



Intertie Deviation Settlement

Straw Proposal

October 8, 2018

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1. Purpose

The purpose of this initiative is to incentivize delivery of awarded energy on interties to improve operational awareness and grid reliability. Intertie resources that do not meet their cleared market schedules cause impacts on market pricing and grid stability. The *Intertie Deviation Settlement* initiative will analyze the existing Intertie Decline Charge and ultimately propose a new settlement methodology for undelivered intertie resources. The desired outcome of this initiative is to provide economic incentives for the delivery of intertie resources. The ISO expects this initiative to lead to more accurate estimates of the net scheduled interchange, increased grid reliability, and accurate market pricing.

What is the problem we aim to solve? When market participants fail to deliver intertie resources, grid operators and the ISO markets face operational challenges that can result in high prices, manual processes, and sub-optimal market solutions. The ISO's *Intertie Deviation Settlement* initiative aims to reduce the amount of declined and undelivered intertie resources.

What expectations guide our decision making? The primary objective of the ISO as a balancing authority operator is to maintain operational reliability of the bulk electric grid. The ISO's security constrained economic dispatch allows for optimal dispatch of generators to serve load across the balancing authority area. Accurate pricing signals are critical to provide economic incentive to participants in the ISO markets.

1.1 Response to Stakeholder Comments

The ISO appreciated stakeholder comments in response to the *Intertie Deviation Settlement* issue paper. This straw proposal includes a response to stakeholder comments, including:

- Additional data analysis to show the magnitude of deviations in comparison to the decline charge
- Explanation of why scheduling coordinators may elect to decline or not submit an E-Tag for awarded import or export energy
- Proposal to replace the existing decline charge with a new under/over delivery charge
- Attached settlement worksheet explains difference between existing decline charge and proposed under/over delivery charge

Stakeholder comments that are outside of the scope of this proposal are addressed in [Section 8](#).

2. References

The following documents are referenced throughout the document and can be found at the respective links.

Business Practice Manual (BPM) for Market Operations:

<https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Market%20Operations>

Settlements and Billing BPM Configuration Guide Charge Code 6455 Intertie Schedules Decline Charges:

https://bpmcm.caiso.com/BPM%20Document%20Library/Settlements%20and%20Billing/Configuration%20Guides/HASP-RT/BPM%20-%20CG%20CC%206455%20Intertie%20Schedules%20Decline%20Charges_5.9.doc

Settlements and Billing BPM Configuration Guide Charge Code 6457 Intertie Schedules Decline Charges Allocation:

https://bpmcm.caiso.com/BPM%20Document%20Library/Settlements%20and%20Billing/Configuration%20Guides/HASP-RT/BPM%20-%20CG%20CC%206457%20Intertie%20Schedules%20Decline%20Charges%20Allocation_5.1a.doc

Declined Predispatched Intertie Bids – White Paper, 2007:

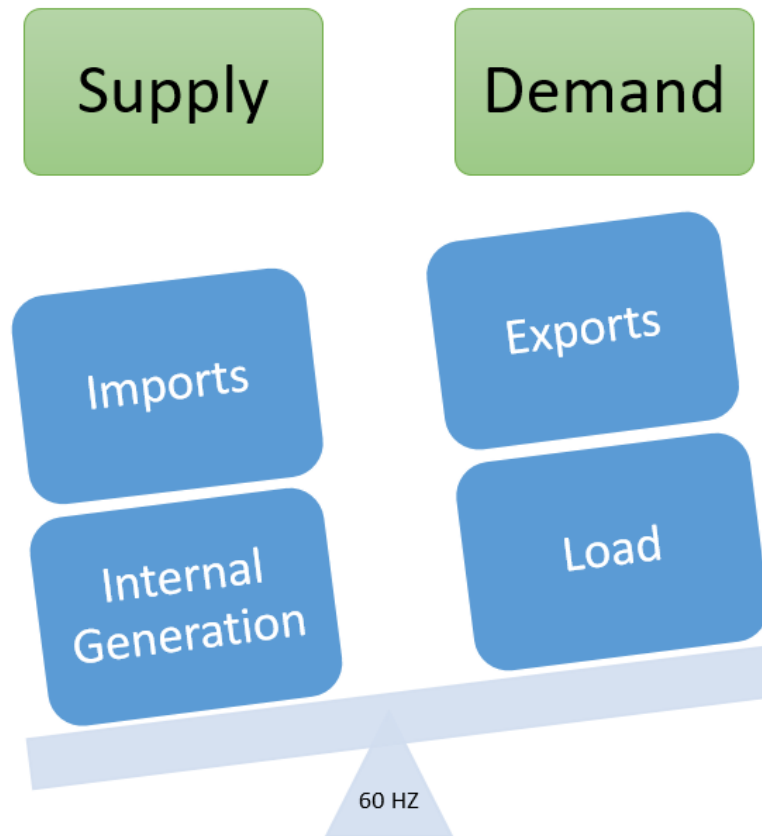
<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=561FB99F-13BA-4B61-93EC-FAA77D134A55>

