incorporates tariff revisions to allow the ISO to modify the mileage that can be awarded to a resource to reflect the expected actual mileage the resource may provide and,

therefore, help ensure the efficient selection of resources to satisfy mileage and regulation capacity requirements.<sup>10</sup> The ISO will make this modification through adjustments to resource specific mileage multipliers. The revised tariff section now provides as follows<sup>11</sup>:

The CAISO will calculate resource specific Mileage multipliers and apply these multipliers to resources' Bid-in Regulation Up and Regulation Down capacity. The resource specific Mileage multipliers will reflect resources' Historic Regulation Performance Accuracy and certified 10-minute ramp capability. The CAISO will apply resource specific Mileage multipliers to Bid-in Regulation Up and Regulation Down capacity to determine the expected Mileage. In the event that a resource has not provided Regulation over the prior thirty (30) days, the CAISO will use the simple average Historic Regulation Performance Accuracy for all resources from the prior thirty (30) days as an initial adjustment factor. Upon request, the CAISO will provide a resource with historical data used to derive its Mileage multipliers. A resource will receive a Mileage award that is at least as much as its self-provided or awarded Regulation Up or Regulation Down capacity, but not more than the product of its resource specific mileage multiplier and its self-provided or awarded capacity. The CAISO may adjust resource specific Mileage multipliers to align a resource's awarded Mileage with the resource's expected Mileage. The CAISO will use Mileage awards to determine a uniform clearing mileage price for Regulation Up and Regulation Down, but the Mileage quantity awards will not be financially binding. Resources will receive payments based upon Instructed Mileage as calculated pursuant to Section 11.10.1.7. The CAISO will publish on OASIS the Mileage clearing prices for each hour of the Day-Ahead Market and each fifteen (15) minute period in Real-Time for the Trading Day.

By adjusting resource specific mileage multipliers, the ISO can modify a resource's awarded mileage to reflect the expected actual mileage the resource may provide and, therefore, help ensure the efficient selection of resources to satisfy mileage and regulation capacity requirements as part of the co-optimization. In addition, this adjustment can help reduce unanticipated bid cost

---

<sup>10</sup> The ISO has slightly modified the language it proposes to include in its tariff to clarify that the ISO may adjust resource mileage multipliers and not mileage awards in order to align a resource's awarded mileage with its expected mileage. The revised language clarifies that any adjustment will occur as part of the co-optimization and not after a resource has received an award.

<sup>11</sup> Underscored language in grey shading below reflects incremental proposed additions as compared to the black line version of section 27.1.3 filed on April 27, 2012.

recovery for mileage by mitigating situations in which a resource receives an award that reflects a high mileage bid price and low capacity bid price. By aligning awarded mileage with expected mileage, the ISO will reduce instances in which a resource with a high mileage bid price receives an award for a limited amount of mileage.

The ISO plans to apply this adjustment as part of its review of bids to provide regulation mileage. If the ISO's market systems observe significant variances between mileage awarded to a resource for purposes of establishing a market clearing price and instructed mileage as adjusted for accuracy, the ISO may adjust a resource's mileage multipliers to align its awarded mileage with the resource's expected mileage. Initially, the ISO will consider whether to make an adjustment to a resource's mileage multipliers if the following two conditions occur in 50 percent of the settlement intervals in which the resource provides regulation over the course of a month:

- (1) The resource is awarded mileage equal to the awarded regulation capacity; and
- (2) The resource's actual mileage has exceeded the product of the actual system mileage multiplier [a quantity reflecting expected mileage from 1 MW of regulation up and regulation down capacity in a given hour] and the resource's awarded regulation capacity.

If these conditions occur, a significant number of settlement intervals reflect that a resource's actual mileage deviates from its expected mileage such that it could impact market clearing prices and bid cost recovery. The ISO, accordingly, believes these conditions justify examining whether to make adjustments to a resource's mileage multipliers. If a resource meets these two criteria, the ISO will discuss adjusting the resource's mileage multipliers with the resource's scheduling coordinator. In addition, as described in tariff section 27.1.3, upon request, the ISO will provide a resource with the historical data used to derive the resource's mileage multipliers. The ISO will also notify market participants through the Market and Performance Planning Forum of the number of resources participating in the regulation market that have had their mileage multiplier adjusted. Finally, the ISO will report on the use of these adjustments as part of its informational report that it will file with the Commission based on one year of experience with its market design for this enhancement.

