

May 22, 2020

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. ER20-____-000**

**Tariff Amendment to Enhance Intertie Transaction Market
Rules, Request for Waiver of Notice Requirement, and Request
for Timely Commission Order**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits this tariff amendment to enhance its market rules regarding the treatment of energy transactions scheduled at its interties.¹ Specifically, the CAISO proposes to: (1) enhance tariff provisions regarding the treatment of intertie schedules and related rules regarding electronic tags (E-Tags); (2) strengthen the CAISO's non-delivery charge for deviations from scheduled intertie transactions; and (3) clarify several aspects of the CAISO's day-ahead intertie scheduling practices. These tariff revisions will address problems the CAISO market has experienced due to significant amounts of undelivered intertie transactions, which the CAISO's existing non-delivery charge has not addressed sufficiently.

Although each of the three sets of proposed amendments will improve the reliability of the CAISO system and the stability of prices in the CAISO market, from a substantive perspective, they are each a separate element of a multi-part filing that is severable from the others and not interrelated, interdependent, or affected by the Commission's actions on any other element. Thus, the Commission should evaluate the justness and reasonableness of each set of proposed tariff changes based on their individual merits.

¹ The CAISO submits this filing pursuant to section 205 of the Federal Power Act (FPA), 16 U.S.C. § 824d.

The CAISO requests that the Commission issue an order by September 17, 2020, accepting the tariff revisions effective as of October 1, 2020. The CAISO also requests that the Commission waive its 120-day notice requirement. This will give the CAISO and market participants regulatory certainty and ample time to implement the tariff revisions as part of the CAISO's planned software release in the fall of 2020.

I. Executive Summary

The CAISO clears a significant volume of imports and exports through its markets. These transactions at the interties between the CAISO's balancing authority area and neighboring balancing authority areas are important to meet operational needs and provide economic benefits.² The CAISO has numerous tariff rules regarding how market participants schedule intertie transactions and how the CAISO financially settles these transactions. These rules include a monthly non-delivery charge assessed to scheduling coordinators for deviations from their intertie schedules. The CAISO intended the non-delivery charge, combined with generally applicable imbalance energy settlements, to incentivize scheduling coordinators to deliver their scheduled intertie transactions.

Failure to deliver awarded intertie transactions can detrimentally affect reliability and market pricing. Imports serve up to 25 percent of the supply needed in individual hours to meet demand in the CAISO balancing authority area. Where an import is undelivered, the CAISO must take immediate steps to ensure that load is served. An undelivered export causes the CAISO to have excess supply, which can cause intertie congestion and/or exacerbate over-supply conditions. When an import is scheduled through the hour-ahead scheduling process but is not delivered, the CAISO market has reserved transmission capacity for that undelivered import and cannot schedule another import to replace it until the next hour. Meanwhile, the CAISO must make up for the missing energy through internal generation. The supply of real-time energy available to the CAISO to offset this undelivered import may be more expensive. Thus, undelivered imports detrimentally affect market pricing because they tend to increase real-time prices. In addition, especially during stressed conditions, CAISO grid operators may need to take out-of-market actions in anticipation of undelivered imports. These include increasing the real-time market's load forecast and/or dispatching additional imports outside of the market. These actions, although needed to preserve reliability, can detrimentally affect market prices.

Despite having mechanisms intended to address these problems, the CAISO has observed significant amounts of awarded but undelivered energy at

² These imports/exports are separate from energy transfers between balancing authority areas participating in the CAISO's energy imbalance market (EIM) that result from resource-specific real-time market dispatches. See *generally* existing tariff section 29 *et seq.*

the interties. To address these continued problems, the CAISO proposes two sets of market rule changes:

1. Enhance the tariff provisions regarding how the CAISO markets treat E-Tagging information to more accurately reflect intertie energy that will be delivered.
2. Revise the existing, ineffective monthly non-delivery charge with a new under/over delivery charge that applies broadly to all intertie transactions for each interval of the fifteen-minute market (FMM) and eliminates the existing 10 percent monthly threshold for non-deliveries.

The CAISO optimizes the FMM assuming that a market participant will deliver a previously-awarded intertie transaction if the market participant signals it will do so through the CAISO's automated dispatch system, regardless of whether that participant has submitted the accompanying E-Tag. Through the first set of proposed rule changes, previously-awarded intertie transactions will be set to zero in the FMM if the participant does not submit E-Tags on a set timeline. Specifically, the CAISO proposes that participants must submit a valid E-Tag that matches the awarded amount by 40 minutes before the trading hour (T-40). If the scheduling coordinator has a transmission profile less than its advisory energy schedule, then the CAISO will limit the schedule for energy in the FMM so it does not exceed the quantity of the transmission profile. The energy profile on the E-Tag can be revised up to T-20, but by that point the energy profile must match the FMM award. These changes will better indicate to the CAISO's FMM whether scheduled intertie transactions will be delivered.

The CAISO's existing non-delivery charge for deviations from scheduled intertie transactions applies only in narrow circumstances. First, it only applies to hourly block schedules and variable energy resources outside the CAISO balancing authority area that use their own forecast. Fifteen-minute dispatchable intertie resources, for example, are not subject to the decline charge. Second, for hourly block schedules, it only applies if "the decline is made prior to the start of the applicable FMM interval."³ Third, the CAISO only applies the charge if the non-deliveries equal or exceed both: (i) 10 percent of the participant's monthly imports or exports; and (ii) 300 MWh. Where the charge does apply, it equals the megawatt-hours (MWh) of undelivered import or export energy multiplied by the greater of: (i) 50 percent of the locational marginal price (LMP) for the FMM; or (ii) \$10/MWh. Experience shows that the current charge creates insufficient incentives for market participants to deliver scheduled intertie transactions, and too many undelivered intertie transactions are not even subject to the charge.

³ Existing tariff sections 11.31(a) and 11.31(b).

The second set of market rule changes proposed in this filing addresses the deficiencies in the existing non-delivery charge. The CAISO proposes the following key revisions to these rules:

- The non-delivery charges will apply to all intertie transactions regardless of the bid type that created the schedule.
- Charges will apply to deviations from awarded amounts regardless of whether the deviation is an over- or under-delivery. This change recognizes that over-deliveries at the interties can also cause reliability challenges and have detrimental economic impacts.
- The CAISO will eliminate the 10 percent/300 MWh threshold and instead assess charges for each FMM interval.
- Over- and under-deliveries will be exempt only in three limited and justifiable circumstances: (1) a balancing authority or transmission service provider curtailed delivery for a reliability reason; (2) the deviation was part of a valid existing transmission contract or transmission ownership right self-schedule; or (3) the deviation was from a dynamic system resource.
- The under/over delivery price will equal the greater of: (a) 50 percent of the LMP in the corresponding FMM interval at the intertie where the resource was scheduled; (b) 50 percent of the highest LMP among the three five-minute real-time dispatch (RTD) intervals corresponding to the FMM interval at the intertie where the resource was scheduled; or (c) \$10.00 MWh. When a scheduling coordinator accepts an award in the CAISO's automated dispatch system but then fails to deliver, the values in (a) and (b) will equal 75 percent, instead of 50 percent, of the applicable price.

These revisions will establish more robust incentives for market participants to deliver their scheduled intertie transactions.

In addition to these two major sets of tariff amendments, the CAISO also proposes to clarify the tariff provisions that address day-ahead intertie scheduling practices to align them better with the CAISO's business practice manual configuration guide.

II. Background

A. Existing Tariff Provisions

1. Scheduling Intertie Transactions

The CAISO administers day-ahead and real-time wholesale electricity markets.⁴ The real-time market consists of the hour-ahead scheduling process (HASP), the FMM, and the five-minute RTD.⁵

The CAISO uses the HASP and the FMM to schedule transactions on interties, *i.e.*, imports into the CAISO balancing authority area from another balancing authority area, or exports out of the CAISO balancing authority area to another balancing authority area.⁶ Intertie schedules result from both economic bids (*i.e.*, bids which specify prices) and self-schedules (*i.e.*, price-taking bids) that scheduling coordinators submit to the real-time market under various options that include:

- Economic bids in hourly blocks (*i.e.*, bids the scheduling coordinator maintains at the same value for an entire operating hour);⁷
- Economic bids in hourly blocks with an option to make a single intra-hour schedule change;⁸

⁴ Existing tariff section 27 *et seq.*; tariff appendix A, existing definitions of “CAISO Markets” and “CAISO Markets Process.” For the sake of clarity, this transmittal letter distinguishes between existing tariff provisions (*i.e.*, provisions in the current CAISO tariff), new tariff provisions (*i.e.*, new provisions that the CAISO proposes to add to the tariff in this filing), revised tariff provisions (*i.e.*, existing tariff provisions that the CAISO proposes to revise in this filing), and deleted tariff provisions (*i.e.*, existing tariff provisions that the CAISO proposes to delete in this filing).

⁵ Existing tariff section 34. The CAISO implemented its current real-time market design pursuant to an amendment it filed in Docket No. ER14-480 to make tariff enhancements related to Commission Order No. 764. *Integration of Variable Energy Resources*, Order No. 764, FERC Stats. & Regs. ¶ 31,331, *order on reh'g*, Order No. 764-A, 141 FERC ¶ 61,232 (2012), *order on reh'g*, Order No. 764-B, 144 FERC ¶ 61,222 (2013) (collectively Order No. 764).

⁶ Existing tariff sections 34.2 *et seq.* and 34.4. In this filing, transactions conducted at internal nodes are sometimes referred to as internal transactions, and the resources that engage in them are sometimes referred to as internal resources. Similarly, in this filing transactions conducted on interties are sometimes referred to as intertie transactions and the resources that engage in them are sometimes referred to as intertie resources.

⁷ An operating hour means an hour during a day when the real-time market runs and energy is supplied to load. Tariff appendix A, existing definition of “Operating Hour.”

⁸ The CAISO plans to remove this option pursuant to its day-ahead market enhancements initiative, which is planned to go into effect in the fall of 2021.

- Economic bids with participation in the FMM (*i.e.*, fifteen-minute dispatchable inertie resources);
- Self-schedules in hourly blocks;
- Self-schedules by variable energy resources (*i.e.*, intermittent resources), based on forecasts produced by either the variable energy resources or the CAISO; and
- Non-EIM transfers by dynamically scheduled system resources (*i.e.*, resources located outside of the CAISO balancing authority area that are able to respond to RTD instructions).⁹

The schedules also include inertie transactions initially scheduled in the day-ahead market.¹⁰

The real-time market conducts a multi-interval optimization for each of the real-time market processes. Therefore, each real-time market run produces results for multiple market intervals. The HASP operates at the top of each hour for the next hour and produces advisory schedules for both hourly block bids and fifteen-minute dispatchable inertie bids for the next hour. The advisory HASP schedules indicate how much transmission the CAISO market has reserved for energy delivered because of a cleared import or export economic bid or self-schedule.¹¹ The FMM begins 37.5 minutes before each fifteen-minute interval and produces final schedules and prices (*i.e.*, market awards) 22.5 minutes before that interval.¹² This timeline is significant because it differs from the North American Energy Standards Board (NAESB) deadline requiring all E-Tags be submitted 20-minutes before the corresponding interval. E-Tag schedule changes are not recognized by the CAISO market when they occur between 37.5 minutes before the interval (FMM determination of final schedule) and 20 minutes before the interval (NAESB deadline). This may cause over- or under-delivery of import/export energy and may adversely affect grid reliability and efficient market pricing.

To deliver an inertie transaction, a scheduling coordinator submits an E-Tag to the CAISO and to the other balancing authority area(s) involved in the transaction.¹³ Balancing authority areas use E-Tags to track energy transfers

⁹ Existing tariff sections 30.5.1(q)-(u), 34.1.3, 34.2.1, and 34.2.2.

¹⁰ Existing tariff section 34.1.1.

¹¹ Existing tariff sections 27, 27.4.1, 34.2 *et seq.*, and 34.3 *et seq.*

¹² Existing tariff section 34.4.

¹³ Existing tariff sections 4.5.3.2.2 and 30.5.7 *et seq.*; tariff appendix A, existing definition of “E-Tag.” An inertie transaction for which there is an E-Tag is sometimes referred to as being

among themselves. E-Tags include a “transmission profile” and an “energy profile.” The transmission profile shows the amount and location of the transmission the scheduling coordinator has available to facilitate the energy transaction. The energy profile shows the amount of energy to be delivered to complete the intertie transaction.¹⁴ CAISO grid operators validate a scheduling coordinator’s E-Tag information to ensure the energy quantity on the E-Tag matches the CAISO market scheduled energy.

Under both Western Electricity Coordinating Council (WECC) and CAISO rules, final E-Tags supporting scheduling coordinators’ intertie transactions, including both the transmission and energy profiles, are due by 20 minutes before the applicable trading hour or fifteen-minute interval (T-20).¹⁵ The existing rules also require the transmission profile to equal or exceed the energy profile (or, for a fifteen-minute dispatchable economic bid, to equal or exceed the maximum bid-in capacity for the trading hour¹⁶), and require the energy profile to equal the market award resulting from the economic bid or self-schedule. The CAISO may modify the energy profile for reliability-related curtailments.¹⁷

Imports and exports are financially settled in the day-ahead market and in the FMM. An import or export scheduled in the FMM that is not delivered is also settled in the five-minute real-time market. As described above, the HASP operates at the top of each hour for the next hour and produces advisory schedules for the next hour. These are based on the HASP price, but imports and exports scheduled in HASP are settled at the FMM price, with any deviations from the FMM schedule settled at the five-minute RTD price. Similarly, where an intertie resource has a day-ahead award, the day-ahead award quantity is settled

“tagged,” and an intertie transaction for which there is no E-Tag is sometimes referred to as being “untagged.”

¹⁴ Business practice manual (BPM) for market operations (version 63) at section 8.4.1. This document is available at <https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Market%20Operations>. For example, an E-Tag may depict a 100 megawatt (MW) transaction whose energy source is in the Bonneville Power Administration balancing authority area and whose energy sink is in the CAISO balancing authority area across the MALIN500 intertie for HE10. In this example, the E-Tag has an energy profile of 100 MW to match the CAISO market award. The E-Tag also has a transmission profile of at least 100 MW to indicate that the scheduling coordinator has procured sufficient transmission to accommodate the energy transfer across the specified intertie for the hour ending at 10:00 a.m.