3. Background

It is the responsibility of the ISO to ensure there is enough energy supply to meet load across the balancing authority area footprint. Maintaining the balance between supply and demand will ensure stability of the bulk electric grid.

Internal supply sources and interchange, which is energy imported and exported across interties, are used to serve load across the ISO's balancing authority area. An intertie is an interconnection permitting the flow of electric power (current) between two or more electric utility systems. illustrates how a grid operator must ensure there is adequate supply to serve demand and maintain reliability.

Figure 1: Supply and demand must be balanced to maintain a grid stability. Supply is composed of internal generation and interchange (imports/exports).¹



When an inertie resource receives a market award to import energy into the balancing authority area but does not deliver the awarded energy, the grid operator must maintain system balance by increasing internal supply or finding another inertie resource to import from.

3.1 Interties, Market Timing, and E-Tagging

Intertie resources can submit bids and receive energy awards in both the day-ahead and real-time markets. Because inertie resources can submit bids indicating a price at which they are willing to buy or sell energy, it is expected if awarded in the day-ahead and real-time market, inertie resources will accept the award and deliver the awarded energy.

The tariff defines inertie resources as “system resources”, which can be associated with a specific generator or a balancing authority area’s portfolio of generating resources. A **system resource** is a group of resources, single resource, or portion of a resource located outside of the CAISO balancing authority area. System resources are categorized as dynamic or non-dynamic. A **dynamic system**

¹ Internal generation includes any supply source internal to the ISO balancing authority area and includes demand response or other energy sources that do not require rotating mass.

resource is a type of system resource that is tied to a specific generator and has contractual agreements to respond to CAISO market dispatches every 5 minutes in the real-time dispatch. A **non-dynamic system resource** is a system resource that is not capable of submitting a dynamic schedule. It may be a collection of resources and not necessarily tied to a specific generator. Non-Dynamic System Resources are not capable of responding to 5-minute dispatches and instead participate in the ISO's real-time 15-minute market.

Henceforth, this paper will use the term *intertie resource* instead of *system resource*. Additionally, for clarification purposes, when this paper uses the term *intertie resources*, it refers to non-dynamic system resources because dynamic resources are excluded from the Decline Charge policy on the rationale that those resources behave similar to internal generators.

Scheduling Coordinators can elect one of several bid options for intertie resources. Intertie resources that are statically scheduled into the ISO (non-dynamic system resources) can bid using the following options²:

Self-scheduled hourly block. An intertie resource bid that is a price taker. A self-scheduled hourly block will be awarded in the hour-ahead scheduling process and settle at the fifteen-minute market locational marginal price. The schedule must remain constant throughout the operating hour and is unable to be dispatched on a fifteen minute basis.

Economic hourly block. An intertie resource bid that specifies a price. The economic hourly block intertie resource will only clear if the bid is economic in relation to the locational marginal price in the hour-ahead scheduling process. The schedule must remain constant throughout the operating hour and is unable to be dispatched on a fifteen minute basis. The schedule is a price taker in the fifteen-minute market and thus settles at the fifteen-minute market price.

Economic hourly block with intra-hour option. An intertie resource bid that specifies a price. The economic hourly block intertie resource will only clear if the bid is economic in relation to the locational marginal price for the balance of the operating hour. The schedule can only change one time during the operating hour. If the schedule is changed intra-hour, the resource becomes a price taker for the balance of the hour and is settled at the fifteen-minute market locational marginal price.