In the third paragraph of proposed changes to tariff section 30.5.2.6.1, the ISO submits revisions to clarify that it will treat self-provided regulation as a \$0 capacity bid and a \$0 mileage bid. The revised language provides as follows<sup>12</sup>:

---

<sup>12</sup> Underscored language in grey shading reflects incremental proposed additions as compared to the black line version of these sections filed on April 27, 2012.

### **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 ~~in 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) and (c) the Bid price (\$) of the Mileage stated separately for Regulation Up and Regulation Down. ~~For submissions to self-provide Regulation Up or Regulation Down, the price for the capacity reservation shall be \$0/MWh and the price for Mileage shall be \$0.~~ 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. Scheduling Coordinators may include inter-temporal opportunity costs in their Regulation capacity bids, but these inter-temporal opportunity costs must be verifiable. 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.

### **III. The ISO has not proposed a mileage scarcity price as part of compliance with Order 755**

As part of its Order on Compliance, the Commission stated that the ISO did not provide a definition of “mileage scarcity price” as part of its tariff revisions. The Commission also stated that the ISO has not explained how mileage pricing interacts with the ISO’s scarcity pricing provisions. The Order on Compliance directs the ISO to address these matters.<sup>13</sup>

---

<sup>13</sup> Order on Compliance at P 75.

The ISO's market design to comply with Order 755 establishes a mileage requirement in each operating hour that will not exceed the sum of each resource's specific mileage multiplier and its self-provided or bid-in regulation capacity.<sup>14</sup> This design avoids mileage scarcity by never setting the mileage requirement at a level that is greater than what bid-in capacity is able to provide. In addition, this variable prevents a scarcity condition in regulation capacity from creating a scarcity condition in regulation mileage. Although the ISO discussed developing a scarcity price for mileage during its stakeholder process, the ISO ultimately determined not to include a scarcity price for mileage based on its formula to establish mileage requirements. As explained in its July 6, 2012 response to the Office of Energy Market Regulation's June 8, 2012 letter requesting additional information, the ISO's market design does not allow mileage requirements to create an artificial need to increase capacity requirements, thereby potentially distorting the ISO's ancillary service prices and undermining ancillary service substitution.<sup>15</sup> After gaining operational experience with its Order 755 compensation design, the ISO may revisit adopting a scarcity pricing mechanism for mileage.<sup>16</sup> Any such change to its Order 755 market design will require the ISO to submit tariff revisions to the Commission for approval.

Under its Order 755 market design, the ISO will retain its existing scarcity pricing demand curves and pricing when there is an insufficient supply of regulation capacity.<sup>17</sup> The ISO's mileage requirement will not impact these demand curves for purposes of pricing regulation capacity when there is insufficient supply.

**IV. The ISO will prepare an informational report based on one year of experience with its market design for this enhancement.**

The Commission's Order on Compliance directs the ISO to conduct an operational review of its market design to implement Order 755 based on one

---

<sup>14</sup> ISO April 27, 2012 transmittal letter at 7.

<sup>15</sup> See ISO July 6, 2012 letter filed in ER12-1630 responding to requests for additional information from the Office of Energy Market Regulation at 11-12.

<sup>16</sup> In connection with its tariff revisions to comply with Order 755, the ISO explained that since many design elements of this proposal are based on historical data, the ISO believes it is prudent to evaluate the design and determine if any modifications are necessary. The ISO proposed to conduct an operational review based on one year of data after this enhancement reaches production to evaluate the ISO's design, including, but not limited to, the appropriate the level of any mileage scarcity price. See ISO April 27, 2012 transmittal letter at 15.

<sup>17</sup> ISO tariff at section 27.1.2.3.

year of operational data.<sup>18</sup> Consistent with the Commission's direction, the ISO commits to complete this review and file an informational report with the Commission within 14 months of the effective date of its tariff revisions.

## V. 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

## VI. Conclusion

The ISO requests that the Commission accept this filing as complying with the directives of the Commission's Order on Compliance. Please contact the undersigned if you have any questions regarding this matter.