¹⁵ Existing tariff sections 30.5.7 – 30.5.7.5; BPM for market operations at section 8.5.2; NERC Tagging Requirements, CAISO Operating Procedure No. 2510 (version 8.4) at 4, 7, which is available at <http://www.caiso.com/Documents/2510.pdf>. The North American Energy Standards Board (NAESB) establishes the required specifications for E-Tags.

¹⁶ A trading hour is any hour during which trades are conducted in a CAISO market. Tariff appendix A, existing definition of “Trading Hour.”

¹⁷ Existing tariff sections 30.5.7.1 – 30.5.7.5.

at the day-ahead price, with differences between the day-ahead and FMM schedules paid or charged at the FMM schedule.

The exposure to imbalance energy settlement only partially incentivizes intertie resources to deliver on their import and export intertie schedules, and experience shows it has not deterred under-deliveries at the interties. All else being equal, an intertie resource that does not deliver in real-time would have to buy back its schedule at a higher price than it was paid because the later markets would have to make up the missing energy from a smaller pool of resources or from resources with higher bids. The imbalance energy settlement, however, is not fully effective when an import or export only schedules in the CAISO's real-time market process. The HASP produces schedules, but it does not produce financial settlements for imbalance energy. It is possible for an import or export to be scheduled in the HASP without having received a DAM award. If the import or export fails to deliver the scheduled HASP energy, it is too late for the FMM to account for that non-delivery in the first two fifteen-minute intervals of that hour, and the FMM cannot zero out the market schedule until the third and fourth fifteen-minute intervals of the hour. Thus, only the first and second intervals have an imbalance settlement; the third and fourth do not. Absent other measures (such as the existing non-delivery charge), there is no financial consequence in half of the hour for having failed to deliver on the HASP schedule. This differs from the treatment accorded generation resources internal to the ISO balancing area, which are always subject to imbalance energy charges.

2. Non-Delivery Charge for Intertie Transactions

Besides imbalance energy settlement, the existing CAISO tariff includes a monthly non-delivery charge for deviations from scheduled intertie transactions.¹⁸ To determine the non-delivery charge, the CAISO first calculates separate "decline potential charges" for import schedules and for export schedules resulting from the hourly block options described above. The CAISO does not, however, calculate decline potential charges (and thus does not calculate non-delivery charges) for fifteen-minute dispatchable economic intertie bids, self-schedules by variable energy resources located outside of the CAISO balancing authority area based on forecasts produced by the CAISO, or dynamically scheduled transfers.¹⁹ For each settlement interval during the month, the decline

¹⁸ Existing tariff section 11.31 *et seq.* The CAISO's Draft Final Proposal, included as Attachment C, provides detailed examples of how the existing decline charge interacts with the existing E-Tagging rules and market timelines. Attachment C, at 20-27.

¹⁹ Existing tariff section 11.31; tariff appendix A, existing definitions of "Decline Potential Charge – Imports" and "Decline Potential Charge – Exports." The word "decline" in the term "decline potential charge" (and in the term "define monthly charge" discussed below) refers to scheduling

potential charge equals the megawatt-hours (MWh) of undelivered import or export energy multiplied by the greater of (i) 50 percent of the locational marginal price (LMP) for the FMM or (ii) \$10/MWh.²⁰

At the end of the month, the CAISO calculates “decline monthly charges” for imports and exports equal to the total decline potential charges for the month multiplied by a ratio that represents the portion of the scheduling coordinator’s declined schedules that exceeded a specified exemption threshold. Specifically, the decline monthly charges only apply if the scheduling coordinator’s undelivered amount of imports or exports for the month equals or exceeds both: (i) 10 percent of the total scheduling coordinator’s monthly imports or exports; and (ii) 300 MWh.²¹ When the CAISO first proposed the decline potential charges in 2008, the CAISO explained this threshold was necessary because some declines were outside a scheduling coordinator’s control, *e.g.*, reliability-related curtailments ordered by a balancing authority area.²² The CAISO considered providing exemptions from the charge in such cases but found that “it would be impossible as a practical matter to evaluate the circumstances of numerous individual declines, as would be necessary if the rule contained exceptions for declines based on certain specific causes.”²³ The CAISO settled on these threshold amounts as a reasonable way to account for declines outside the scheduling coordinator’s control.

The CAISO distributes whatever charges it assesses to measured demand. On the settlement statements the CAISO issues for the last day of the month, each scheduling coordinator receives a credit for its share of the total of all decline monthly charges for imports and exports assessed to scheduling coordinators for the month. The CAISO allocates the credits according to the proportion of each scheduling coordinator’s measured CAISO demand to total measured CAISO demand for the CAISO balancing authority area during the month.²⁴

When the Commission accepted the CAISO’s 2008 tariff filing proposing the decline monthly charge in 2008, it found the “CAISO’s proposed penalty

coordinators fully or partially declining (*i.e.*, not delivering on) dispatches for import or export energy.

²⁰ Existing tariff section 11.31(d).

²¹ Existing tariff sections 11.31.1 – 11.31.2; tariff appendix A, existing definitions of “Decline Monthly Charge – Imports,” “Decline Monthly Charge – Exports,” “Decline Threshold Percentage – Imports/Exports,” and “Decline Threshold Quantity – Imports/Exports.”

²² *Cal. Indep. Sys. Operator Corp.*, Transmittal Letter, FERC Docket No. ER09-628-000 (Feb. 29, 2008).

²³ *Id.* at 6.

²⁴ Existing tariff section 11.31.3.

mechanism for minimizing excessive pre-dispatched bid declines reasonably balances market flexibility with the need to maintain reliable grid operations.”²⁵ The Commission also accepted the monthly 10 percent threshold, but stated it:

expect[s] CAISO will continue to monitor the level of pre-dispatched bid declines. If the situation does not improve, we will remain open to further remedies, including a tightening of the threshold, an increase in the level of charges assessed, or a more granular approach to the basis for the threshold.²⁶

When the monthly decline charge was originally implemented in 2008, it was impossible for the CAISO to identify if a curtailment occurred due to reliability reasons. Because the CAISO could not identify reliability curtailments, the 10 percent threshold was necessary and appropriate.

3. Measures to Address Intertie Scheduling Practices

Separate from the “decline potential charges,” the existing tariff specifies several actions the CAISO will take regarding schedules that clear the day-ahead market at the interties and are wholly or partially reversed through an FMM schedule.²⁷ One of these tariff provisions states that the CAISO will charge a scheduling coordinator the positive difference between the day-ahead market price and the FMM LMP applicable to any imports that clear the day-ahead market and are reduced through a bid to the real-time market, if the scheduling coordinator withdraws an E-Tag more than 45 minutes before the trading hour.²⁸ This tariff rule reduces the economic incentive for implicit virtual bidding.

B. Reasons for Revising the Existing Tariff Provisions

The CAISO market has experienced significant amounts of undelivered intertie transactions over several years. Failure to deliver awarded intertie transactions can have detrimental impacts on both reliability and pricing for the CAISO markets.

²⁵ *Cal. Indep. Sys. Operator Corp.*, 123 FERC ¶ 61,097, at P 27 (2008) (2008 Order). The 2008 Order conditionally accepted the CAISO’s tariff revisions subject to a further compliance filing, which the Commission accepted by letter order issued on October 15, 2008 in Docket No. ER08-628-001. The CAISO made conforming changes to the decline charge tariff provisions in Docket No. ER14-480 as part of implementing its FMM.

²⁶ 2008 Order at PP 27, 30. Further, the Commission expressly approved the 300 MWh threshold. *Id.* at P 32.

²⁷ Existing tariff section 11.32. These tariff provisions are sometimes collectively referred to as the “HASP reversal settlement rule.” The Commission accepted the tariff provisions (as subsequently revised) as “an important deterrent against implicit virtual bidding.” *Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,204, at P 56 (2014).

²⁸ Existing tariff section 11.32(i).

Regarding reliability impacts, the CAISO relies on intertie transactions for up to 25 percent of the supply needed in individual hours to meet demand in the CAISO balancing authority area. An undelivered *import* causes the CAISO to be short of that needed supply. An undelivered *export* causes the CAISO to have excess supply, which can cause intertie congestion and/or exacerbate over-supply conditions.

Undelivered imports are a particular concern because the CAISO market has reserved transmission capacity for the undelivered import and may not be able to schedule another import to replace it until the next hour. Hourly imports are scheduled through the HASP, so if an hourly import is not delivered, the HASP cannot schedule another import because once the market recognizes the shortage, the HASP has already been completed and will not run again until the following hour. The CAISO balancing authority area operator may elect to schedule hourly energy on the interties manually. This process, however, is time consuming, and additional energy may not be available. Also, often it is too late to manually schedule energy on the interties because there is insufficient time for the operator to verbally agree with the scheduling coordinator on the manual schedule and for the scheduling coordinator to submit an E-Tag. The FMM may be able to dispatch fifteen-minute dispatchable imports to compensate, but it will not do this until the last two fifteen-minute intervals in the hour, and only if additional fifteen-minute dispatchable imports are available.

So when imports are not delivered, the five-minute RTD may have to compensate for the undelivered import by dispatching replacement supply from a smaller overall supply of five-minute dispatchable resources. The overall supply available to the five-minute RTD is smaller than the supply available to the FMM because the vast majority of intertie energy resources cannot participate in the five-minute RTD. Only internal generators, EIM participating resources, and dynamically scheduled intertie energy resources can participate in the CAISO's five-minute RTD market.

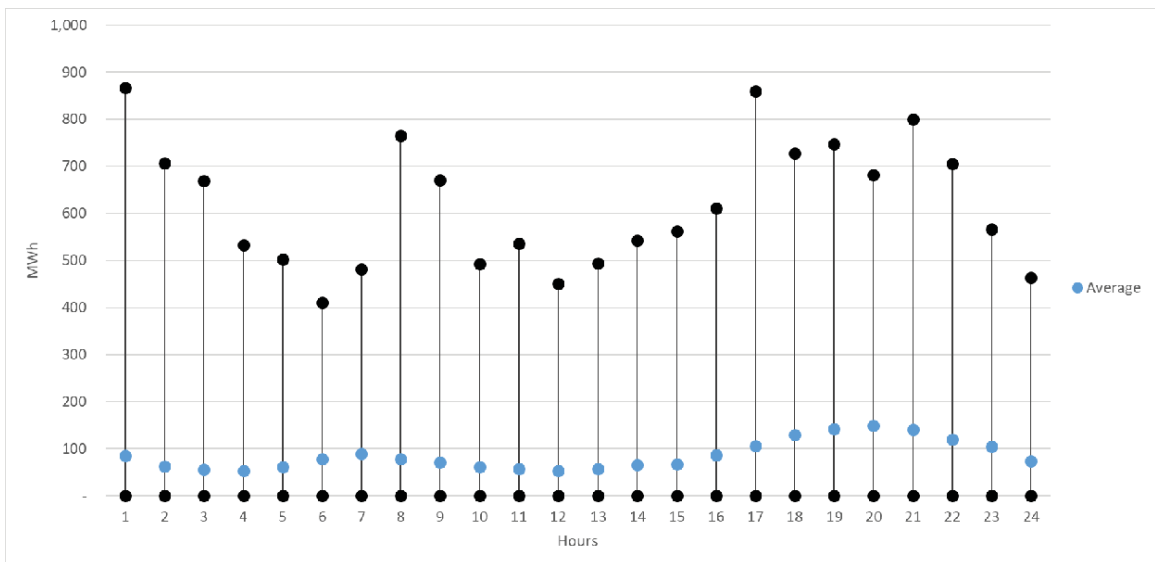
Undelivered imports are detrimental to market pricing because the smaller supply of energy from which the RTD can dispatch may be more expensive, thus increasing RTD prices, all other things being equal.²⁹ These increased prices affect all market participants and likely cause higher prices than would occur if the market could have selected from a broader range of resources in the HASP and the FMM. Despite causing a detrimental impact to the CAISO's reliability and market pricing, the undelivered intertie schedule is not currently charged for the decline charge unless the scheduling coordinator exceeds the ten percent monthly threshold. Additionally, the import or export that caused the deviation may not receive imbalance energy settlements for half of the hour if, as

²⁹ Undelivered imports can also necessitate exceptional dispatches, which, per CAISO tariff section 43A, can trigger capacity procurement mechanism designations when issued to non-resource adequacy capacity.

discussed above in Section II.A.1, it scheduled in the HASP as opposed to the DAM.

The CAISO has documented the large amounts of undelivered inertia energy the markets have experienced. For example, Figure 1 below depicts the range of undelivered inertia import supply from July 2017 through June 2018 for each hour of the set of days within that year-long period.³⁰ The trends reflected in this figure have continued to the present.

Figure 1



For each hour of the set of days within the year-long period, as shown in the horizontal axis of Figure 1, the black circle at the top of the vertical segment represents the largest amount of undelivered inertia import supply, the black circle at the bottom of the vertical segment represents the smallest amount of undelivered inertia import supply, and the blue circle within the vertical segment represents the average amount of undelivered inertia import supply. Figure 1 shows that the range of undelivered inertia supply can reach significant amounts, with average non-delivery increasing during peak load hours when the CAISO has the greatest need for the energy, *i.e.*, in the morning hours and to a greater extent in the evening hours. CAISO balancing authority area operators must plan for the worst case scenario, and often must take manual actions in anticipation of large quantities of undelivered inertia schedules during peak hours. If they fail to do so and the worst case scenario materializes, it can be impossible to schedule or dispatch additional supply. This may cause

³⁰ Figure 1 and Figure 2 are drawn from the CAISO's Draft Final Proposal provided in attachment C to this filing.

emergency situations. In summary, even if a grid operator is capable of managing the average amount of undelivered import or export energy, the operator must prepare for the worst case scenario to avoid potential grid emergencies.

