



October 26, 2015

The Honorable Kimberly D. Bose  
Secretary  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, D.C. 20426

**Re: California Independent System Operator Corporation  
Compliance Filing  
Docket Nos. ER15-1451-\_\_\_\_  
ER14-480-\_\_\_\_  
EL15-98-\_\_\_\_**

Dear Secretary Bose:

The California Independent System Operator Corporation (“CAISO”)<sup>1</sup> submits this filing in compliance with the Commission’s September 25, 2015 order issued in this proceeding.<sup>2</sup>

## **I. BACKGROUND**

Convergence bidding – also known as virtual bidding – enables market participants to hedge their physical market positions and manage their exposure to the differences between day-ahead and real-time prices.<sup>3</sup> Virtual bids are purely financial bids to buy or sell electricity in the day-ahead market without any obligation to provide or consume electricity. If a market participant’s virtual bid is cleared in the day-ahead market, it is automatically liquidated with the opposite

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<sup>1</sup> Capitalized terms not otherwise defined herein have the meanings set forth in appendix A to the CAISO tariff. References to numbered sections are references to sections of the CAISO tariff unless otherwise indicated.

<sup>2</sup> *Cal. Indep. Sys. Operator Corp.*, 152 FERC ¶ 61,234 (2015) (“September 25 order”).

<sup>3</sup> The CAISO tariff uses the term virtual bids. The September 25 order generally refers to convergence bidding. This filing refers to the practice as convergence bidding and to the bids as virtual bids.

buy/sell position at the real-time price. One of the main expected benefits of convergence bidding is to improve the convergence of day-ahead and real-time prices in the CAISO markets.<sup>4</sup>

The CAISO implemented convergence bidding on February 1, 2011 at both internal nodes and the interties.<sup>5</sup> A number of issues arose with convergence bidding on the interties soon afterwards. These issues ultimately led the CAISO to submit a tariff amendment in September 2011 proposing to discontinue convergence bidding on the interties at least until the CAISO could address the issues that had arisen with intertie convergence bidding. The Commission accepted and suspended the CAISO's proposal, for a nominal period, effective November 28, 2011, and conditioned its acceptance on the outcome of a technical conference and on a further Commission order. The Commission convened a technical conference on February 2, 2012. In May 2013, the Commission conditionally accepted the continued suspension of convergence bidding on the interties, finding that the CAISO "should focus its efforts on developing a comprehensive, long-term structural solution that will permit the reinstatement of intertie convergence bidding with just and reasonable outcomes, improving market efficiency by committing supply resources to meet real-time needs."<sup>6</sup>

On November 26, 2013, the CAISO filed a tariff amendment in Docket No. ER14-480 to implement real-time market design enhancements related to Order No. 764, including the establishment of a fifteen-minute market to schedule and settle both intertie and internal resources at the same financially binding 15-minute intervals, and to reinstate convergence bidding on the interties. The CAISO explained that it had developed, with stakeholder input, a structural solution that it believed would permit the reinstatement of intertie convergence bidding with just and reasonable outcomes. In that filing, the CAISO also noted that numerous stakeholders and the Department of Market Monitoring had raised significant concerns with implementation of convergence bidding on the interties at the same time the market was gaining experience with the other significant design changes contained in the tariff amendment. To address these concerns, the CAISO proposed to reinstate convergence bidding on the interties 12 months after the CAISO implemented the other changes contained in the tariff amendment, *i.e.*, on May 1, 2015. The CAISO also proposed to phase in the

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<sup>4</sup> See, e.g., *Cal. Indep. Sys. Operator Corp.*, 130 FERC ¶ 61,122, P 35 (2009) ("Nodal convergence bidding provides benefits that have been well-documented by the Commission. We have found that convergence bidding can . . . improve day-ahead and real-time price convergence . . ."); *Cal. Indep. Sys. Operator Corp.*, 133 FERC ¶ 61,039, P 14 (2010) ("The Commission has found that convergence bidding reduces the price differences between the real-time and the day-ahead markets.")

<sup>5</sup> *Cal. Indep. Sys. Operator Corp.*, 133 FERC ¶ 61,039 at PP 1, 253.

<sup>6</sup> *Cal. Indep. Sys. Operator Corp.*, 143 FERC ¶ 61,087 at P 61 (2013).

reinstatement of convergence bidding on the interties through the use of gradually increasing position limits, which would limit the megawatt quantity of virtual bids that could be submitted by a convergence bidding entity to a specified percentage of the intertie transfer capability.