Economic. An intertie resource bid that specifies a price. The economic hourly block intertie resource will only clear if the bid is economic in relation to the locational marginal price. The schedule can change every fifteen-minute interval as scheduled by the fifteen-minute market.

Economic variable energy resource. A variable energy resource that is economically bid as an intertie resource. The variable energy resource submits a forecast into the scheduling infrastructure and business rules (SIBR) application. The forecast is used to determine the

² Additional information can be found in the BPM for Market Operations section 7.6.3.2: Treatment of System Resources.

maximum amount that the resource can be scheduled to. The economic variable energy resource schedule can change every fifteen-minute interval as scheduled by the fifteen-minute market.

Market schedules are published at the top of the scheduling hour when a scheduling coordinator bids into the real-time market using the hourly block or intra-hour change option.³ The dispatch is published in the CAISO market results interface (CMRI) application and the automated dispatch system (ADS).⁴ Once the award is published, the scheduling coordinator has approximately five minutes to “accept”, “partially accept”, or “decline” the award. Once the award has been accepted, partially accepted, or declined, the new amount is reflected as the *automated dispatch system accepted value*.

Accept means the award is fully accepted at dispatched value.

Partially accept means the award is accepted at a value below the day-ahead and/or hour-ahead scheduling process award.

Declined means the market award is fully declined and 0 MW will be delivered.⁵

Figure 2: Examples for hourly block resources that accept, partially accept, and decline awards in the automated dispatch system.

Day-ahead market award	Hour-ahead scheduling process instruction	Hour-ahead scheduling process award	Scheduling coordinator action	Automated dispatch system accepted value
150 MW	No change	150 MW	Accept	150 MW
150 MW	+ 50 MW (INC)	200 MW	Accept	200 MW
150 MW	- 50 MW (DEC)	100 MW	Partially accept	125 MW
150 MW	+ 50 MW (INC)	200 MW	Partially accept	175 MW
150 MW	- 100 MW (DEC)	50 MW	Decline	0 MW

During the five-minute window, the scheduling coordinator accepts, partially accepts, or declines, the award in the automated dispatch system. If the scheduling coordinator does not respond to the dispatch, the award is automatically accepted at the end of the five-minute window. The scheduling

³ Here forward, the term “hourly block” will be inclusive of the intra-hour change option.

⁴ The scheduling hour is defined as the hour prior to the operating hour. For example, if the operating hour ends at 10:00AM (also known as HE10, which corresponds to 9:00AM – 10:00AM), the scheduling hour will end at 9:00AM (also known as HE9, which corresponds to 8:00AM – 9:00AM).

⁵ For the purpose of this paper, the term “decline” is inclusive of “partially accept” unless specified differently. Generally, the term “decline” refers to a scheduling coordinator not fully accepting an award in the automated dispatch system.

coordinator can call the ISO operator and request the award be manually changed up until T-40.⁶ The scheduling coordinator is then responsible to submit an E-Tag to serve as confirmation of the transaction.

Information contained on an E-Tag is like a receipt. It shows the scheduled energy (in MWs) that a scheduling coordinator agrees to deliver for a specified duration of time. Additionally, an E-Tag contains a contract path detailing how energy will be delivered to a specified location based on transmission purchased by the scheduling coordinator. For example, an E-Tag may depict a 100 MW transaction, sourcing in BPA and sinking in CAISO across the MALIN500 intertie for HE10. In this example, the E-Tag has an energy profile of 100 MW to match the ISO market award; it also has a transmission profile of at least 100 MW to indicate the scheduling coordinator has procured transmission to accommodate the energy transfer. Grid operators verify the scheduling coordinator's E-Tag information to ensure the scheduled energy matches the awarded energy.

The ISO's *Business Practice Manual for Market Operations* states an E-Tag must be submitted before T-20 (20 minutes prior to the operating hour).⁷ This requirement is set forth by the North American Energy Standards Board (NAESB). However, the ISO's fifteen-minute market runs 37.5 minutes prior to the operating hour to determine the final market award. Consequently, it is ideal for hourly block E-Tags to be submitted at T-40 because E-Tag data is used as a market input. This allows time for the hourly block E-Tag to be received and processed in advance of the market run. For intertie resources that submit economic bids that can be scheduled in the fifteen-minute market, the E-Tags must be submitted prior to T-40 with a transmission profile that supports the intertie resources bid range. The market uses the transmission profile from the E-Tag to ensure the resource is not scheduled above the lowest external transmission path outside the CAISO.