Undelivered inertia supply also has contributed to system emergency situations and threatened grid stability. For example, the CAISO declared an “Emergency Stage 1” on May 3, 2017, in part because of undelivered imports during the peak load hours. This is the type of emergency the CAISO declares when contingency reserve shortfalls exist, or when such shortfalls are forecasted to occur, and market and non-market resources cannot maintain contingency reserve requirements.³¹ In addition, on September 1-2, 2017, the CAISO and many surrounding balancing authority areas experienced a heat wave that triggered high regional loads. When tight regional conditions occur, market participants can be more likely to sell their energy outside of the CAISO even if the import energy has been bid and scheduled into the CAISO. The market participant may elect not to deliver the energy to the CAISO and instead sell at a higher price somewhere else. This exacerbates potential reliability emergencies for the CAISO because the CAISO depended on the import energy.

CAISO grid operators often must take action in anticipation of undelivered inertia transactions to ensure adequate supply is available to meet real-time system needs. These measures include increasing the load forecast the market uses for the HASP and/or FMM to schedule additional imports and exceptionally dispatching additional imports out of the market. Although grid operators take these measures to assure system reliability, they can also introduce pricing differences between the DAM, FMM, and RTD. This can diminish incentives for scheduling coordinators to deliver their scheduled inertia transactions because the market initially schedules them in the HASP based on its prices, but they are financially settled at FMM and/or RTD prices.

A negative feedback loop occurs when operators adjust the load forecast in HASP, but not FMM, in anticipation of undelivered hourly imports because this can result in HASP prices being greater than FMM prices. As described earlier, the real-time market dispatches hourly imports based on HASP prices, but they are settled at the FMM prices. If HASP prices are significantly greater than the FMM price, this can create an incentive for importers not to deliver because they may be paid less than their bid. This can result in a negative feedback loop, in which undelivered imports cause operators to further increase the load forecast in HASP in anticipation of undelivered imports, making HASP prices even higher in relation to FMM prices, and incentivizing even more imports to not be delivered.

³¹ See CAISO Operating Procedure No. 4420 (version 12.1) at 9, available at <http://www.caiso.com/Documents/4420.pdf>.

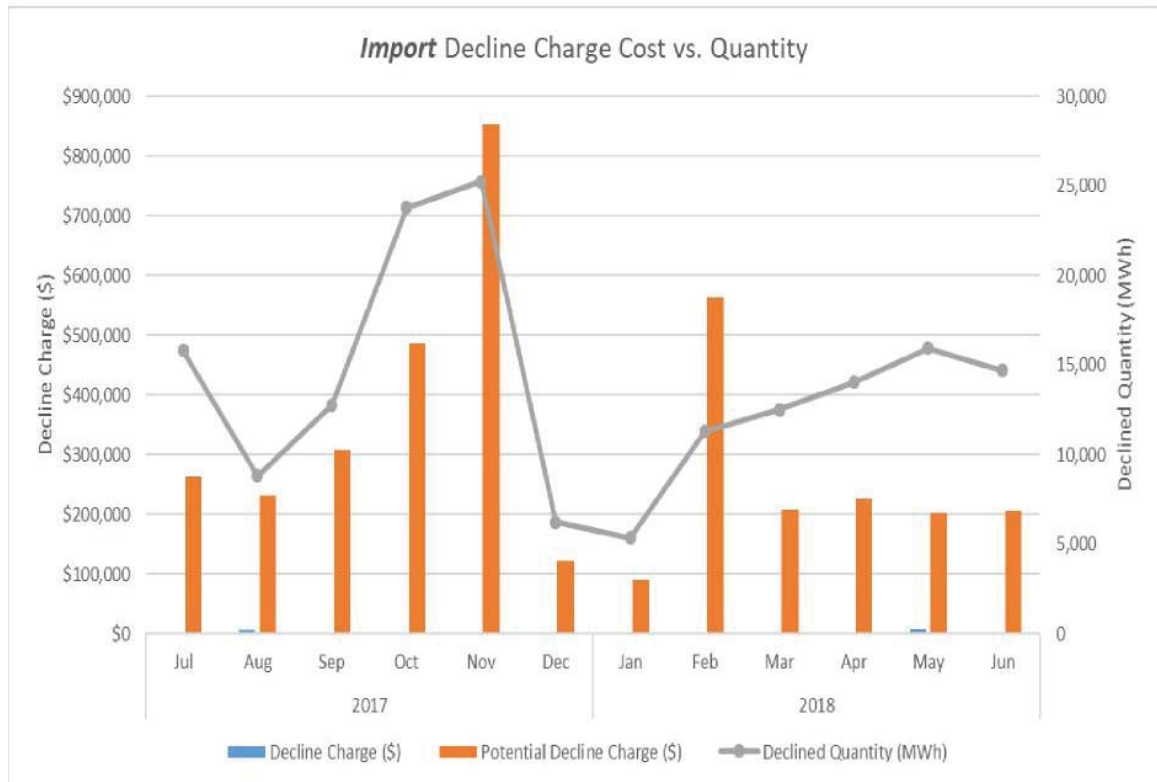
Measures that reduce schedule deviations at the interties and alleviate the need for grid operators to undertake these actions are needed.

The existing monthly non-delivery charge creates an insufficient incentive for scheduling coordinators to deliver their scheduled intertie transactions. There are two related reasons for this. First, the calculation of undelivered intertie transactions rarely exceeds the 10 percent threshold in the tariff and, as such, market participants are rarely charged for under-deliveries. Because of this threshold, the existing non-delivery charge does not set effective incentives for scheduling coordinator to deliver their scheduled volumes at the interties. For example, Figure 2, below, depicts the calculation of decline potential charges and actual decline monthly charges from July 2017 through June 2018. This figure shows extensive under-delivered volumes, but only *de minimis* under-delivery charges actually being imposed. This is a stark demonstration of the existing under-delivery charge's ineffectiveness at deterring intertie schedule deviations.

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Figure 2

IMPORTS Date	Decline Charge (\$)	Decline Charge as % of Potential	Potential Decline Charge (\$)	Declined Quantity (MWh)
2017	\$ 5,886	0.26%	\$ 2,265,863	92,706
Jul-17	\$ -	0.00%	\$ 263,560	15,827
Aug-17	\$ 5,886	2.55%	\$ 231,042	8,812
Sep-17	\$ -	0.00%	\$ 309,106	12,772
Oct-17	\$ -	0.00%	\$ 487,151	23,800
Nov-17	\$ -	0.00%	\$ 853,499	25,258
Dec-17	\$ -	0.00%	\$ 121,505	6,237
2018	\$ 7,815	0.52%	\$ 1,495,763	73,867
Jan-18	\$ -	0.00%	\$ 91,105	5,346
Feb-18	\$ -	0.00%	\$ 562,312	11,302
Mar-18	\$ -	0.00%	\$ 208,247	12,507
Apr-18	\$ -	0.00%	\$ 225,683	14,055
May-18	\$ 7,815	3.87%	\$ 201,958	15,954
Jun-18	\$ -	0.00%	\$ 206,458	14,704
Grand Total	\$ 13,701	0.36%	\$ 3,761,626	166,573



As shown in Figure 2, scheduling coordinators exceeded the 10 percent threshold for imports in only two months (August 2017 and May 2018) of that year-long period. Even in those two months, the decline monthly charge

amounts (depicted using the blue bars) were negligible – \$5,886 in August 2017 and \$7,815 in May 2018. The decline monthly charge amounts were also much smaller than the decline potential charge amounts (depicted using the orange bars) for those months – \$231,042 and \$201,958, respectively. The decline monthly charge amounts assessed for all of 2017 and 2018 were only a tiny percentage of the decline potential charge amounts that could have been (but were not) applied for those two years – 0.26 percent and 0.52 percent, respectively. Using the 10 percent threshold means the existing non-delivery charge fails to deter scheduling coordinators from falling short of delivering on their intertie schedules.

The second reason the existing non-delivery charge is ineffective is that applying the charge over each month masks stressed periods when intertie transaction non-delivery is most impactful to the CAISO. For example, a scheduling coordinator may fail to deliver import energy during a heat wave when pricing is high and supply is scarce. This will negatively affect the CAISO, but if the scheduling coordinator has not exceeded the 10 percent monthly threshold, it will not be assessed a monthly decline charge.

C. Stakeholder Process Preceding This Tariff Amendment

The CAISO initiated the stakeholder process that led to this tariff amendment in August 2018.³² The stakeholder process included the following opportunities for stakeholder input and participation:

- The CAISO issued four papers;³³
- The CAISO held several stakeholder meetings and conference calls to discuss the issues raised in the CAISO papers and provided opportunities for stakeholders to submit comments on the papers;
- The CAISO developed draft tariff revisions; and
- The CAISO provided stakeholders the opportunity to submit written comments on the draft tariff provisions, which the CAISO considered in preparing the final version of the tariff revisions.³⁴

³² Materials related to the stakeholder process are available at <http://www.caiso.com/StakeholderProcesses/Intertie-deviation-settlement>.

³³ These papers included the Draft Final Proposal provided in attachment C to this filing.

³⁴ A list of key dates in the stakeholder process is provided in attachment E to this filing.

The CAISO Governing Board (Board) voted unanimously to authorize this filing at its public meeting held on February 7, 2019.³⁵ At that point, the CAISO's intent was to implement this initiative through its Fall 2019 software release. Implementation subsequently was rescheduled for the Fall 2020 software release.

Stakeholders generally supported the policies reflected in this tariff amendment. However, some stakeholders objected to certain features. In addition, the Market Surveillance Committee (MSC) and the Department of Market Monitoring (DMM) each stated that the policies improve upon the existing CAISO tariff rules.³⁶ The CAISO addresses any objections to its proposals below in section IV of this transmittal letter.

III. Proposed Tariff Revisions

The CAISO proposes targeted tariff enhancements to address significant amounts of undelivered intertie transactions the CAISO market experiences and the fact the existing non-delivery charge does not deter such non-deliveries sufficiently.³⁷ Specifically, this tariff amendment contains enhancements to: (1) the treatment of intertie schedules and the market inputs and processing related to E-Tag rules; and (2) the non-delivery charge for deviations from scheduled intertie transactions. The first category of changes will provide the FMM with more reliable information about whether intertie transactions awarded from day-ahead and HASP are likely to materialize in real-time. The second category of changes increases incentives for market participants to deliver awarded intertie

³⁵ Materials related to the Board's authorization are available at <http://www.caiso.com/informed/Pages/BoardCommittees/BoardGovernorsMeetings.aspx>. These materials included a memorandum to the Board from Keith Casey, Vice President, Market & Infrastructure Development (Board Memorandum), which is provided in attachment D to this filing. The EIM Governing Body also issued a memorandum supporting the proposed tariff changes. See <http://www.caiso.com/Documents/Decision-IntertieDeviationSettlementProposal-EIMGBInput-Feb2019.pdf>.

³⁶ See MSC Opinion on Intertie Deviation Settlements, at 4 (Jan. 16, 2019) (MSC Opinion) (stating that "the implementation of stronger incentives for the delivery of scheduled intertie transactions is desirable, and, on balance, we recommend the adoption of the proposed changes"). The MSC Opinion is available at <http://www.caiso.com/Documents/Decision-IntertieDeviationSettlementProposal-MSCOpinion-Feb2019.pdf>. See also DMM Comments on Intertie Deviation Proposal at 1 (Feb. 4, 2019) (DMM Comments) (stating that DMM "supports the proposal as an improvement over the current market design. These changes should increase the reliability of import schedules and reduce uncertainty about imports that may not be delivered in the real-time market."). The DMM Comments are available at http://www.caiso.com/Documents/Decision_IntertieDeviationSettlementProposal-DMM_Comments-Feb2019.pdf.

³⁷ See *supra* section II.B of this transmittal letter.

transactions. Besides these two categories of tariff revisions, the CAISO proposes to clarify certain tariff provisions regarding intertie scheduling practices.

A. Enhance the Treatment of Intertie Schedules and the Market Inputs and Processing Regarding E-Tag Rules

The FMM assumes that a scheduling coordinator will deliver its scheduled intertie transaction if it indicates as such through the CAISO's automated dispatch system after the HASP is completed,³⁸ regardless of whether the scheduling coordinator has submitted an E-Tag. This creates issues for the CAISO market because indications of intent to deliver provided through the automated dispatch system are less firm than when such intentions are reflected through an E-Tag. To address this, the CAISO proposes to amend its tariff provisions regarding the treatment of intertie schedules and the E-Tag rules applicable to the economic bidding and self-scheduling option to more accurately reflect intertie transactions that will be delivered.³⁹

Specifically, the CAISO proposes modifications to its market processes based on submitted E-Tags. Intertie transactions that do not follow these rules will have their prior market awards set to zero in the FMM.⁴⁰ First, the CAISO proposes to require scheduling coordinators to submit E-Tags that pass the CAISO E-Tag validation procedures and support their market awarded economic bids and self-schedules, by 40 minutes before the trading hour (T-40). The transmission profile of the E-Tag at T-40 must equal the applicable economic bid or self-schedule (or, for an FMM economic bid, to be equal to or greater than that bid). If the scheduling coordinator has a transmission profile less than its advisory energy schedule, then the CAISO will limit the schedule for energy in the FMM so it does not exceed the quantity of the transmission profile.⁴¹ As discussed above,⁴² the FMM begins 37.5 minutes before each fifteen-minute interval and produces final schedules and prices 22.5 minutes before that interval. Thus, the tariff revisions will allow the CAISO to base the FMM schedules on the preliminary E-Tags with transmission profiles submitted by T-

³⁸ After the CAISO publishes the results of HASP, any scheduling coordinator with an awarded schedule has approximately five minutes to either accept, partially accept, or decline the award.

³⁹ Revised tariff sections 30.5.7.1 – 30.5.7.5. The CAISO also proposes to make non-substantive corrections to the use of defined terms in tariff section 30.5.7.

⁴⁰ Such transactions also would be subject to the under/over delivery charge described in section III.B, below.

⁴¹ Further, for an economic hourly block bid with an intra-hour option, the MW level to which the FMM can redispatch the bid above its HASP advisory schedule, pursuant to the CAISO's existing authority to redispatch such a bid, will be limited to the quantity of the transmission profile submitted by T-40.

⁴² See *supra* section II.A.1 of this transmittal letter.

40.⁴³ This will help the CAISO by basing the FMM market optimization on a more realistic view of what intertie schedules actually will materialize.