In March 2014, the Commission issued an order accepting the tariff filing in Docket No. ER14-480 and conditionally authorizing the CAISO to recommence convergence bidding on the interties upon submitting an informational report addressing whether “the anticipated benefits of intertie convergence bidding outweigh any expected market inefficiencies.”<sup>7</sup>

On December 31, 2014, the CAISO filed the informational report required by the March 2014 order. The report stated that the data considered in the report “do not present a basis for not moving forward with reinstating intertie convergence bidding on May 1, 2015” but noted that “[i]f new data becomes available suggesting otherwise, then the CAISO will take appropriate actions to address those issues.”

On April 3, 2015, the CAISO filed in Docket No. ER15-1451 a request for waiver of provisions in sections 30.9, 30.7.3.6.3, and 30.7.3.6.3.2 of the CAISO tariff, which provide for reinstatement of intertie convergence bidding on May 1, 2015. In support of this waiver request, the CAISO provided a report by the Department of Market Monitoring indicating that reinstatement of convergence bidding on the interties under current circumstances would lead to market inefficiencies.

On April 29, 2015, the Commission issued an order granting, subject to a further order, limited waiver of the May 1, 2015 reinstatement of intertie convergence bidding to allow the Commission to develop a fuller record regarding the issues raised in the CAISO’s waiver request.<sup>8</sup> The Commission also sought further comments on the December 2014 and April 2015 reports on intertie convergence bidding.

In the September 25 order, the Commission acted on the full record in this proceeding, finding that the CAISO tariff provisions reinstating convergence bidding on the interties are unjust and unreasonable and directing the CAISO to submit a compliance filing within 30 days reflecting removal of the relevant tariff provisions.<sup>9</sup>

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<sup>7</sup> *Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,204 at P 103 (2014).

<sup>8</sup> *Cal. Indep. Sys. Operator Corp.*, 151 FERC ¶ 61,074 (2015).

<sup>9</sup> September 25 order, 152 FERC ¶ 61,234 at PP 41-45. The Commission noted that its removal of the tariff provisions is without prejudice to the CAISO proposing convergence bidding on the interties in the future when it can be shown to be just and reasonable. *Id.* at P 46.

## **II. REMOVAL OF TARIFF PROVISIONS ESTABLISHING CONVERGENCE BIDDING ON THE INTERTIES**

In the September 25 order, the Commission terminated tariff provisions establishing convergence bidding at the interties “as of the date of issuance of this order” and directed the CAISO to “submit a compliance filing, within 30 days of the date of this order, to remove the previously accepted tariff provisions establishing convergence bidding at the interties.”<sup>10</sup> In this filing, the CAISO removes references to convergence bidding at the interties in sections 30.9 and 30.7.3.6.3 of the CAISO tariff. The CAISO also removes the entire text of section 30.7.3.6.3.2, a provision that applies solely to the establishment of position limits for virtual bids at the interties. The CAISO deletes a reference to virtual bids in section 30.8 which was added as part of the tariff provisions implementing convergence bidding at the interties. The CAISO further revises the definition of “Eligible Aggregated PNode” to remove a reference to convergence bidding at the interties.

Additionally, the CAISO also removes two references to virtual bids in section 31.8.1. Section 31.8.1 was added to the tariff in the November 26, 2013, filing submitted in Docket No. ER14-480, and largely replicates tariff language that was in the CAISO tariff prior to the original suspension of convergence bidding at the interties in September 2011. It also provides the CAISO with authority to enforce within the residual unit commitment (“RUC”) process “a constraint at each intertie such that physical imports net of physical exports must be less than or equal to the scheduling limit at the Scheduling Point in the applicable direction.” This authority is not solely necessary for implementing convergence bidding at the interties and was not included in section 31.8 as it existed upon initial implementation of convergence bidding in 2011. Further, even with the elimination of convergence bidding at the interties, the CAISO’s authority to enforce this constraint in RUC has been in effect since May 2014. Accordingly, the CAISO proposes amendments to section 31.8.1 only to the extent needed for the tariff to reflect that convergence bidding at the interties is not allowed.

## **III. ATTACHMENTS**

In addition to this transmittal letter, this compliance filing includes Attachments A and B. Attachment A contains clean CAISO tariff sheets reflecting the tariff revisions described above. Attachment B shows these revisions in black-line format.

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<sup>10</sup> September 25 order, 152 FERC ¶ 61,234 at P 45.

#### IV. CONCLUSION

For the reasons set forth above, the CAISO respectfully requests that the Commission approve the tariff modifications in Attachments A and B in compliance with the September 25 order, effective as of September 25, 2015. If there are any questions regarding this filing, please feel free to contact the undersigned.