Respectfully submitted,

**By: /s/ Andrew Ulmer**

Nancy Saracino  
General Counsel  
Sidney M. Davies  
Assistant General Counsel  
Andrew Ulmer  
Director, Federal Regulatory Affairs  
California Independent System  
Operator Corporation  
250 Outcropping Way  
Folsom, CA 95630  
Tel: (202) 239-3947  
Fax: (916) 608-7222  
[aulmer@caiso.com](mailto:aulmer@caiso.com)

Attorneys for the California Independent  
System Operator

---

<sup>18</sup> Order on Compliance at P 75.

**Attachment A – Clean Tariff**

**Filing in Compliance with September 20, 2012 Order in Docket No. ER12-1630**

**California Independent System Operator**

**Fifth Replacement FERC Electric Tariff**

**October 19, 2012**

#### **11.8.2.1.6 IFM AS Bid Cost**

For any Settlement Interval, the IFM AS Bid Cost shall be the product of the IFM AS Award from each accepted IFM AS Bid and the relevant AS Bid Price, divided by the number of Settlement Intervals in a Trading Hour. The CAISO will determine and calculate IFM AS Bid Cost for a Multi-Stage Generating Resource at the Generating Unit or Dynamic Resource-Specific System Resource level. The IFM AS Bid Cost shall also include Mileage Bid Costs. For any Settlement Interval, the IFM Mileage Bid Cost shall be the product of Instructed Mileage associated with a Day Ahead Regulation capacity award, as adjusted for accuracy consistent with Section 11.10.1.7, and the relevant Mileage Bid price, divided by the number of Settlement Intervals in a Trading Hour. The CAISO will determine and calculate IFM Mileage Bid Cost for a Multi-Stage Generating Resource at the Generating Unit or Dynamic Resource-Specific System Resource level.

\* \* \* \*

#### **11.8.4.1.6 RTM AS Bid Cost**

For each Settlement Interval, the Real-Time Market AS Bid Cost shall be the product of the average Real-Time Market AS Award from each accepted AS Bid submitted in the Settlement Interval for the Real-Time Market, reduced by any relevant tier-1 No Pay capacity in that Settlement Interval (but not below zero), with the relevant AS Bid price. The average Real-Time Market AS Award for a given AS in a Settlement Interval is the sum of the 15-minute Real-Time Market AS Awards in that Settlement Interval, each divided by the number of 15-minute Commitment Intervals in a Trading Hour and prorated to the duration of the Settlement Interval (10/15 if the Real-Time Market AS Award spans the entire Settlement Interval, or 5/15 if the Real-Time Market AS Award spans half the Settlement Interval). For a Multi-Stage Generating Resource the CAISO will determine the RTM AS Bid Cost based on the Generating Unit or Dynamic Resource-Specific System Resource level. The Real-Time Market AS Bid Cost shall also include Mileage Bid Costs. For each Settlement Interval, the Real-Time Mileage Bid Cost shall be the product of Instructed Mileage associated with a Real-Time Regulation capacity award, as adjusted for accuracy consistent with Section 11.10.1.7, and the relevant Mileage Bid price divided by the

number of Settlement Intervals for the Real-Time Market in a Trading Hour. The CAISO will determine and calculate the Real Time Market Mileage Bid Cost for a Multi-Stage Generating Resource at the Generating Unit or Dynamic Resource-Specific System Resource level.

\* \* \* \*

### **27.1.3 Regulation Mileage Clearing Price**

As provided in Section 8.3, Regulation Up and Regulation Down are procured and awarded through the Day Ahead Market and Real-Time Market. The CAISO will calculate uniform Mileage clearing prices for Regulation Up and Regulation Down, respectively, based on the intersection of the demand curve for Mileage requirements and supply curve for Bid-in Mileage. These uniform Mileage clearing prices shall apply to the CAISO Expanded System Region.

The CAISO will calculate a System Mileage Multiplier for Regulation Up by summing the total Mileage provided by all resources with Regulation Up awards each week for a corresponding hour of each Trading Day and then dividing that sum by the Regulation Up capacity procured for that week in that same hour.