Second, the tariff revisions will allow a scheduling coordinator to revise an energy profile up to T-20, but the quantity of the energy profile must equal the quantity of the economic bid or self-schedule (or, for an FMM economic bid, must equal the quantity of the FMM energy schedule) by T-20. This is consistent with the NAESB E-Tagging deadline of T-20. If the scheduling coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM schedule associated with the economic bid or self-schedule to zero for each FMM interval of the hour.⁴⁴

These tariff enhancements will address issues that result from the timing of the CAISO market runs. Currently, the FMM binding award for hourly block intertie resources is equal to the HASP award accepted in the automated dispatch system after, under normal circumstances. This is problematic because the FMM assumes an E-Tag will be submitted to match the market award even though there is no guarantee of an E-Tag submission. If a scheduling coordinator fails to submit an E-Tag by T-20, it is too late for the HASP to schedule additional energy. In this situation, the CAISO is not only short energy (or in an energy surplus if an export is not tagged), but the reserved transmission capacity for the resource may go unused, unless a fifteen-minute dispatchable import or export can use that transmission capacity. Untagged energy can cause FMM prices to be lower than they should have been and RTD prices to be higher than they should have been. As discussed *supra*, at least for the first two fifteen-minutes of the hour, the FMM would have cleared at a higher price had the market optimization known the awarded energy would not be delivered. Replacing the energy results in a price increase in the real-time market and, if the real-time market cannot replace the energy, the CAISO may experience reliability problems.

⁴³ Early in the stakeholder process for this tariff amendment, the CAISO had proposed a firm real-time E-Tag deadline of T-40. This would require submission of all E-Tags including energy and transmission profiles by T-40, which is 20 minutes prior to the NAESB E-Tagging deadline of T-20. The CAISO proposed that no changes to the E-Tag could occur after T-40. The intent behind that proposal was to ensure that E-Tags would be submitted and approved in advance of the FMM runs, each of which begins 37.5 minutes before the applicable 15-minute interval. However, stakeholders noted seams issues with the rules in other balancing authority areas that the CAISO determined would make the proposal impracticable. Therefore, the CAISO withdrew that proposal. See Draft Final Proposal at 4-5, 41.

⁴⁴ In addition, a scheduling coordinator with a cleared FMM economic bid may update either the transmission profile or the energy profile after the relevant deadlines. A scheduling coordinator choosing to update its transmission profile or its energy profile must submit that update by T-40 or T-20, respectively.

Submitting an E-Tag with a transmission profile under the proposed tariff revisions will provide the CAISO with a sufficient indicator that the scheduling coordinator intends to deliver the awarded energy. If a valid E-Tag is submitted, it is appropriate for the FMM to assume the energy will most likely be delivered. This aligns with how the CAISO market determines awards for fifteen-minute dispatchable intertie resources, which must submit E-Tags with transmission profiles before the FMM run.⁴⁵ If no E-Tag is submitted, the resource does not receive an award.

Going forward, the CAISO proposes to make award determinations for all imports and exports based on the submission of an E-Tag, as opposed to assuming an E-Tag will be submitted to match the market award. This change will allow the FMM to schedule imports and exports based on what is actually tagged rather than what the CAISO merely assumes will be tagged. The change will also encourage scheduling coordinators to have physical generation and transmission procured when they submit bids. Assuming the bid clears, the CAISO expects the associated energy to be delivered. If a scheduling coordinator cannot tag the energy before the market run, the CAISO market will no longer assume this energy will be delivered.

B. Enhance the Non-Delivery Charge for Deviations from Scheduled Intertie Transactions

The CAISO also proposes to enhance the incentives for scheduling coordinators to deliver their scheduled intertie transactions by replacing the existing monthly non-delivery charge with a new, more robust type of charge called the “under/over delivery charge.”⁴⁶ As its name indicates, the under/over delivery charge will apply not only to under-deliveries of scheduled intertie energy but also to over-deliveries of such energy. This change is appropriate and necessary because both under- and over-deliveries represent deviations from scheduled intertie transactions, and must be made up for with the re-dispatch of supply in the five-minute RTD market. Additionally, the new charge is necessary because the existing imbalance energy settlement is ineffective on its own when intertie energy is scheduled in the HASP but not delivered.

Under the tariff revisions, for each FMM interval, the CAISO will assess an under/over delivery charge to a scheduling coordinator with an intertie

⁴⁵ See existing tariff section 30.5.7.5.

⁴⁶ Revised tariff sections 11.31 – 11.31.3, and 30.5.1; tariff appendix A, new definitions of “Under/Over Delivery Charge,” “Under/Over Delivery Price,” and “Under/Over Delivery Quantity;” tariff appendix A, deleted definitions of “Decline Monthly Charge – Exports,” “Decline Monthly Charge – Imports,” “Decline Potential Charge – Exports,” “Decline Potential Charge – Imports,” “Decline Threshold Percentage – Imports/Exports,” and “Deleted Threshold Quantity – Imports/Exports.”

transaction if the intertie resource supporting that transaction has a positive under/over delivery quantity. The under/over delivery charge will equal the intertie resource’s under/over delivery quantity (subject to certain exclusions) multiplied by the under/over delivery price for the resource’s corresponding intertie in that FMM interval.⁴⁷ Importantly, the existing 10 percent monthly threshold will no longer apply. The CAISO will then allocate the under/over delivery charge amounts among scheduling coordinators.⁴⁸ Figure 3, below, summarizes the key points of the new under/over delivery charge and how they compare to the existing decline potential charge. The CAISO discusses these points in further detail in subsections III.B.1 through III.B.5, below.⁴⁹

Figure 3

	<i>Decline Potential Charge</i>	<i>Under/Over Delivery Charge</i>
<i>Time Granularity of Charge</i>	Monthly	Fifteen minutes
<i>Covered Resources/Schedules</i>	HASP block intertie schedules; economic hourly block bid with intra-hour option; external variable energy resource using own forecast	All intertie transactions not specifically exempted
<i>Exempt Resources/Schedules</i>	Fifteen-minute dispatchable economic bids; external variable energy resource using CAISO forecast; dynamic transfers	Schedule curtailed for reliability reason; existing transmission contract or transmission ownership right self-schedule; dynamic transfers
<i>Covered Non-Deliveries</i>	Under-deliveries only	Under- and over-deliveries
<i>Applicable Charge</i>	Greater of (i) 50 percent of FMM LMP; or (ii) \$10/MWh	Greater of: (i) 50 percent of the FMM LMP; (ii) 50 percent of the highest RTD LMP among three RTD intervals in FMM; or (iii) \$10.00 MWh. Parts (i) & (ii) are 75 percent if undelivered schedule accepted in ADS.
<i>Quantity Subject to Charge</i>	Undelivered import/export schedules if declined before start of FMM interval but only if quantity exceeds: (i) 10 percent of total scheduling coordinator’s monthly imports/exports; and (ii) 300 MWh	All undelivered import/export schedules.
<i>Allocation of Funds Collected</i>	Pro-rata by measured demand in month	Pro-rata by measured demand on day charges assessed

1. Calculation for Each FMM Interval

The CAISO will calculate the under/over delivery charge for each FMM interval. This will ensure that the charges a scheduling coordinator incurs are in proportion to the impact its under- or over-deliveries have on the CAISO market across the actual intervals in which they occur, thus incentivizing scheduling coordinators to deliver on their awarded intertie transactions.

On the other hand, the monthly non-delivery charge under the existing tariff allows a scheduling coordinator not to deliver an intertie transaction during stressed system conditions with accompanying high prices but without incurring a non-delivery charge, so long as it does not exceed the existing ten percent threshold over the entire month. The CAISO’s proposed methodology for calculating the under/over delivery charge for each FMM interval eliminates that issue.

⁴⁷ Revised tariff sections 11.31 – 11.31.2.

⁴⁸ Revised tariff section 11.31.3.

⁴⁹ The CAISO’s Draft Final Proposal, included as Attachment C, provides detailed examples of how the proposed deviation charge interacts with the proposed changes to how the E-Tagging rules interface with market timelines. Attachment C, at 44-48.

2. Under/Over Delivery Quantity

For an hourly block schedule, the under/over delivery quantity will equal the absolute value of the difference between: (1) the HASP block intertie schedule; and (2) the final quantity of the energy profile on the intertie transaction's E-Tag.⁵⁰ This calculation captures the energy under hourly block schedules that is under-delivered or over-delivered.

The CAISO also proposes to determine an under/over delivery quantity (and thus an under/over delivery charge) for fifteen-minute dispatchable resources. This proposal is reasonable because undelivered fifteen-minute dispatchable intertie bids tie up transmission capacity reserved in the HASP, just as undelivered hourly block intertie bids do. For a fifteen-minute dispatchable resource, the under/over delivery quantity will equal the amount by which the HASP advisory schedule exceeds the quantity of the transmission profile of the E-Tag as of T-40.⁵¹ This calculation captures the energy that cannot be delivered for fifteen-minute dispatchable resources and accords with the T-40 timeline for submitting E-Tag transmission profiles discussed above.⁵² Specifically, this logic works in conjunction with the CAISO's existing functionality of automatically updated fifteen-minute dispatchable E-Tags. When the HASP schedule is submitted, the scheduling coordinator must submit an E-Tag by T-40 with a transmission profile. The FMM energy award is published roughly 22.5 minutes prior to the applicable interval. The NAESB tagging deadline is 20 minutes prior to the interval, so there is a very short window in which the E-Tag energy profile can be updated to match the award. To remedy this, the ISO automated the adjustment process and will update E-Tag energy profiles to match the award as soon as the award is published. This process can only occur if the E-Tag has a transmission profile to support the schedule. As a result, as long as the transmission profile is submitted, the energy profile will be adjusted to match the award. If the transmission profile is not submitted, the resource is deemed unavailable.

⁵⁰ New tariff section 11.31.1.1. Similarly, in the case of an exceptional dispatch or other manual dispatch instruction, the under/over delivery quantity will be the absolute value of the difference between (1) the exceptional dispatch or manual dispatch instruction quantity and (2) the final quantity of the energy profile on the intertie transaction's E-Tag. *Id.*

⁵¹ New tariff section 11.31.1.2. If, instead, that transmission profile equals or exceeds the HASP advisory schedule, then there will be no under/over delivery quantity (and therefore no under/over delivery charge) for that intertie transaction for that FMM interval. *Id.* Further, in the case of an exceptional dispatch or other manual dispatch instruction, the under/over delivery quantity will be calculated in the same way described in the footnote immediately above. *Id.*

⁵² See *supra* section III.A.1 of this transmittal letter.

For both hourly block schedules and fifteen-minute dispatchable resources, the under/over delivery quantity will be slightly different where the intertie schedule has been exceptionally dispatched or otherwise is subject to a manual dispatch. In these cases, the under/over delivery quantity will be determined based on the absolute value of the difference between the: (1) Exceptional Dispatch or manual Dispatch Instruction quantity; and (2) final quantity of the Energy profile on the Intertie transaction's E-Tag.⁵³ The rationale for this different treatment is that the exceptional dispatch overrides the prior market award and that treatment should be reflected in calculating the over/under delivery quantity.

The calculation of the under/over delivery quantity will exclude certain energy deliveries or non-deliveries in three circumstances. First, the calculation will exclude energy not delivered because a balancing authority or transmission service provider curtailed delivery for reliability reasons.⁵⁴ This exclusion will prevent a scheduling coordinator from being subject to an under/over delivery charge due to compliance with a reliability directive outside of its control.⁵⁵ Second, the calculation will exclude energy either delivered or not delivered as part of a valid existing transmission contract (ETC) self-schedule or transmission ownership right (TOR) self-schedule.⁵⁶ This exclusion recognizes that ETC and TOR self-schedules represent preexisting scheduling rights reserved for the scheduling coordinator.⁵⁷ Third, the calculation will exclude energy either delivered or not delivered from a dynamic system resource.⁵⁸ Dynamic resources are scheduled on a five-minute basis, rather than a fifteen-minute basis, so dynamic resources do not create the same sort of issues that other intertie deviations can create. This exclusion also maintains the exclusion from intertie schedule decline charges that the existing tariff provides for dynamically scheduled transfers.⁵⁹

⁵³ See new tariff section 11.31.1.1 and 11.31.1.2.

⁵⁴ New tariff section 11.31.1.3(a).

⁵⁵ In such cases, the scheduling coordinator must reflect the reliability-based curtailment on the transaction's final E-Tag. *Id.*

⁵⁶ New tariff section 11.31.1.3(b).

⁵⁷ See existing tariff sections 16-17.

⁵⁸ New tariff section 11.31.1.3(c). Pseudo-tie generating units also will be excluded from the charge because they are treated as internal generating units. Per the definition of "Pseudo-Tie" in Appendix A of the CAISO tariff, a pseudo-tie is "deemed to be produced in an Attaining Balancing Authority Area that provides Balancing Authority services . . ." In the case of a pseudo-tie import, the CAISO is the attaining balancing authority area. For this reason, the tariff does not specifically exempt them even though the charge will not apply.

⁵⁹ See existing tariff section 11.31.

3. Under/Over Delivery Price

Except as described below, the under/over delivery price will equal the greater of: (a) 50 percent of the LMP in the corresponding FMM interval at the intertie where the resource was scheduled; (b) 50 percent of the highest LMP among the three five-minute RTD intervals corresponding to the FMM interval at the intertie where the resource was scheduled; or (c) \$10.00.⁶⁰ Values (a) and (c) are reflect the existing tariff provision, which states that, for each settlement interval during the month, the CAISO calculates the decline potential charge by multiplying the MWh of undelivered import or export energy by the greater of 50 percent of the LMP for the FMM or \$10/MWh.⁶¹ The CAISO proposes to add new value (b) to the equation to strengthen the incentive for scheduling coordinators to deliver their scheduled amounts. Intertie deviations generally affect the real-time market, which includes both the FMM and the RTD. The CAISO cannot predict exactly how an intertie deviation specifically might impact FMM or RTD prices. Basing the under/over delivery charge on the higher of the FMM or RTD price better ensures that the charge considers the effects on all markets disrupted by the conduct the charge is meant to dissuade.