Respectfully submitted,

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**Attachment A – Clean Tariff Records**

**Filing in Compliance with September 25, 2015 Order in Docket Nos. ER15-1451-000 et al.**

**October 26, 2015**

**California Independent System Operator Corporation**

### **30.7.3.6.3 Position Limits**

For each Convergence Bidding Entity, the CAISO will reject all Virtual Bids submitted by its Scheduling Coordinator at any Eligible PNode or Eligible Aggregated PNode (other than a Default LAP or Trading Hub) that exceed the position limits specified in this Section 30.7.3.6.3. If the Scheduling Coordinator uses multiple SCIDs on behalf of a Convergence Bidding Entity, the position limits will apply to the sum of those Virtual Bids submitted at the Eligible PNode or Eligible Aggregated PNode (other than a Default LAP or Trading Hub). The CAISO will perform all position limit calculations based on the highest Virtual Bid segment MW point submitted in the Virtual Bid Curve. The CAISO will not net Virtual Supply Bids and Virtual Demand Bids in performing the position limit calculations. The affected Scheduling Coordinator will be provided notice that position limits have been violated. If the Scheduling Coordinator does not resubmit Virtual Bids within the position limits, the CAISO will reject Virtual Bids for all hours at each Eligible PNode and Eligible Aggregated PNode (other than a Default LAP or Trading Hub) where the position limits are violated. Position limits only apply to Eligible PNodes or Eligible Aggregated PNodes (other than Default LAPs or Trading Hubs).

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### **30.7.3.6.3.2 [Not Used]**

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## **30.8 Bids On Out-Of-Service Paths At Scheduling Points Prohibited**

Scheduling Coordinators shall not submit any Bids or ETC Self-Schedules at Scheduling Points using a transmission path for any Settlement Period for which the Total Transfer Capability for that path is zero (0) MW. The CAISO shall reject Bids or ETC Self-Schedules submitted at Scheduling Points where the Total Transfer Capability on the transmission path is zero (0) MW. If the Total Transfer Capability of a transmission path at the relevant Scheduling Point is reduced to zero (0) after Day-Ahead Schedules have been issued, then, if time permits, the CAISO shall direct the responsible Scheduling Coordinators to reduce all MWh associated with the Bids on such zero-rated transmission paths to zero (0) in the RTM. As necessary to comply with Applicable Reliability Criteria, the CAISO shall reduce any non-zero (0) RTM

Bids across zero-rated transmission paths to zero after the Market Close for the RTM.

### **30.9 Virtual Bids**

Virtual Bids are Energy Bids that may be submitted only in the Day-Ahead Market, at Eligible PNodes or Eligible Aggregated PNodes where virtual bidding is permitted, by Scheduling Coordinators representing Convergence Bidding Entities. Virtual Bids are either Virtual Supply Bids or Virtual Demand Bids. A Virtual Bid submitted in the Day-Ahead Market and cleared in the IFM represents a commitment to liquidate a Day-Ahead award in the Real-Time Market at the price determined for the applicable Eligible PNode or Eligible Aggregated PNode as set forth in Section 11.3. For each SCID associated with a Convergence Bidding Entity, there may be only one Virtual Supply Bid and one Virtual Demand Bid per each Eligible PNode or Eligible Aggregated PNode in the Day-Ahead Market. The minimum size of a segment of a Virtual Bid is one (1) MW.

#### **30.9.1 Virtual Bid Components**

Each Virtual Bid must have the following components: an indicator that identifies the Virtual Bid as a Virtual Supply Bid or a Virtual Demand Bid; Scheduling Coordinator ID Code; Eligible PNode or Eligible Aggregated PNode as applicable; Virtual Bid Curve; and the Trading Hour or Trading Day to which the Virtual Bid applies. Virtual Bids do not include Start-Up Costs or Minimum Load Costs.

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### **31.8 Constraints Enforced at Interties**

#### **31.8.1 Scheduling Constraint**

Within the IFM and RTM optimizations, the CAISO enforces a constraint at each CAISO Intertie such that physical imports net of physical exports must be less than or equal to the scheduling limit at the Scheduling Point in the applicable direction. The CAISO incorporates the Shadow Price of this IFM constraint into the CAISO Market runs used to establish LMPs for both physical and virtual awards. Within the RUC process, the CAISO enforces a constraint at each Intertie such that physical imports net of physical exports must be less than or equal to the scheduling limit at the Scheduling Point in the applicable direction. Through this RUC constraint the CAISO determines what Day-Ahead Schedules

can have an E-Tag submitted Day-Ahead. Day-Ahead Schedules precluded from submitting an E-Tag in the Day-Ahead on this basis are exempt from the charges described in Section 11.32.