The CAISO will calculate a System Mileage Multiplier for Regulation Down by summing the total Mileage provided by all resources with Regulation Down awards each week for a corresponding hour of each Trading Day and then dividing that sum by the Regulation Down capacity procured for that week in that same hour. For purposes of these calculations, each week shall start at the beginning of the hour ending 0100 on Sunday and end at the end of the hour ending 2400 the following Saturday. The CAISO will use the System Mileage Multiplier to assess Mileage requirements for Regulation Up and Regulation Down capacity.

The CAISO will calculate resource specific Mileage multipliers and apply these multipliers to resources' Bid-in Regulation Up and Regulation Down capacity. The resource specific Mileage multipliers will reflect resources' Historic Regulation Performance Accuracy and certified 10-minute ramp capability.

The CAISO will apply resource specific Mileage multipliers to Bid-in Regulation Up and Regulation Down capacity to determine the expected Mileage. In the event that a resource has not provided Regulation over the prior thirty (30) days, the CAISO will use the simple average Historic Regulation Performance

Accuracy for all resources from the prior thirty (30) days as an initial adjustment factor. Upon request, the CAISO will provide a resource with historical data used to derive its Mileage multipliers. A resource will receive a Mileage award that is at least as much as its self-provided or awarded Regulation Up or Regulation Down capacity, but not more than the product of its resource specific mileage multiplier and its self-provided or awarded capacity. The CAISO may adjust resource specific Mileage multipliers to align a resource's awarded Mileage with the resource's expected Mileage. The CAISO will use Mileage awards to determine a uniform clearing mileage price for Regulation Up and Regulation Down, but the Mileage quantity awards will not be financially binding. Resources will receive payments based upon Instructed Mileage as calculated pursuant to Section 11.10.1.7. The CAISO will publish on OASIS the Mileage clearing prices for each hour of the Day-Ahead Market and each fifteen (15) minute period in Real-Time for the Trading Day.

\* \* \* \*

#### **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 in ten (10) minutes; (b) the Bid price of the capacity reservation, stated separately for Regulation Up and Regulation Down (\$/MW) and (c) the Bid price (\$) of the Mileage stated separately for Regulation Up and Regulation Down. For submissions to self-provide Regulation Up or Regulation Down, the price for the capacity reservation shall be \$0/MWh and the price for Mileage shall be \$0. 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. Scheduling Coordinators may include inter-temporal opportunity costs in their Regulation capacity bids, but these inter-temporal opportunity costs must be verifiable. 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.

**Attachment B – Marked Tariff**

**Filing in Compliance with September 20, 2012 Order in Docket No. ER12-1630**

**California Independent System Operator**

**Fifth Replacement FERC Electric Tariff**

**October 19, 2012**

#### **11.8.2.1.6 IFM AS Bid Cost**

For any Settlement Interval, the IFM AS Bid Cost shall be the product of the IFM AS Award from each accepted IFM AS Bid and the relevant AS Bid Price, divided by the number of Settlement Intervals in a Trading Hour. The CAISO will determine and calculate IFM AS Bid Cost for a Multi-Stage Generating Resource at the Generating Unit or Dynamic Resource-Specific System Resource level. The IFM AS Bid Cost shall also include Mileage Bid Costs. For any Settlement Interval, the IFM Mileage Bid Cost shall be the product of Instructed Mileage associated with a Day Ahead Regulation capacity award, as adjusted for accuracy consistent with Section 11.10.1.7, and the relevant Mileage Bid price, divided by the number of Settlement Intervals in a Trading Hour. The CAISO will determine and calculate IFM Mileage Bid Cost for a Multi-Stage Generating Resource at the Generating Unit or Dynamic Resource-Specific System Resource level.

\* \* \* \*

#### **11.8.4.1.6 RTM AS Bid Cost**

For each Settlement Interval, the Real-Time Market AS Bid Cost shall be the product of the average Real-Time Market AS Award from each accepted AS Bid submitted in the Settlement Interval for the Real-Time Market, reduced by any relevant tier-1 No Pay capacity in that Settlement Interval (but not below zero), with the relevant AS Bid price. The average Real-Time Market AS Award for a given AS in a Settlement Interval is the sum of the 15-minute Real-Time Market AS Awards in that Settlement Interval, each divided by the number of 15-minute Commitment Intervals in a Trading Hour and prorated to the duration of the Settlement Interval (10/15 if the Real-Time Market AS Award spans the entire Settlement Interval, or 5/15 if the Real-Time Market AS Award spans half the Settlement Interval). For a Multi-Stage Generating Resource the CAISO will determine the RTM AS Bid Cost based on the Generating Unit or Dynamic Resource-Specific System Resource level. The Real-Time Market AS Bid Cost shall also include Mileage Bid Costs. For each Settlement Interval, the Real-Time Mileage Bid Cost shall be the product of Instructed Mileage associated with a Real-Time Regulation capacity award, as adjusted for accuracy consistent with Section 11.10.1.7, and the relevant Mileage Bid price divided by the