The CAISO proposes to calculate an under/over delivery price higher than the one described above if the automated dispatch system recognizes a scheduling coordinator as having accepted an award at an intertie (because the scheduling coordinator actively accepts the award or because the scheduling coordinator fails to decline it) and the awarded energy is not delivered. In that circumstance, the under/over delivery price will equal the greater of the three values listed above except that the 50 percent values under (a) and (b) will instead be 75 percent values.⁶² A higher charge is warranted in these circumstances because, if a scheduling coordinator does not decline an awarded intertie schedule, and simply fails to deliver, the CAISO has no advance notification that the energy will not be delivered. On the other hand, if the CAISO receives advance notification of a non-delivery, the CAISO balancing authority area operator has adequate time to dispatch additional energy, outside of the market run, if necessary. This higher charge for accepted, but not delivered, awards will incent scheduling coordinators to timely give CAISO system operators the information they need to take actions to better ensure reliability, such as manually dispatching a resource to provide the energy not delivered by a scheduling coordinator under its scheduled intertie transaction.

⁶⁰ Revised tariff section 11.31.2.

⁶¹ See existing tariff section 11.31(d). Maintaining the existing \$10.00 minimum charge will also ensure that scheduling coordinators are subject to an under/over delivery charge even when pricing in the market is low or negative.

⁶² Revised tariff section 11.31.1.

4. Eliminate the 10 Percent and 300 MWh Thresholds in Applying the Under/Over Delivery Charge

The CAISO proposes to eliminate the tariff provisions stating that the decline monthly charges only apply if the scheduling coordinator's undelivered amount of imports or exports for the month equals or exceeds both (i) 10 percent of the total scheduling coordinator's monthly imports or exports and (ii) 300 MWh.⁶³ Neither threshold will apply to the under/over delivery charge.

As the Commission recognized in the 2008 Order, the CAISO established the thresholds solely because it was unable to determine whether an intertie transaction was not delivered because: (1) an operator for another balancing authority area had curtailed transmission or taken some other similar action outside of the scheduling coordinator's control; or (2) the scheduling coordinator had chosen not to deliver the full energy.⁶⁴ Today, however, the CAISO receives curtailment information from other balancing authority areas and thus can distinguish between these two possibilities. Thus, the thresholds no longer need to be included in the tariff.⁶⁵

Eliminating the thresholds also follows the direction in the 2008 Order that the Commission "expect[s] CAISO will continue to monitor the level of pre-dispatched bid declines. If the situation does not improve, we will remain open to further remedies."⁶⁶ As discussed above, the problem still abounds. The CAISO has determined that eliminating these thresholds and making the other revisions in this tariff amendment is an appropriate and necessary remedy to address the continuing problem of pre-dispatched bid declines. The data provided above supports this conclusion and shows that the current charge structure, with the thresholds, does not sufficiently deter intertie non-deliveries.

⁶³ Existing tariff sections 11.31.1 – 11.31.2; tariff appendix A, existing definitions of "Decline Monthly Charge – Imports," "Decline Monthly Charge – Exports," "Decline Threshold Percentage – Imports/Exports," and "Decline Threshold Quantity – Imports/Exports."

⁶⁴ See 2008 Order at P 27 ("CAISO's proposed 10 percent threshold will appropriately accommodate bid declines that are beyond the scheduling coordinator's control, such as curtailments by reliability authorities, derates of transmission lines or generation outages"); *id.* at P 29 ("We will also not require CAISO to evaluate declines to determine whether they are justified as beyond the scheduling coordinator's control. CAISO indicates that it does not have sufficient visibility to tally the entire universe of circumstances which are beyond a market participant's control . . . We agree and find that such a requirement would be unreasonable").

⁶⁵ As discussed above, the CAISO will exclude from the under/over delivery quantity any energy that is not delivered because a balancing authority or EIM transmission service provider curtailed the delivery for reliability reasons, so long as the reliability-based curtailment is reflected on the transaction's final E-Tag. New tariff section 11.31.1.3(a).

⁶⁶ 2008 Order at P 30.

5. Allocate the Under/Over Delivery Charge

The CAISO proposes to allocate the under/over delivery charge similar to how it allocates the decline monthly charge under the existing tariff, except that the CAISO will now allocate the charge daily rather than monthly. The CAISO will distribute the total charges collected for a day pro rata based on a scheduling coordinator's measured CAISO demand during that interval as a percent of total measured CAISO demand in that interval, excluding demand served by ETCs and TORs.⁶⁷ Again, this exclusion recognizes that ETC and TOR self-schedules represent preexisting scheduling rights reserved for the scheduling coordinator.

C. Clarify the Tariff Provisions that Address Intertie Scheduling Practices

The existing HASP settlement reversal rule in the tariff states that the CAISO will charge a scheduling coordinator the positive difference between the day-ahead market price and the FMM LMP applicable to any imports that clear the day-ahead market and are reduced through a bid to the real-time market, if the scheduling coordinator withdraws an E-Tag prior to 45 minutes before the trading hour.⁶⁸ However, the CAISO has identified a discrepancy between this tariff provision and the language in the BPM configuration guide, which states that the CAISO will charge the amount for such imports if the day-ahead schedule is reduced before publication of the HASP results (as opposed to 45 minutes before the trading hour).⁶⁹

To address the discrepancy, the CAISO proposes to revise the tariff provision to conform it to the language in the BPM configuration guide.⁷⁰ The purpose of the HASP settlement reversal rule is to address implicit virtual bidding.⁷¹ As long as day-ahead schedules are supported by an E-Tag until the CAISO publishes the results of the HASP, the resource can be used in the HASP market optimization without being deemed to be an implicit virtual bidder. The CAISO's proposed tariff revision has this result.

⁶⁷ Revised tariff section 11.31.3.

⁶⁸ Existing tariff section 11.32(i).

⁶⁹ BPM configuration guide 6460, version 5.8, at 5-6. This document is available at <https://bpmcm.caiso.com/Pages/SnBBPMDetails.aspx?BPM=Settlements%20and%20Billing>.

⁷⁰ Revised tariff section 11.32(i).

⁷¹ See *Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,204, at P 56.

IV. Responses to Stakeholder Comments

Most stakeholders supported the proposals reflected in this tariff amendment. They believe the proposed non-delivery charge is justified and will incent delivery of scheduled intertie energy, which will increase grid reliability. Additional benefits identified by stakeholders include more accurate market inputs to the CAISO real-time market and reduced speculative bidding, *i.e.*, bidding without a firm source (or export sink) lined up, or selling bid-in energy elsewhere after an intertie transaction bid is submitted to the CAISO. However, some stakeholders objected to aspects of the proposed changes. The CAISO addresses those objections below.

A. Comments on the Enhancements to the Treatment of Intertie Schedules and the E-Tag Rules

One stakeholder argued that the tariff revisions to allow the CAISO to base FMM schedules on preliminary E-Tags with transmission profiles submitted before the FMM runs will cause more work for scheduling coordinators by requiring submission of the E-Tag transmission profiles by T-40. In response, the CAISO explained that the objective of the tariff revisions is to ensure more accurate market inputs. At an early point in the stakeholder process, the CAISO had proposed a more stringent timeline for scheduling coordinators that would have required submission of both the E-Tag transmission profile and the E-Tag energy profile by T-40. However, based on stakeholder feedback, the CAISO amended that more stringent proposal to what it now proposes in this tariff amendment. The CAISO's proposal provides scheduling coordinators with the flexibility to adjust the energy profile portion of their E-Tags until T-20. The CAISO agreed that it is important to improve market inputs, while also providing flexibility to scheduling coordinators. The proposal reflected in this tariff amendment meets both of those objectives.

The same stakeholder also asserted that the CAISO should continue to seek continuity between the CAISO market timelines and the timelines established by NAESB. The CAISO responded by explaining that the FMM primarily exists to provide flexibility closer to real-time and to integrate renewable resources into the CAISO balancing authority area.⁷² The CAISO acknowledges that the Western Interconnection continues to schedule bilateral transactions primarily on an hourly basis. The CAISO has sought to minimize adverse impacts on the bilateral market in developing this tariff amendment. However, the CAISO must balance that consideration with the need for reliability and a highly efficient real-time market that can meet the purposes of the FMM described above. Aligning the policy reflected in the tariff amendment with the hourly bilateral market would be a step away from achieving those objectives.

⁷² See *Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,204, at PP 8, 53.

B. Comments on Calculating the Under/Over Delivery Charge for Each FMM Interval

One stakeholder argued that it is unduly discriminatory to impose a fifteen-minute evaluation interval in calculating the under/over delivery charge for hourly block resources. In response, the CAISO explained that hourly block resources have been subject to fifteen-minute settlement since implementation of the Order No. 764 tariff enhancements the Commission accepted in 2014.⁷³ Order No. 764 requires balancing authority areas to offer fifteen-minute scheduling to facilitate the integration of renewable resources.⁷⁴ This tariff amendment maintains compliance with Order No. 764 and ensures that settlement of the under/over delivery charge aligns with the interval in which the deviation from the scheduled intertie transaction occurred.

Another stakeholder argued that the CAISO has not correlated intertie declines with emergency grid situations. The CAISO disagrees. During the stakeholder process, and as discussed above, the CAISO explained that intertie declines can cause emergency grid situations. For example, as discussed above, an emergency event occurred in the CAISO on May 3, 2017 and during a heat wave on September 1-2, 2017. Undelivered imports affected grid stability on these days. This stakeholder also ignores the problems under-deliveries can cause during non-emergency periods, such as raising real-time prices and increasing the need for manual market interventions.

This stakeholder also argued that implementing the under/over delivery charge will reduce market participants' incentives to submit real-time intertie bids. The CAISO has designed the under/over delivery charge so it is stringent enough to encourage delivery of scheduled energy, without being too onerous. The existing mechanism has been ineffective, and a more robust mechanism is needed. Scheduling coordinators still can sell energy economically to the CAISO and will not be negatively affected when the energy is delivered as scheduled. Nevertheless, the CAISO will monitor the impact and effectiveness of the new under/over delivery charge and will consider appropriate incremental enhancements if necessary.

C. Other Comments on the Under/Over Delivery Charge

One stakeholder argued that imports are "surplus energy" and are not needed for reliability because the CAISO has resource adequacy (RA) requirements. The stakeholder claimed that intertie resources should not be

⁷³ See generally *id.*

⁷⁴ See *id.* at P 6.

charged for deviations from their schedules. The CAISO responded that intertie transactions economically clearing the CAISO market are needed for reliability. RA requirements merely require RA resources to submit bids,⁷⁵ but such bids do not necessarily clear the market. In the market optimization, an intertie bid from non-RA capacity may be more economic than bids from RA capacity. If that non-RA resource fails to deliver then it is too late to utilize an RA import.

Another stakeholder contended that the under/over delivery charge should not apply if the scheduling coordinator notifies the CAISO of undeliverable intertie energy before the FMM. The CAISO explained that the under/over delivery charge must apply in that circumstance because, although advance notification of the non-delivery is useful to the CAISO grid operator, it is still impossible for the HASP to schedule another hourly block resource to compensate for the non-delivery. Therefore, it is important for scheduling coordinators to deliver hourly block resources as scheduled through the HASP. This tariff amendment provides an enhanced economic incentive to meet that objective.

A third stakeholder argued that intertie transactions should be treated the same as internal generation, which is only subject to imbalance energy settlement at the five-minute RTD for deviations from fifteen-minute schedules. The two are not similarly situated. In the stakeholder process, the CAISO responded that maintaining comparable pricing signals for internal and external supply is important but noted there are fundamental differences in how these supply resources are scheduled and dispatched in the CAISO market. Internal supply resources are generator-specific, are subject to bid verification, are dispatched every five-minute interval, and are always subject to imbalance energy charges.⁷⁶ On the other hand, the majority of intertie resources are non-resource-specific, are not subject to bid verification, and are scheduled for hourly blocks approximately 60 minutes ahead of time. When an hourly block schedule is scheduled, transmission capacity is reserved for that specific transfer. If the transfer is subsequently not completed, it is impossible to schedule another in-kind replacement resource, and the transmission capacity goes unused. That differentiates imports from internal generation and yields inefficient market results. For these reasons, it is appropriate to use the under/over delivery charge as an economic incentive for the delivery of intertie energy, and to base that charge on the greater of the LMP in the corresponding FMM interval and the highest LMP among the three five-minute RTD intervals corresponding to the FMM interval.

⁷⁵ See generally existing tariff section 40 *et seq.*

⁷⁶ See existing tariff section 11.5 *et seq.*

D. Comments on the Need for Data Analysis and Process Improvements

The MSC supports the framework of the intertie deviation settlement proposal but wishes the CAISO would also address market inputs that affect real-time market intertie prices at the same time it implements the proposed tariff revisions. The MSC notes that in stressed system conditions and high amounts of undelivered imports, the real-time market had high HASP prices with much lower FMM and five-minute RTD prices. The MSC states this may incentivize scheduling coordinators not to deliver imports because the prices used for financial settlement could be lower than the submitted import bid. According to the MSC, these pricing anomalies may be caused by CAISO grid operator load forecast adjustments and intertie exceptional dispatches in anticipation of undelivered imports. The MSC supports further analysis of this relationship and implementing additional measures to permit the FMM and RTD prices better reflect stressed system conditions.

Although the MSC's request pertained to additional enhancements that are beyond the scope of the proposed tariff revisions, the CAISO undertook data analysis to better understand the impacts of load conformance adjustments and exceptional dispatches on both real-time pricing and intertie declines. The CAISO published this data analysis for stakeholder review in 2019.⁷⁷ Part of the report explored how intertie deviations negatively impact price formation across CAISO markets. The results of the data analysis will lead to process improvements that can be implemented in Fall 2021 with the planned implementation of the Day-Ahead Market Enhancements initiative.⁷⁸ In any event, the proposed tariff revisions are just and reasonable, and necessary to address ongoing problems and challenges, without the additional enhancements that cannot be implemented for more than a year. Implementing tariff revisions will better assure delivery of intertie resources, which will reduce or eliminate the need for out-of-market processes that may be negatively affecting real-time pricing.

V. Effective Date, Request for Waiver, and Request for Timely Commission Order

The CAISO expects to implement the changes proposed in this tariff amendment effective October 1, 2020 as part of its planned software release for the Fall of 2020. Therefore, the CAISO respectfully requests that the

⁷⁷ The analysis is available on the CAISO website at: <http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=C83A8C49-5DFF-48B2-97A8-5C851AC3FDD0>.