### **31.8.2 Physical Flow Constraint**

The CAISO may enforce a physical flow constraint limit at each internal and Intertie location in the IFM taking into account the total power flow contributions, which include internal schedules and import/export schedules, which can be physical or virtual, and the CAISO's estimates of unscheduled flow at the Interties. The physical flow constraint limit at each Intertie is less than or equal to the Transmission Constraints, including Nomograms and Contingencies, affecting the Intertie. At each Intertie the scheduling and physical flow constraint limits may differ. In the RUC and RTM processes, the same physical flow constraint limit is applied and internal schedules and import/export schedules, which can only be physical, are considered along with the CAISO's estimates of unscheduled flow at the Interties. The CAISO will not enforce physical flow constraints at Interties for which the CAISO (1) is subject to contractual arrangements that provide for the management of unscheduled flows using other procedures; (2) has determined it cannot enforce the power flow constraints due to modeling inaccuracies, including inaccuracies in available data; or (3) has otherwise determined that enforcing the power flow constraints could result in adverse reliability impacts.

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## **Appendix A**

### **Master Definition Supplement**

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#### **Eligible Aggregated PNode**

An Aggregated PNode where either aggregated physical supply, a Default LAP, or a Trading Hub are located and where virtual bidding is permitted.

**Attachment B – Marked Tariff Records**

**Filing in Compliance with September 25, 2015 Order in Docket Nos. ER15-1451-000 et al.**

**October 26, 2015**

**California Independent System Operator Corporation**

### 30.7.3.6.3 Position Limits

For each Convergence Bidding Entity, the CAISO will reject all Virtual Bids submitted by its Scheduling Coordinator at any Eligible PNode, ~~or~~ Eligible Aggregated PNode (other than a Default LAP or Trading Hub), ~~or Intertie~~ that exceed the position limits specified in this Section 30.7.3.6.3. If the Scheduling Coordinator uses multiple SCIDs on behalf of a Convergence Bidding Entity, the position limits will apply to the sum of those Virtual Bids submitted at the Eligible PNode, ~~or~~ Eligible Aggregated PNode (other than a Default LAP or Trading Hub), ~~or Intertie~~. The CAISO will perform all position limit calculations based on the highest Virtual Bid segment MW point submitted in the Virtual Bid Curve. The CAISO will not net Virtual Supply Bids and Virtual Demand Bids in performing the position limit calculations. The affected Scheduling Coordinator will be provided notice that position limits have been violated. If the Scheduling Coordinator does not resubmit Virtual Bids within the position limits, the CAISO will reject Virtual Bids for all hours at each Eligible PNode, ~~and~~ Eligible Aggregated PNode (other than a Default LAP or Trading Hub), ~~and Intertie~~ where the position limits are violated. Position limits only apply to Eligible PNodes or Eligible Aggregated PNodes (other than Default LAPs or Trading Hubs), ~~and Interties~~.

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#### 30.7.3.6.3.2 ~~[Not Used] Position Limits at Interties~~

~~For an Intertie, the locational limits will be equal to a percentage of the Operating Transfer Capability of the Intertie. The percentages used to calculate the position limits of each Convergence Bidding Entity at Interties will be the following percentages of the published locational limits:~~

- ~~(a) — Position limits of zero (0) percent will apply during the time period beginning as of the effective date of this tariff provision through the last day of the twelfth month following the effective date of this section 30.7.3.6.3.2.~~
- ~~(b) — Position limits of five (5) percent will apply during the time period beginning as of the first day of the thirteenth month following the effective date of this tariff provision through the last day of the twentieth month following the effective date of this tariff provision.~~
- ~~(c) — Position limits of twenty five (25) percent will apply during the time period beginning on the first day of the twenty first month following the effective date of this tariff provision~~

~~through the last day of the twenty-fourth month following the effective date of this tariff provision.~~

~~(d) Position limits of fifty (50) percent will apply during the time period beginning on the first day of the twenty-fifth month following the effective date of this tariff provision through the last day of the twenty-eighth month following the effective date of this tariff provision.~~

~~(e) Position limits will cease to apply beginning on the first day of the twenty-ninth month following the effective date of this tariff provision.~~

~~The CAISO will enforce the locational limits for Interties at Bid submission and at Market Close for Virtual Bids. The CAISO will utilize the 9:00 AM Operating Transfer Capability for Bids submitted after 9:00 AM until the close of the Day-Ahead Market for the next Trading Day.~~

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### **30.8 Bids On Out-Of-Service Paths At Scheduling Points Prohibited**

