**California Independent System Operator Corporation**

**Fifth Replacement FERC Electric Tariff**

**Convergence Bidding at the Interties Amendment**

**Marked Tariff**

**11.2.4.1 Calculation of the IFM Congestion Charge**

For each Settlement Period of the IFM, the CAISO shall calculate the IFM Congestion Charge as the IFM MCC amount for all scheduled Demand and Virtual Supply Awards minus the IFM MCC amount for all scheduled Supply and Virtual Supply Awards. The IFM MCC amount for all scheduled Demand and Virtual Demand Awards is the sum of the products of the IFM MCC and the total of the MWh of Demand scheduled in the Day-Ahead Schedule and Virtual Supply Awards at all the applicable PNodes and Aggregated Pricing Nodes for the Settlement Period. The IFM MCC amount for all scheduled Supply and Virtual Supply Awards is the sum of the products of the IFM MCC and the total of the MWh of Supply scheduled in the Day-Ahead Schedule and the Virtual Supply Awards at all the applicable PNodes for the Settlement Period.

\* \* \*

### 11.2.4.6 Adjustment of CRR Revenue

The CAISO will adjust the revenue from the CRRs of a CRR Holder that is also a Convergence Bidding Entity, and will adjust the revenue from the CRRs of a CRR Holder (regardless of whether the CRR Holder is also a Convergence Bidding Entity) where the Scheduling Coordinator representing that CRR Holder has reduced a Day-Ahead import or export Schedule in the HASP as set forth in Section 11.32, whenever the virtual bidding activity on behalf of that entity or a reduction to a Day-Ahead import or export Schedule in the HASP has had a significant impact on the value of the CRRs in the DAM as determined in accordance with the following steps.

(a) For purposes of this Section 11.2.4.6 and the definition of Flow Impact, any reduction by a Scheduling Coordinator submitting Schedules on behalf of an entity that is a CRR Holder to an import or export Schedule in the HASP will be treated as a Virtual Award. For each CRR Holder subject to this Section 11.2.4.6, for each hour, and for each Transmission Constraint binding in the IFM, HASP, or RTD, the CAISO will calculate the Flow Impact of the Virtual Awards awarded to the Scheduling Coordinator that represents the CRR Holder, excluding Virtual Awards at LAPs and generation Trading Hubs.

(b) The CAISO will determine the peak and off-peak hours of the day in which Congestion on the Transmission Constraint was significantly impacted by the Virtual Awards awarded to the Scheduling Coordinator that represents the CRR Holder. Congestion on the Transmission Constraint will be deemed to have been significantly impacted by the Virtual Awards awarded to the Scheduling Coordinator that represents the CRR Holder if the Flow Impact passes two criteria. First, the Flow Impact must be in the direction to increase the value of the CRR Holder’s CRR portfolio. Second, the Flow Impact must exceed the threshold percentage of the flow limit for the Transmission Constraint. The threshold percentage is ten (10) percent of the flow limit for each Transmission Constraint.

(c) For each peak or off-peak hour that passes both criteria in Section 11.2.4.6(b), the CAISO will compare the Transmission Constraint’s impact on the Day-Ahead Market value of the CRR Holder’s CRR portfolio with the Transmission Constraint’s impact on the HASP or Real-Time Market value of the CRR Holder’s CRR portfolio, as applicable.

(d) The CAISO will adjust the peak or off-peak period revenue from the CRR Holder’s CRRs in the event that, over the peak or off-peak period of a day, the Transmission Constraint’s contribution to the Day-Ahead Market value of the CRR Holder’s CRR portfolio exceeds the Transmission Constraint’s contribution to the HASP or Real-Time Market value of the CRR Holder’s CRR portfolio, as applicable. The amount of the peak period adjustment will be the amount by which the Transmission Constraint’s contribution to the Day-Ahead Market value of the CRR Holder’s CRR portfolio exceeds the Transmission Constraint’s contribution to the HASP or Real-Time Market value of the CRR Holder’s CRR portfolio for the peak-period hours that passed both criteria in Section 11.2.4.6(b), as applicable. The amount of the off-peak period adjustment will be the amount by which the Transmission Constraint’s contribution to the Day-Ahead Market value of the CRR Holder’s CRR portfolio exceeds the Transmission Constraint’s contribution to the HASP or Real-Time Market value of the CRR Holder’s CRR portfolio for the off-peak period hours that passed both criteria in Section 11.2.4.6(b), as applicable.

All adjustments of CRR revenue calculated pursuant to this Section 11.2.4.6 will be added to the CRR Balancing Account.