⁷⁸ Information about the Day-Ahead Market Enhancements initiative is available at <http://www.caiso.com/StakeholderProcesses/Day-ahead-market-enhancements>.

Commission grant a waiver of its notice requirement to permit this effective date, which is over 120 days after the CAISO is submitting this tariff amendment.⁷⁹ Consistent with this timing, the CAISO also respectfully requests that the Commission issue an order by September 17, 2020, accepting the tariff revisions in this filing effective October 1, 2020.

Good cause exists for the Commission to grant these requests. Commission issuance of an order by September 17 will give the CAISO and market participants regulatory certainty and the necessary time to implement the tariff revisions on October 1. Therefore, granting the CAISO's requests is appropriate.

VI. Communications

Under Rule 203(b)(3) of the Commission's Rules of Practice and Procedure,⁸⁰ the CAISO requests that all correspondence, pleadings, and other communications about this filing be served upon:

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VII. Service

The CAISO has served copies of this filing on the California Public Utilities Commission, the California Energy Commission, and all parties with Scheduling Coordinator Agreements under the CAISO tariff. In addition, the CAISO has posted a copy of the filing on the CAISO website.

⁷⁹ Specifically, pursuant to section 35.11 of the Commission's regulations, 18 C.F.R. § 35.11, the CAISO requests waiver of the 120-day notice requirement contained in section 35.3(a)(1) of the regulations, 18 C.F.R. § 35.3(a)(1).

⁸⁰ 18 C.F.R. § 385.203(b)(3).

VIII. Contents of Filing

Besides this transmittal letter, this filing includes these attachments:

- Attachment A Clean CAISO tariff sheets incorporating this tariff amendment
- Attachment B Red-lined document showing the revisions in this tariff amendment
- Attachment C Draft Final Proposal
- Attachment D Board Memorandum

IX. Conclusion

The CAISO respectfully requests that the Commission issue an order by September 17, 2020 that accepts the tariff changes proposed in this filing for implementation by October 1, 2020.

Respectfully submitted,

/s/ David Zlotlow

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Attachment A – Clean Tariff

Intertie Deviation Settlement

California Independent System Operator Corporation

May 22, 2020

11.31 Under/Over Delivery Charge for Deviations from Intertie Awards

For each FMM interval, the CAISO assesses an Under/Over Delivery Charge to a Scheduling Coordinator with an Intertie transaction if the Intertie resource supporting that transaction has a positive Under/Over Delivery Quantity. The Under/Over Delivery Charge is the product of the Intertie resource's Under/Over Delivery Quantity in that FMM interval and the Under/Over Delivery Price for the resource's corresponding intertie in that FMM interval.

11.31.1 Determining the Under/Over Delivery Quantity

11.31.1.1 Under/Over Delivery Quantity for Hourly Block Schedules

For Self-Schedule Hourly Blocks for Energy and Ancillary Services and Economic Hourly Block Bids for Energy and Ancillary Services, and Economic Hourly Block Bids with Intra-Hour Option for Energy, the Under/Over Delivery Quantity is the absolute value of the difference between the: (1) HASP Block Intertie Schedule or HASP Advisory Schedule, as appropriate; and (2) final quantity of the Energy profile on the Intertie transaction's E-Tag. In the case of an Exceptional Dispatch or other manual Dispatch Instruction, the Under/Over Delivery Quantity is the absolute value of the difference between the: (1) Exceptional Dispatch or manual Dispatch Instruction quantity; and (2) final quantity of the Energy profile on the Intertie transaction's E-Tag.

11.31.1.2 Under/Over Delivery Quantity for Fifteen-Minute Dispatchable Resources

For Intertie transactions not addressed in Section 11.31.1.1, the Under/Over Delivery Quantity is the amount by which the HASP Advisory Schedule exceeds the quantity of the transmission profile of the E-Tag as of forty minutes prior to the Operating Hour. If the transmission profile of the E-Tag as of forty minutes prior to the Operating Hour is greater than or equal to the HASP Advisory Schedule, then there is no Under/Over Delivery Quantity for that Intertie transaction for that FMM interval.

In the case of an Exceptional Dispatch or other manual Dispatch Instruction, the Under/Over Delivery Quantity is the absolute value of the difference between the: (1) Exceptional Dispatch or manual Dispatch Instruction quantity; and (2) final quantity of the Energy profile on the Intertie transaction's E-Tag.

11.31.1.3 Exclusions from the Under/Over Delivery Quantity

The CAISO excludes from the Under/Over Delivery Quantity as calculated under either 11.31.1.1 or 11.31.1.2 any Energy that meets at least one of the following conditions:

- (a) Energy that is not delivered because a Balancing Authority or EIM Transmission Service Provider curtailed the delivery for reliability reasons. The reliability-based curtailment must be reflected on the transaction's final E-Tag.
- (b) Energy that is either delivered or not delivered as part of a valid ETC Self-Schedule or TOR Self-Schedule.
- (c) Energy that is either delivered or not delivered from a Dynamic System Resource.

11.31.2 Determining the Under/Over Delivery Price

If ADS recognizes a Scheduling Coordinator as accepting an award at an Intertie (either because the Scheduling Coordinator actively accepts the award or because the Scheduling Coordinator fails to decline it) and the awarded Energy is not delivered, then the Under/Over Delivery Price is the greater of: (a) 75% of the LMP in the corresponding FMM interval at the intertie where the resource was scheduled; (b) 75% of the highest LMP among the three RTD intervals corresponding to the FMM interval at the intertie where the resource was scheduled; or (c) \$10.00.

In all other cases, the Under/Over Delivery Price is the greater of: (a) 50% of the LMP in the corresponding FMM interval at the Intertie where the resource was scheduled; (b) 50% of the highest LMP among the three RTD intervals corresponding to the FMM interval at the Intertie where the resource was scheduled; or (c) \$10.00.

11.31.3 Allocation of Under/Over Delivery Charges

For any Trading Day on which the CAISO assesses an Under/Over Delivery Charge, each Scheduling Coordinator receives a credit on its Settlement Statement for its share of the total Under/Over Delivery Charges collected for that day. The CAISO distributes the total charges collected pro rata based on a Scheduling Coordinator's Measured CAISO Demand on that day as a percent of total Measured CAISO Demand for the CAISO Balancing Authority Area on that day. Both the numerator and denominator of the pro rata calculation exclude demand served by ETCs and TORs.

11.32 Measures to Address Intertie Scheduling Practices

The CAISO will take the following actions regarding Schedules that clear the Day-Ahead Market at the Interties and that are wholly or partially reversed through a FMM Schedule:

- (i) The CAISO will charge the Scheduling Coordinator the positive difference between the

Day-Ahead Market price and the FMM LMP applicable to any imports that clear the Day-Ahead Market and are reduced through a Bid to the RTM if the Scheduling Coordinator either: (a) fails to submit an E-Tag or E-Tags consistent with the Scheduling Coordinator's Day-Ahead Schedule and WECC scheduling criteria; or (b) withdraws the E-Tag or E-Tags prior to the CAISO's publication of HASP results on the CAISO's secure communication system.

- (ii) The CAISO will charge the Scheduling Coordinator the positive difference between the FMM LMP and the Day-Ahead Market LMP applicable to any exports that clear the Day-Ahead Market and are reduced through a Bid to the RTM if the Scheduling Coordinator either: (a) fails to submit an E-Tag or E-Tags consistent with the Scheduling Coordinator's Day-Ahead Schedule and WECC scheduling criteria; or (b) withdraws the E-Tag or E-Tags prior to forty-five (45) minutes before the Trading Hour.
- (iii) If a Scheduling Coordinator reduces a Day-Ahead import or export Schedule through a Bid to the RTM and submits Schedules on behalf of, or is, a CRR Holder, then the reduction to the import or export may be treated as a Virtual Award for purposes of adjusting CRR Revenue as further set forth in Section 11.2.4.6.
- (iv) For any import Schedule that clears the Day-Ahead Market which a Scheduling Coordinator reduces through a Bid to the RTM, such reduced quantities will be subject to the allocation of Net RTM Bid Cost Uplift as set forth in Section 11.8.6.6.
- (v) The provisions of this Section 11.32 will not apply to Schedules that clear the Day-Ahead Market at the Scheduling Points and that a Scheduling Coordinator wholly or partially reverses through a Bid to the RTM to the extent such Schedules are valid and balanced ETC, TOR, or Converted Rights Self-Schedules in the Day-Ahead Market.

* * *

30.5.1 General Bidding Rules

* * *

- (r) A Scheduling Coordinator may submit a Variable Energy Resource Self-Schedule for the RTM can be submitted from a Variable Energy Resource. A Scheduling Coordinator can use either the CAISO forecast for Expected Energy in the RTM or can provide its own forecast for Expected Energy pursuant to the requirements specified in Section 4.8.2. The Scheduling Coordinator must indicate in the Master File whether it is using its own forecast or the CAISO forecast for its resource in support of the Variable Energy Self-Schedule. The Scheduling Coordinator is not required to include the same MWh quantity for each of the four fifteen (15)-minute intervals that make up the applicable Trading Hour for the Variable Energy Resource Self-Schedule include. If an external Variable Energy Resource that is not using a forecast of its output provided by the CAISO submits a Variable Energy Resource Self-Schedule and the Expected Energy is not delivered in the FMM, the Scheduling Coordinator for the Variable Energy Resource will be subject to the Under/Over Delivery Charge as described in Section 11.31. Scheduling Coordinators for Dynamically Scheduled Variable Energy Resources that provide the CAISO with a two-hour rolling forecast with five-minute granularity can submit Variable Energy Resource Self-Schedules.

* * *

30.5.7 E-Tag Rules and Treatment of Inertie Schedules

In addition to complying with all generally applicable E-Tagging requirements, Scheduling Coordinators must submit their E-Tags consistent with the requirements specified in this Section 30.5.7. If a Scheduling Coordinator receives an intra-hour Schedule change, then the Scheduling Coordinator must, by twenty minutes before the start of the FMM interval to which the Schedule change applies, ensure that an updated energy profile reflects the change. Absent extenuating circumstances, the CAISO

automatically updates Energy profiles on E-Tags for Energy Schedules that change from HASP to the FMM within a Trading Hour. In performing this service for a Scheduling Coordinator, the CAISO does not assume any responsibility for compliance with any E-Tag requirements or obligations to which the Scheduling Coordinator is subject. The changed energy profile will apply for the balance of the operating hour unless it is subsequently changed by a further updated energy profile.

30.5.7.1 Self-Schedule Hourly Blocks

By forty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag (or set of E-Tags) that passes CAISO E-Tag validation procedures and that supports the Self-Schedule Hourly Block.

The transmission profile of the E-Tag at forty minutes prior to the applicable Trading Hour must be equal to the Self-Schedule Hourly Block. If the Scheduling Coordinator has a transmission profile less than its advisory Energy schedule, then the CAISO will limit the schedule for Energy in the FMM so that it does not exceed the quantity of the transmission profile.

The Scheduling Coordinator may revise the Energy profile up to twenty minutes prior to the applicable Trading Hour but the quantity of the Energy profile must be equal to the quantity of the Self-Schedule Hourly Block by twenty minutes prior to the applicable Trading Hour. The CAISO may modify the Energy profile due to Reliability related curtailments.

If the Scheduling Coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM Schedule associated with the Self-Schedule Hourly Block to zero for each FMM interval of the hour.

30.5.7.2 Variable Energy Resource Self-Schedule

By forty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag (or set of E-Tags) that passes CAISO E-Tag validation procedures and that supports the Variable Energy Resource Self-Schedule.

The transmission profile of the E-Tag at forty minutes prior to the applicable Trading Hour must be equal to the Variable Energy Resource Self-Schedule. If the Scheduling Coordinator has a transmission profile less than its advisory Energy schedule, then the CAISO will limit the schedule for Energy in the FMM so that it does not exceed the quantity of the transmission profile.

The Scheduling Coordinator may revise the Energy profile up to twenty minutes prior to the applicable Trading Hour but the quantity of the Energy profile must be equal to the quantity of the Variable Energy Resource Self-Schedule by twenty minutes prior to the applicable Trading Hour. The CAISO may modify the Energy profile due to Reliability related curtailments.

If the Scheduling Coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM Schedule associated with the Variable Energy Resource Self-Schedule to zero for each FMM interval of the hour.

30.5.7.3 Economic Hourly Bid

By forty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag (or set of E-Tags) that passes CAISO E-Tag validation procedures and that supports the Economic Hourly Block Bid.

The transmission profile of the E-Tag at forty minutes prior to the applicable Trading Hour must be equal to the Economic Hourly Block Bid. If the Scheduling Coordinator has a transmission profile less than its advisory Energy schedule, then the CAISO will limit the schedule for Energy in the FMM so that it does not exceed the quantity of the transmission profile.

The Scheduling Coordinator may revise the Energy profile up to twenty minutes prior to the applicable Trading Hour but the quantity of the Energy profile must be equal to the quantity of the Economic Hourly Block Bid by twenty minutes prior to the applicable Trading Hour. The CAISO may modify the Energy profile due to Reliability related curtailments.

If the Scheduling Coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM Schedule associated with the Economic Hourly Block Bid to zero for each FMM interval of the hour.

30.5.7.4 Economic Hourly Block Bid with Intra-Hour Option

By forty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag (or set of E-Tags) that passes CAISO E-Tag validation procedures and that supports the Economic Hourly Block Bid with Intra-Hour Option. The transmission profile of the E-Tag at forty minutes prior to the applicable Trading Hour must be equal to the Economic Hourly Block Bid with Intra-Hour Option. If the Scheduling Coordinator has a transmission profile less than its advisory Energy schedule, then the

CAISO will limit the schedule for Energy in the FMM so that it does not exceed the quantity of the transmission profile.

The Scheduling Coordinator may revise the Energy profile up to twenty minutes prior to the applicable Trading Hour but the quantity of the Energy profile must be equal to the quantity of the Economic Hourly Block Bid with Intra-Hour Option by twenty minutes prior to the applicable Trading Hour. The CAISO may modify the Energy profile due to Reliability related curtailments.