Scheduling Coordinators shall not submit any Bids, ~~including Virtual Bids,~~ or ETC Self-Schedules at Scheduling Points using a transmission path for any Settlement Period for which the Total Transfer Capability for that path is zero (0) MW. The CAISO shall reject Bids or ETC Self-Schedules submitted at Scheduling Points where the Total Transfer Capability on the transmission path is zero (0) MW. If the Total Transfer Capability of a transmission path at the relevant Scheduling Point is reduced to zero (0) after Day-Ahead Schedules have been issued, then, if time permits, the CAISO shall direct the responsible Scheduling Coordinators to reduce all MWh associated with the Bids on such zero-rated transmission paths to zero (0) in the RTM. As necessary to comply with Applicable Reliability Criteria, the CAISO shall reduce any non-zero (0) RTM Bids across zero-rated transmission paths to zero after the Market Close for the RTM.

### **30.9 Virtual Bids**

Virtual Bids are Energy Bids that may be submitted only in the Day-Ahead Market, at Eligible PNodes, ~~including PNodes located at an Intertie where virtual bidding is permitted,~~ or Eligible Aggregated PNodes, ~~including Aggregated PNodes located at an Intertie,~~ where virtual bidding is permitted, by Scheduling

Coordinators representing Convergence Bidding Entities. Virtual Bids are either Virtual Supply Bids or Virtual Demand Bids. A Virtual Bid submitted in the Day-Ahead Market and cleared in the IFM represents a commitment to liquidate a Day-Ahead award in the Real-Time Market at the price determined for the applicable Eligible PNode or Eligible Aggregated PNode as set forth in Section 11.3. For each SCID associated with a Convergence Bidding Entity, there may be only one Virtual Supply Bid and one Virtual Demand Bid per each Eligible PNode or Eligible Aggregated PNode in the Day-Ahead Market. The minimum size of a segment of a Virtual Bid is one (1) MW.

### **30.9.1 Virtual Bid Components**

Each Virtual Bid must have the following components: an indicator that identifies the Virtual Bid as a Virtual Supply Bid or a Virtual Demand Bid; Scheduling Coordinator ID Code; Eligible PNode or Eligible Aggregated PNode as applicable; Virtual Bid Curve; and the Trading Hour or Trading Day to which the Virtual Bid applies. Virtual Bids do not include Start-Up Costs or Minimum Load Costs.

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## **31.8 Constraints Enforced at Interties**

### **31.8.1 Scheduling Constraint**

Within the IFM and RTM optimizations, the CAISO enforces a constraint at each CAISO Intertie such that physical ~~and virtual~~ imports net of physical ~~and virtual~~ exports must be less than or equal to the scheduling limit at the Scheduling Point in the applicable direction. The CAISO incorporates the Shadow Price of this IFM constraint into the CAISO Market runs used to establish LMPs for both physical and virtual awards. Within the RUC process, the CAISO enforces a constraint at each Intertie such that physical imports net of physical exports must be less than or equal to the scheduling limit at the Scheduling Point in the applicable direction. Through this RUC constraint the CAISO determines what Day-Ahead Schedules can have an E-Tag submitted Day-Ahead. Day-Ahead Schedules precluded from submitting an E-Tag in the Day-Ahead on this basis are exempt from the charges described in Section 11.32.

### **31.8.2 Physical Flow Constraint**

The CAISO may enforce a physical flow constraint limit at each internal and Intertie location in the IFM taking into account the total power flow contributions, which include internal schedules and import/export schedules, which can be physical or virtual, and the CAISO's estimates of unscheduled flow at the Interties. The physical flow constraint limit at each Intertie is less than or equal to the Transmission Constraints, including Nomograms and Contingencies, affecting the Intertie. At each Intertie the scheduling and physical flow constraint limits may differ. In the RUC and RTM processes, the same physical flow constraint limit is applied and internal schedules and import/export schedules, which can only be physical, are considered along with the CAISO's estimates of unscheduled flow at the Interties. The CAISO will not enforce physical flow constraints at Interties for which the CAISO (1) is subject to contractual arrangements that provide for the management of unscheduled flows using other procedures; (2) has determined it cannot enforce the power flow constraints due to modeling inaccuracies, including inaccuracies in available data; or (3) has otherwise determined that enforcing the power flow constraints could result in adverse reliability impacts.

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## **Appendix A**

### **Master Definition Supplement**

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#### **Eligible Aggregated PNode**

An Aggregated PNode ~~located at an Intertie where virtual bidding is permitted, or an Aggregated PNode~~ where either aggregated physical supply, a Default LAP, or a Trading Hub are located and where virtual bidding is permitted.

## CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon the 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, D.C. this 26th day of October, 2015.

*/s/ Daniel Klein*

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 Daniel Klein