number of Settlement Intervals for the Real-Time Market in a Trading Hour. The CAISO will determine and calculate the Real Time Market Mileage Bid Cost for a Multi-Stage Generating Resource at the Generating Unit or Dynamic Resource-Specific System Resource level.

\* \* \* \*

### **27.1.3 Regulation Mileage Clearing Price**

As provided in Section 8.3, Regulation Up and Regulation Down are procured and awarded through the Day Ahead Market and Real-Time Market. The CAISO will calculate uniform Mileage clearing prices for Regulation Up and Regulation Down, respectively, based on the intersection of the demand curve for Mileage requirements and supply curve for Bid-in Mileage. These uniform Mileage clearing prices shall apply to the CAISO Expanded System Region.

The CAISO will calculate a System Mileage Multiplier for Regulation Up by summing the total Mileage provided by all resources with Regulation Up awards each week for a corresponding hour of each Trading Day and then dividing that sum by the Regulation Up capacity procured for that week in that same hour.

The CAISO will calculate a System Mileage Multiplier for Regulation Down by summing the total Mileage provided by all resources with Regulation Down awards each week for a corresponding hour of each Trading Day and then dividing that sum by the Regulation Down capacity procured for that week in that same hour. For purposes of these calculations, each week shall start at the beginning of the hour ending 0100 on Sunday and end at the end of the hour ending 2400 the following Saturday. The CAISO will use the System Mileage Multiplier to assess Mileage requirements for Regulation Up and Regulation Down capacity.

The CAISO will calculate resource specific Mileage multipliers and apply these multipliers to resources' Bid-in Regulation Up and Regulation Down capacity. The resource specific Mileage multipliers will reflect resources' Historic Regulation Performance Accuracy and certified 10-minute ramp capability.

The CAISO will apply resource specific Mileage multipliers to Bid-in Regulation Up and Regulation Down capacity to determine the expected Mileage. In the event that a resource has not provided Regulation over the prior thirty (30) days, the CAISO will use the simple average Historic Regulation Performance

Accuracy for all resources from the prior thirty (30) days as an initial adjustment factor. Upon request, the CAISO will provide a resource with historical data used to derive its Mileage multipliers. A resource will receive a Mileage award that is at least as much as its self-provided or awarded Regulation Up or Regulation Down capacity, but not more than the product of its resource specific mileage multiplier and its self-provided or awarded capacity. The CAISO may adjust resource specific Mileage multipliers to align a resource's awarded Mileage with the resource's expected Mileage. The CAISO will use Mileage awards to determine a uniform clearing mileage price for Regulation Up and Regulation Down, but the Mileage quantity awards will not be financially binding. Resources will receive payments based upon Instructed Mileage as calculated pursuant to Section 11.10.1.7. The CAISO will publish on OASIS the Mileage clearing prices for each hour of the Day-Ahead Market and each fifteen (15) minute period in Real-Time for the Trading Day.

\* \* \* \*

#### **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 in ten (10) minutes; (b) the Bid price of the capacity reservation, stated separately for Regulation Up and Regulation Down (\$/MW) and (c) the Bid price (\$) of the Mileage stated separately for Regulation Up and Regulation Down. For submissions to self-provide Regulation Up or Regulation Down, the price for the capacity reservation shall be \$0/MWh and the price for Mileage shall be \$0. 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. Scheduling Coordinators may include inter-temporal opportunity costs in their Regulation capacity bids, but these inter-temporal opportunity costs must be verifiable. 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.

## CERTIFICATE OF SERVICE

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

Dated at Washington, DC, this 19<sup>th</sup> day of October, 2012.

*/s/ Daniel Klein*  
Daniel Klein