If the Scheduling Coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM Schedule associated with the Economic Hourly Block Bid with Intra-Hour Option to zero for each FMM interval of the hour.

In the case of an intra-hour redispatch from the FMM, the CAISO may increment or decrement the Energy profile to correspond to the intra-hour redispatch. The MW level to which the FMM can redispatch an Economic Hourly Block Bid with Intra-Hour Option above its HASP Advisory Schedule is limited by the quantity of the transmission profile submitted by forty minutes prior to the applicable Trading Hour.

30.5.7.5 FMM Economic Bid

By forty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag (or set of E-Tags) that passes CAISO E-Tag validation procedures and that supports the FMM Economic Bid.

The transmission profile of the E-Tag at forty minutes prior to the applicable Trading Hour must be greater than or equal to the FMM Economic Bid. If the Scheduling Coordinator has a transmission profile less than its advisory Energy schedule, then the CAISO will limit the schedule for Energy in the FMM so that it does not exceed the quantity of the transmission profile.

The Scheduling Coordinator may revise the Energy profile up to twenty minutes prior to the applicable Trading Hour but the quantity of the Energy profile must be equal to the quantity of the FMM energy schedule by twenty minutes prior to the applicable Trading Hour. The CAISO may modify the Energy profile due to Reliability related curtailments.

If the Scheduling Coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM Schedule associated with the FMM Economic Bid to zero for each FMM interval of the hour.

Scheduling Coordinators with cleared FMM Economic Bids may update either the transmission profile or the Energy profile after the relevant deadlines. A Scheduling Coordinator choosing to update the transmission profile must submit an updated transmission profile at least 40 minutes prior to the applicable FMM interval. A Scheduling Coordinator choosing to update the Energy profile must submit an updated Energy profile at least 20 minutes prior to the applicable FMM interval.

Cleared FMM Economic Bids are eligible for Bid Cost Recovery as specified in Section 11.8.

* * *

Appendix A

Master Definition Supplement

* * *

- Under/Over Delivery Charge

For a given Intertie transaction that has an Under/Over Delivery Quantity for a FMM interval, a charge equal to the product of the Under/Over Delivery Price and Under/Over Delivery Quantity.

- Under/Over Delivery Price

The price, as further specified in Section 11.31.2, a Scheduling Coordinator is charged for deviations between Energy awarded at an Intertie and Energy delivered at that Intertie.

- Under/Over Delivery Quantity

The quantity of Energy at an Intertie, as further specified in Section 11.31.1, the CAISO deems either under- or over-delivered relative to awarded Energy for purposes of charging a fee for such under- or over-deliveries.

Attachment B – Redline Tariff

Intertie Deviation Settlement

California Independent System Operator Corporation

May 22, 2020

11.31 Under/Over Delivery Charge for Deviations from Intertie Awards~~Intertie Schedules Decline Charges~~

~~For each FMM interval, the CAISO assesses an Under/Over Delivery Charge to a Scheduling Coordinator with an Intertie transaction if the Intertie resource supporting that transaction has a positive Under/Over Delivery Quantity. The Under/Over Delivery Charge is the product of the Intertie resource's Under/Over Delivery Quantity in that FMM interval and the Under/Over Delivery Price for the resource's corresponding intertie in that FMM interval.~~

~~The Decline Potential Charge shall apply to Intertie transactions as discussed below. The Decline Potential Charge does not apply to FMM Schedules of Economic Bids, dynamic transfers, and Variable Energy Resources located outside the CAISO Balancing Authority Area that have been qualified to use the forecast of their output produced by the CAISO as specified in Section 4.8.2.1.2.~~

- ~~(a) HASP Block Intertie Schedules: Any HASP Block Intertie Schedule for an Energy import when the HASP Block Intertie Schedule is not delivered for any reason (with no exceptions based on the circumstances of a particular failure to deliver), to the extent the decline is made prior to the start of the applicable FMM interval. The Decline Potential Charge — Exports shall apply to any HASP Block Intertie Schedule for an Energy export when the HASP Block Intertie Schedule is not delivered for any reason (with no exceptions based on the circumstances of a particular failure to deliver), to the extent the decline is made prior to the start of the applicable FMM interval. The Decline Potential Charge will not apply if the decline is made after the applicable E-tag deadline, as defined in Section 30.6.2.~~
- ~~(b) Economic Hourly Block Bid with Intra-Hour Option: Imports and exports accepted in an HASP Block Intertie Schedule that are incremental to Day-Ahead Schedules are subject to the Decline Potential Charge to the extent the decline is made prior to the start of the applicable FMM interval. The Decline Potential Charge will not apply if the decline is made after the applicable E-tag deadline, as defined in Section 30.6.2. To the extent the incremental import or export schedule in HASP is curtailed through the FMM, for the 15-minute FMM interval in which the resource follows the CAISO Dispatch Instructions will~~

~~not be subject to the Decline Potential Charge.~~

- ~~(c) Variable Energy Resources outside CAISO Balancing Authority Area Using Own Forecast: Imports from Variable Energy Resources using their own forecast are subject to the Decline Potential Charge to the extent the resource over forecasts over the month as discussed below. For each Trading Hour, the CAISO compares the maximum 15-minute FMM Schedule (that is based on the forecast submitted 37.5 minutes prior to flow) to the maximum 15-minute advisory schedule from the Hour Ahead Scheduling Process (based upon the hourly forecast received 75 minutes prior to flow) and calculates the differences between the two. These hourly differences are summed over the month. If the maximum advisory schedule exceeds the actual financially binding schedule by the relevant threshold over the course of the month, the Decline Potential Charge applies.~~
- ~~(d) Decline Potential Charge: For any Settlement Interval, the Decline Potential Charge—Imports or Decline Potential Charge—Exports, as the case may be, shall equal the MWh quantity of the import or export not delivered multiplied by the greater of \$10/MWh or fifty percent (50%) of the FMM LMP. The Decline Potential Charge—Imports and Decline Potential Charge—Exports will be calculated for each HASP Block Intertie Schedule or VER Self-Schedule that is not delivered, provided that only the Decline Monthly Charge—Imports and Decline Monthly Charge—Exports shall be payable by the Scheduling Coordinator as described in Section 11.31.1.~~

~~11.31.1_ Determining the Under/Over Delivery Quantity~~

~~Decline Monthly Charge—Imports~~

~~11.31.1.1 Under/Over Delivery Quantity for Hourly Block Schedules~~

~~For Self-Schedule Hourly Blocks for Energy and Ancillary Services and Economic Hourly Block Bids for Energy and Ancillary Services, and Economic Hourly Block Bids with Intra-Hour Option for Energy, the Under/Over Delivery Quantity is the absolute value of the difference between the: (1) HASP Block Intertie Schedule or HASP Advisory Schedule, as appropriate; and (2) final quantity of the Energy profile on the Intertie transaction's E-Tag. In the case of an Exceptional Dispatch or other manual Dispatch Instruction, the Under/Over Delivery Quantity is the absolute value of the difference between the: (1) Exceptional~~

Dispatch or manual Dispatch Instruction quantity; and (2) final quantity of the Energy profile on the Intertie transaction's E-Tag.

11.31.1.2 Under/Over Delivery Quantity for Fifteen-Minute Dispatchable Resources

For Intertie transactions not addressed in Section 11.31.1.1, the Under/Over Delivery Quantity is the amount by which the HASP Advisory Schedule exceeds the quantity of the transmission profile of the E-Tag as of forty minutes prior to the Operating Hour. If the transmission profile of the E-Tag as of forty minutes prior to the Operating Hour is greater than or equal to the HASP Advisory Schedule, then there is no Under/Over Delivery Quantity for that Intertie transaction for that FMM interval.

In the case of an Exceptional Dispatch or other manual Dispatch Instruction, the Under/Over Delivery Quantity is the absolute value of the difference between the: (1) Exceptional Dispatch or manual Dispatch Instruction quantity; and (2) final quantity of the Energy profile on the Intertie transaction's E-Tag.

11.31.1.3 Exclusions from the Under/Over Delivery Quantity

The CAISO excludes from the Under/Over Delivery Quantity as calculated under either 11.31.1.1 or 11.31.1.2 any Energy that meets at least one of the following conditions:

- (a) Energy that is not delivered because a Balancing Authority or EIM Transmission Service Provider curtailed the delivery for reliability reasons. The reliability-based curtailment must be reflected on the transaction's final E-Tag.
- (b) Energy that is either delivered or not delivered as part of a valid ETC Self-Schedule or TOR Self-Schedule.
- (c) Energy that is either delivered or not delivered from a Dynamic System Resource.

~~The Decline Monthly Charge — Imports shall be applied to each Scheduling Coordinator on the Settlement Statements issued for the last Trading Day of each Trading Month, and shall be the sum of the Scheduling Coordinator's Decline Potential Charges — Imports for each Settlement Period during that Trading Month multiplied by a ratio. The ratio will represent the portion of the Scheduling Coordinator's declined HASP Block Intertie Schedules for Energy imports or the VER Self-Schedules that exceed during the Trading Month the applicable exemption threshold described in Section 11.31.1 and Section 11.31.2.~~

- ~~(a) — The ratio will be calculated as follows:~~

~~(i) the Scheduling Coordinator's total MWh quantity of HASP Block Intertie Schedules for Energy imports that were not delivered during that Trading Month minus the applicable exemption threshold, divided by~~

~~(ii) the Scheduling Coordinator's total MWh quantity of HASP Block Intertie Schedules for Energy imports that were not delivered during the Trading Month.~~

~~(b) The applicable exemption threshold is the greater of the following:~~

~~(i) the Decline Threshold Quantity — Imports/Exports; or~~

~~(ii) the total MWh quantity of HASP Block Intertie Schedules for Energy imports during the Trading Month multiplied by the Scheduling Coordinator's Decline Threshold Percentage — Imports/Exports.~~

~~Notwithstanding the foregoing, the Decline Monthly Charge — Imports shall equal zero if either:~~

~~a) The percentage of the MWh quantity of HASP Block Intertie Schedules for Energy imports that the Scheduling Coordinator did not deliver during the Trading Month is less than the Decline Threshold Percentage — Imports/Exports; or~~

~~b) The total MWh quantity of HASP Block Intertie Schedules for Energy imports that the Scheduling Coordinator did not deliver in the applicable Trading Month is less than the Decline Threshold Quantity — Imports/Exports.~~

11.31.2 ~~Decline Monthly Charge — Exports~~Determining the Under/Over Delivery Price

If ADS recognizes a Scheduling Coordinator as accepting an award at an Intertie (either because the Scheduling Coordinator actively accepts the award or because the Scheduling Coordinator fails to decline it) and the awarded Energy is not delivered, then the Under/Over Delivery Price is the greater of: (a) 75% of the LMP in the corresponding FMM interval at the intertie where the resource was scheduled; (b) 75% of the highest LMP among the three RTD intervals corresponding to the FMM interval at the intertie where the resource was scheduled; or (c) \$10.00.

In all other cases, the Under/Over Delivery Price is the greater of: (a) 50% of the LMP in the corresponding FMM interval at the Intertie where the resource was scheduled; (b) 50% of the highest LMP among the three RTD intervals corresponding to the FMM interval at the Intertie where the resource

was scheduled; or (c) \$10.00.

~~The Decline Monthly Charge—Exports shall be applied to each Scheduling Coordinator on the Settlement Statements issued for the last Trading Day of each Trading Month, and shall be the sum of the Scheduling Coordinator's Decline Potential Charges—Exports for each Settlement Interval during that Trading Month multiplied by a ratio. The ratio will represent the portion of the Scheduling Coordinator's declined HASP Block Intertie Schedules for Energy exports that exceed the applicable exemption threshold during the Trading Month.~~

~~(a) — The ratio will be calculated as follows:~~

~~(i) — the Scheduling Coordinator's total MWh quantity of HASP Block Intertie Schedules for Energy exports that were not delivered during that Trading Month minus the applicable exemption threshold, divided by~~

~~(ii) — the Scheduling Coordinator's total MWh quantity of HASP Block Intertie Schedules for Energy exports that were not delivered during the Trading Month.~~

~~(b) — The applicable exemption threshold is greater of the following:~~

~~(i) — the Decline Threshold Quantity — Imports/Exports; or~~

~~(ii) — the total MWh quantity of HASP Block Intertie Schedules for Energy exports during the Trading Month multiplied by the Scheduling Coordinator's Decline Threshold Percentage — Imports/Exports.~~

~~Notwithstanding the foregoing, the Decline Monthly Charge — Exports shall equal zero if either:~~

~~a) — The percentage of the MWh quantity of HASP Block Intertie Schedules for Energy exports that the Scheduling Coordinator did not deliver during the Trading Month is less than the Decline Threshold Percentage — Imports/Exports; or~~

~~b) — The total MWh quantity of HASP Block Intertie Schedules for Energy exports that the Scheduling Coordinator did not deliver in the applicable Trading Month is less than the Decline Threshold Quantity — Imports/Exports.~~

11.31.3 Allocation of Import/Export Decline Monthly Under/Over Delivery Charges

For any Trading Day on which the CAISO assesses an Under/Over Delivery Charge, each Scheduling

Coordinator receives a credit on its Settlement Statement for its share of the total Under/Over Delivery Charges collected for that day. The CAISO distributes the total charges collected pro rata based on a Scheduling Coordinator's Measured CAISO Demand on that day as a percent of total Measured CAISO Demand for the CAISO Balancing Authority Area on that day. Both the numerator and denominator of the pro rata calculation exclude demand served by ETCs and TORs.