\* \* \*

### 11.3.1 Virtual Supply Awards

The CAISO will pay each Scheduling Coordinator with Virtual Supply Awards at an Eligible PNode or Eligible Aggregated PNode an amount equal to the Day-Ahead LMP at the Eligible PNode or Eligible Aggregated PNode multiplied by the MWhs of Virtual Supply Awards. Virtual Supply Awards subject to price correction will be settled as specified in Section 11.21. The CAISO will charge each Scheduling Coordinator with Virtual Supply Awards at an Eligible PNode or Eligible Aggregated PNode an amount equal to the simple hourly average of the Dispatch Interval Real-Time LMPs at the Eligible PNode or Eligible Aggregated PNode multiplied by the MWhs of Virtual Supply Awards.

### 11.3.2 Virtual Demand Awards

The CAISO will charge each Scheduling Coordinator with Virtual Demand Awards at an Eligible PNode or Eligible Aggregated PNode an amount equal to the Day-Ahead Market LMP at the Eligible PNode or Eligible Aggregated PNode multiplied by the MWhs of Virtual Demand Awards. Virtual Demand Awards subject to price correction will be settled as specified in Section 11.21. The CAISO will pay each Scheduling Coordinator with Virtual Demand Awards at an Eligible PNode or Eligible Aggregated PNode an amount equal to the simple hourly average of the Dispatch Interval Real-Time LMPs at the Eligible PNode or Eligible Aggregated PNode multiplied by the IFM MWhs of Virtual Demand Awards.

\* \* \*

### 12.8.2 Virtual Bid Reference Prices

For Virtual Supply Bids, the Virtual Bid Reference Price will be the 95th percentile value of the difference between the LMP in the Real-Time Market and the LMP in the Day-Ahead Market at a given Eligible PNode or Eligible Aggregated PNode. For Virtual Demand Bids, the Virtual Bid Reference Price will be the 95th percentile value of the difference between the LMP in the Day-Ahead Market and the LMP in the Real-Time Market at a given Eligible PNode or Eligible Aggregated PNode. Each Virtual Bid Reference Price will be calculated in $/MWh. The CAISO will calculate the Virtual Bid Reference Price for each Eligible PNode or Eligible Aggregated PNode for three-month periods (covering January-March, April-June, July-September, and October-December) of each year using the hourly actual LMPs for the same period of the previous year.

\* \* \*

### 12.8.4 Adjustment of EAL After the Close of the RTM

After the Real-Time Market closes, the CAISO will recalculate the total liability of each Scheduling Coordinator with Virtual Awards based on the MW quantity that cleared in the Day-Ahead Market and the LMPs produced in the Day-Ahead Market and Real-Time Market. The total liability of a Scheduling Coordinator will equal the sum of the liability of each Virtual Bid submitted by the Scheduling Coordinator that cleared in the Day-Ahead Market. The liability of a Virtual Supply Bid will equal the product of the value of the amount of cleared MWs multiplied by the difference between the Real-Time LMP and the Day-Ahead LMP at the Eligible PNode or Eligible Aggregated PNode at which the Virtual Supply Bid was submitted. The liability of a Virtual Demand Bid will equal the product of the value of the amount of cleared MWs multiplied by the difference between the Day-Ahead LMP and the Real-Time LMP at the Eligible PNode or Eligible Aggregated PNode at which the Virtual Demand Bid was submitted. The Estimated Aggregate Liability will be adjusted accordingly and will continue to be adjusted as a result of any price correction made in accordance with Section 35.

\* \* \*

**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 or 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).

\* \* \*

**\* \* \***

## 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 Operating Transfer Capability for that path is zero (0) MW. The CAISO shall reject Bids or ETC Self-Schedules submitted at Scheduling Points where the Operating Transfer Capability on the transmission path is zero (0) MW. If the Operating 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 HASP. As necessary to comply with Applicable Reliability Criteria, the CAISO shall reduce any non-zero (0) HASP Bids across zero-rated transmission paths to zero after the Market Close for the HASP.

## 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.

\* \* \*

## 31.8 [Not Used]

## Appendix A

**Master Definitions Supplement**

**\* \* \***

## - Eligible PNode

A PNode where either physical supply or demand is located and where virtual bidding is permitted.

\* \* \*

## - Real-Time Congestion Offset

For each Settlement Period of the HASP and RTM, the CAISO shall calculate the Real-Time Congestion Offset as the difference of 1) the sum of the products of the total of the Demand Imbalance Energy and Virtual Supply liquidated as demand in the RTM and the RTM MCC at the relevant Location; and 2) the sum of the products of the total of the Supply Imbalance Energy and Virtual Demand liquidated as supply in the RTM and the RTM MCC at the relevant Location; including also the sum of RTM and HASP Congestion Charges for Intertie Ancillary Services Awards, and excluding the HASP and RTM Congestion Credit for ETCs and TORs calculated as provided in Section 11.5.7.1. The Real-Time Congestion Offset is allocated as provided in Section 11.5.4.2.

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