~~On the Settlement Statements issued for the last Trading Day of the applicable Trading Month, each Scheduling Coordinator shall receive a credit for its share of the total of all Decline Monthly Charges—Imports and Decline Monthly Charges—Exports assessed to Scheduling Coordinators for the applicable Trading Month. The credits shall be allocated according to the proportion of each Scheduling Coordinator's Measured CAISO Demand to total Measured CAISO Demand for the CAISO Balancing Authority Area during the Trading Month.~~

11.32 Measures to Address Intertie Scheduling Practices

The CAISO will take the following actions regarding Schedules that clear the Day-Ahead Market at the Interties and that are wholly or partially reversed through a FMM Schedule:

- (i) The CAISO will charge the Scheduling Coordinator the positive difference between the Day-Ahead Market price and the FMM LMP applicable to any imports that clear the Day-Ahead Market and are reduced through a Bid to the RTM if the Scheduling Coordinator either: (a) fails to submit an E-Tag or E-Tags consistent with the Scheduling Coordinator's Day-Ahead Schedule and WECC scheduling criteria; or (b) withdraws the E-Tag or E-Tags prior to ~~forty-five (45) minutes before the Trading Hour~~the CAISO's publication of HASP results on the CAISO's secure communication system.
- (ii) The CAISO will charge the Scheduling Coordinator the positive difference between the FMM LMP and the Day-Ahead Market LMP applicable to any exports that clear the Day-Ahead Market and are reduced through a Bid to the RTM if the Scheduling Coordinator either: (a) fails to submit an E-Tag or E-Tags consistent with the Scheduling Coordinator's Day-Ahead Schedule and WECC scheduling criteria; or (b) withdraws the E-Tag or E-Tags prior to forty-five (45) minutes before the Trading Hour.
- (iii) If a Scheduling Coordinator reduces a Day-Ahead import or export Schedule through a

Bid to the RTM and submits Schedules on behalf of, or is, a CRR Holder, then the reduction to the import or export may be treated as a Virtual Award for purposes of adjusting CRR Revenue as further set forth in Section 11.2.4.6.

- (iv) For any import Schedule that clears the Day-Ahead Market which a Scheduling Coordinator reduces through a Bid to the RTM, such reduced quantities will be subject to the allocation of Net RTM Bid Cost Uplift as set forth in Section 11.8.6.6.
- (v) The provisions of this Section 11.32 will not apply to Schedules that clear the Day-Ahead Market at the Scheduling Points and that a Scheduling Coordinator wholly or partially reverses through a Bid to the RTM to the extent such Schedules are valid and balanced ETC, TOR, or Converted Rights Self-Schedules in the Day-Ahead Market.

* * *

30.5.1 General Bidding Rules

* * *

- (r) A Scheduling Coordinator may submit a Variable Energy Resource Self-Schedule for the RTM can be submitted from a Variable Energy Resource. A Scheduling Coordinator can use either the CAISO forecast for Expected Energy in the RTM or can provide its own forecast for Expected Energy pursuant to the requirements specified in Section 4.8.2. The Scheduling Coordinator must indicate in the Master File whether it is using its own forecast or the CAISO forecast for its resource in support of the Variable Energy Self-Schedule. The Scheduling Coordinator is not required to include the same MWh quantity for each of the four fifteen (15)-minute intervals that make up the applicable Trading Hour for the Variable Energy Resource Self-Schedule include. If an external Variable Energy Resource that is not using a forecast of its output provided by the CAISO submits a

Variable Energy Resource Self-Schedule and the Expected Energy is not delivered in the FMM, the Scheduling Coordinator for the Variable Energy Resource will be subject to the Under/Over Delivery Charge Decline Potential Charge as described in Section 11.31.

Scheduling Coordinators for Dynamically Scheduled Variable Energy Resources that provide the CAISO with a two-hour rolling forecast with five-minute granularity can submit Variable Energy Resource Self-Schedules.

* * *

30.5.7 E-Tag Rules and Treatment of Intertie Schedules

In addition to complying with all generally applicable E-Tagging requirements, Scheduling Coordinators must submit their E-~~T~~tags consistent with the requirements specified in this Section ~~30.6.2~~ 30.5.7. If a Scheduling Coordinator receives an intra-hour Schedule change, then the Scheduling Coordinator must, by twenty minutes before the start of the FMM interval to which the Schedule change applies, ensure that an updated energy profile reflects the change. Absent extenuating circumstances, the CAISO automatically updates Energy profiles on E-~~T~~tags for Energy Schedules that change from HASP to the FMM within a Trading Hour. In performing this service for a Scheduling Coordinator, the CAISO does not assume any responsibility for compliance with any E-~~T~~tag requirements or obligations to which the Scheduling Coordinator is subject. The changed energy profile will apply for the balance of the operating hour unless it is subsequently changed by a further updated energy profile.

30.5.7.1 Self-Scheduled Hourly Blocks

By forty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag (or set of E-Tags) that passes CAISO E-Tag validation procedures and that supports the Self-Schedule Hourly Block.

The transmission profile of the E-Tag at forty minutes prior to the applicable Trading Hour must be equal to the Self-Schedule Hourly Block. If the Scheduling Coordinator has a transmission profile less than its advisory Energy schedule, then the CAISO will limit the schedule for Energy in the FMM so that it does

not exceed the quantity of the transmission profile.

The Scheduling Coordinator may revise the Energy profile up to twenty minutes prior to the applicable Trading Hour but the quantity of the Energy profile must be equal to the quantity of the Self-Schedule Hourly Block by twenty minutes prior to the applicable Trading Hour. The CAISO may modify the Energy profile due to Reliability related curtailments.

By twenty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag in support of Self-Scheduled Hourly Blocks. If the Scheduling Coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM Schedule associated with the Self-Schedule Hourly Block to zero for each FMM interval of the hour.

The transmission profile must be greater than or equal to the Energy profile, and the Energy profile must equal the Self-Scheduled Hourly Block. The CAISO may modify the Energy profile due to Reliability related curtailments.

30.5.7.2 Variable Energy Resource Self-Schedule

By forty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag (or set of E-Tags) that passes CAISO E-Tag validation procedures and that supports the Variable Energy Resource Self-Schedule.

The transmission profile of the E-Tag at forty minutes prior to the applicable Trading Hour must be equal to the Variable Energy Resource Self-Schedule. If the Scheduling Coordinator has a transmission profile less than its advisory Energy schedule, then the CAISO will limit the schedule for Energy in the FMM so that it does not exceed the quantity of the transmission profile.

The Scheduling Coordinator may revise the Energy profile up to twenty minutes prior to the applicable Trading Hour but the quantity of the Energy profile must be equal to the quantity of the Variable Energy Resource Self-Schedule by twenty minutes prior to the applicable Trading Hour. The CAISO may modify the Energy profile due to Reliability related curtailments.

If the Scheduling Coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM Schedule associated with the Variable Energy Resource Self-Schedule to zero for each FMM interval of the hour.

~~By twenty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag in support of a Variable Energy Resource Self-Schedule. The transmission profile must be greater than or equal to the Energy profile, and the Energy profile must equal the Variable Energy Resource Self-Schedule. The CAISO may modify the Energy profile due to Reliability related curtailments.~~

30.5.7.3 Economic Hourly Bid

By forty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag (or set of E-Tags) that passes CAISO E-Tag validation procedures and that supports the Economic Hourly Block Bid.

The transmission profile of the E-Tag at forty minutes prior to the applicable Trading Hour must be equal to the Economic Hourly Block Bid. If the Scheduling Coordinator has a transmission profile less than its advisory Energy schedule, then the CAISO will limit the schedule for Energy in the FMM so that it does not exceed the quantity of the transmission profile.

The Scheduling Coordinator may revise the Energy profile up to twenty minutes prior to the applicable Trading Hour but the quantity of the Energy profile must be equal to the quantity of the Economic Hourly Block Bid by twenty minutes prior to the applicable Trading Hour. The CAISO may modify the Energy profile due to Reliability related curtailments.

If the Scheduling Coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM Schedule associated with the Economic Hourly Block Bid to zero for each FMM interval of the hour.

~~By twenty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag in support of an Economic Hourly Block Bid. The transmission profile must be greater than or equal to the Energy profile, and the Energy profile must equal the Economic Hourly Block Bid as awarded through HASP. The CAISO may modify the Energy profile due to Reliability related curtailments.~~

30.5.7.4 Economic Hourly Block Bid with Intra-Hour Option

By forty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag (or set of E-Tags) that passes CAISO E-Tag validation procedures and that supports the Economic Hourly Block Bid with Intra-Hour Option. The transmission profile of the E-Tag at forty minutes prior to the applicable Trading Hour must be equal to the Economic Hourly Block Bid with Intra-Hour Option. If the

Scheduling Coordinator has a transmission profile less than its advisory Energy schedule, then the CAISO will limit the schedule for Energy in the FMM so that it does not exceed the quantity of the transmission profile.

The Scheduling Coordinator may revise the Energy profile up to twenty minutes prior to the applicable Trading Hour but the quantity of the Energy profile must be equal to the quantity of the Economic Hourly Block Bid with Intra-Hour Option by twenty minutes prior to the applicable Trading Hour. The CAISO may modify the Energy profile due to Reliability related curtailments.

If the Scheduling Coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM Schedule associated with the Economic Hourly Block Bid with Intra-Hour Option to zero for each FMM interval of the hour.

~~By twenty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag in support of an Economic Hourly Block Bid. The transmission profile must be greater than or equal to the Energy profile, and the Energy profile must equal the Economic Hourly Block Bid as awarded through HASP. The CAISO may modify the Energy profile due to Reliability related curtailments.~~

In the case of an intra-hour redispatch from the FMM, the CAISO may increment or decrement the Energy profile to correspond to the intra-hour redispatch. The MW level to which the FMM can redispatch an Economic Hourly Block Bid with Intra-Hour Option above its HASP Advisory Schedule is limited by the quantity of the transmission profile submitted by forty minutes prior to the applicable Trading Hour.

30.5.7.5 FMM Economic Bid

By forty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag (or set of E-Tags) that passes CAISO E-Tag validation procedures and that supports the FMM Economic Bid.

The transmission profile of the E-Tag at forty minutes prior to the applicable Trading Hour must be greater than or equal to the FMM Economic Bid. If the Scheduling Coordinator has a transmission profile less than its advisory Energy schedule, then the CAISO will limit the schedule for Energy in the FMM so that it does not exceed the quantity of the transmission profile.

The Scheduling Coordinator may revise the Energy profile up to twenty minutes prior to the applicable Trading Hour but the quantity of the Energy profile must be equal to the quantity of the FMM energy schedule by twenty minutes prior to the applicable Trading Hour. The CAISO may modify the Energy profile due to Reliability related curtailments.

If the Scheduling Coordinator fails to submit a valid E-Tag consistent with these deadlines, then the CAISO will set the MW quantity of the FMM Schedule associated with the FMM Economic Bid to zero for each FMM interval of the hour.

~~By twenty minutes prior to the applicable Trading Hour, the Scheduling Coordinator must submit an E-Tag in support of a FMM Economic Bid. The transmission profile must be greater than or equal to the maximum bid-in capacity for the Trading Hour, and the Energy profile must equal the MWs awarded for the first FMM interval of the Operating Hour.~~

Scheduling Coordinators with cleared FMM Economic Bids may update either the transmission profile or the Energy profile after the relevant deadlines. A Scheduling Coordinator choosing to update the transmission profile must submit an updated transmission profile at least 40 minutes prior to the applicable FMM interval. A Scheduling Coordinator choosing to update the Energy profile must submit an updated Energy profile at least 20 minutes prior to the applicable FMM interval.

~~If the Scheduling Coordinator intends to limit its participation in the FMM to the quantity in the HASP advisory energy schedule (including zero), the Scheduling Coordinator may update its transmission profile to the maximum amount it wants to make available to the FMM prior to the start of the binding FMM optimization, which is no earlier than thirty-seven and a half minutes before the applicable Trading Hour. If the Scheduling Coordinator does not have a transmission profile greater than or equal to its advisory Energy schedule, then the CAISO will limit the schedule for Energy in the FMM so that it does not exceed amounts greater than what is listed in the transmission profile. Cleared FMM Economic Bids are eligible for Bid Cost Recovery as specified in Section 11.8.~~

* * *

Appendix A

Master Definition Supplement

~~-Decline Monthly Charge—Exports~~

~~A charge that applies to the aggregate of a Scheduling Coordinator's HASP Block Intertie Schedules for Energy exports that are not delivered in a Trading Month, as determined pursuant to Section 11.31.1.~~

~~-Decline Monthly Charge—Imports~~

~~A charge that applies to the aggregate of a Scheduling Coordinator's HASP Block Intertie Schedules for Energy imports that are not delivered in a Trading Month, as determined pursuant to Section 11.31.1.~~

~~-Decline Potential Charge—Exports~~

~~A potential charge that is calculated for any HASP Block Intertie Schedule for an Energy export when the HASP Block Intertie Schedule is not delivered for any reason, which potential charge and its applicability are determined pursuant to Section 11.31.~~

~~-Decline Potential Charge—Imports~~

~~A potential charge that is calculated for any HASP Block Intertie Schedule for an Energy import when the HASP Block Intertie Schedule is not delivered for any reason, which potential charge and its applicability are determined pursuant to Section 11.31.~~

~~-Decline Threshold Percentage—Imports/Exports~~

~~The rate at which Scheduling Coordinators may fail to deliver imports or exports in accordance with HASP Block Intertie Schedules without incurring Decline Monthly Charges—Imports or Decline Monthly Charges—Exports, as measured by the respective percentages of HASP Block Intertie Schedules for import or export MWh quantities that the Scheduling Coordinator does not deliver during a Trading Month. The Decline Threshold Percentage—Imports/Exports is ten percent (10%).~~

~~-Decline Threshold Quantity—Imports/Exports~~

~~The MWh quantity of HASP Block Intertie Schedules for imports or exports of Energy that a Scheduling Coordinator may fail to deliver during a Trading Month without incurring Decline Monthly Charges—Imports or Decline Monthly Charges—Exports. The Decline Threshold Quantity—Imports/Exports is 300 MWh.~~

* * *

- Under/Over Delivery Charge

For a given Intertie transaction that has an Under/Over Delivery Quantity for a FMM interval, a charge equal to the product of the Under/Over Delivery Price and Under/Over Delivery Quantity.

- Under/Over Delivery Price

The price, as further specified in Section 11.31.2, a Scheduling Coordinator is charged for deviations between Energy awarded at an Intertie and Energy delivered at that Intertie.

- Under/Over Delivery Quantity

The quantity of Energy at an Intertie, as further specified in Section 11.31.1, the CAISO deems either under- or over-delivered relative to awarded Energy for purposes of charging a fee for such under- or over-deliveries.