The ISO receives E-Tags through its interchange transaction scheduler (ITS) system. The ITS system produces a receipt of E-Tags and allows ISO operators to calculate the net scheduled interchange and verify scheduling limits are not exceeded for the upcoming operating hour. The NSI feeds directly into the area control error (ACE), which measures how well the balancing authority area is balancing load and supply. NERC standards are in place to ensure the area control error is appropriately controlled. Therefore, the net scheduled interchange (the total of all E-Tags) is a critical component in maintaining balance between supply and demand and adhering to NERC standards.

⁶ Reference the CAISO *Business Practice Manual for Market Operations*, Section 7.8.3.1.3: *ADS Decline Functionality for Non-Dynamic System Resource Instruction*.

⁷ The CAISO *Business Practice Manual for Market Operations* requires E-Tags be submitted no later than 20 minutes prior to the operating interval (T-20). This is in accordance with the E-Tagging specifications maintained by the NAESB. Reference the *Business Practice Manual for Market Operations*, Section 8 - *Tagging* for additional information.

3.2 Declined Award

The ISO expects hour-ahead scheduling process awards will be accepted by scheduling coordinators. Scheduling coordinators submit bids, and if the market clears at a price in which the bid is awarded, it is assumed the schedule should be accepted. A submitted bid should be a firm offer to deliver the offered energy at the bid price.

Occasionally, conditions prohibit a scheduling coordinator from delivering awarded energy such as transmission outages, generation outages, or occasionally economic considerations. When those instances occur, the business practice manual requires the scheduling coordinator to notify the ISO of the un-deliverable energy. Intertie declines are critical information for the ISO operator as they provide additional time for operations to resolve system balance. Scheduling coordinators may notify the ISO through the automated dispatch system or by a phone call to the ISO operator before T-40. When the scheduling coordinator notifies the ISO of the intertie decline in advance, it is more likely that the 15-minute market will have adequate time to economically schedule and/or commit replacement energy. However, insufficient notice of the intertie decline will leave the replacement energy to be resolved by the 5-minute real-time dispatch which does not have the ability to commit additional resources if needed.

Let's assume the following example:

Net scheduled interchange as awarded by the hour-ahead scheduling process = 5,000 MW

Awards accepted by scheduling coordinators = 4,500 MW

Awards declined by scheduling coordinators = 500 MW

Net scheduled interchange used as an input to the fifteen-minute market = 4,500 MW

In this scenario, the scheduling coordinator declined 500 MW at the beginning of the scheduling hour. This enabled the fifteen-minute market to recognize the 500 MW shortage and economically schedule and/or commit additional resources to make up for the discrepancy. Additionally, the balancing authority area operator had adequate time to manually dispatch resources, if necessary.

Intertie declines, particularly when they involve especially large MW values or multiple concurrent declines from multiple scheduling coordinators, can cause significant operational and reliability problems. Additionally, when a scheduling coordinator accepts an energy award, but does not submit an E-Tag there are additional market inefficiencies and operational concerns.

3.3 Undelivered Energy (no E-Tag)

When energy on the interties cannot be delivered, scheduling coordinators should notify the ISO with as much notice as possible. However, not all scheduling coordinators follow the ISO's best practice of declining hourly block intertie awards by T-40. Occasionally, scheduling coordinators do not take action when awards are published in the automated dispatch system – this results in the award being auto-accepted on behalf of the scheduling coordinator. In turn, the market assumes the energy will be delivered.

Let's assume a second example:

Net scheduled interchange as awarded by the hour-ahead scheduling process = 5,000 MW

Awards accepted by scheduling coordinators = 4,500 MW

Awards *automatically* accepted by the automated dispatch system = 500 MW

Net scheduled interchange used as an input to the fifteen-minute market = 5,000 MW

In this scenario, the automated dispatch system automatically accepted 500 MW on behalf of the scheduling coordinator. However, the scheduling coordinator is unable to deliver the energy and did not submit an E-Tag. When this occurs, the fifteen-minute market assumes 5,000 MW will be delivered on the interties because a total of 5,000 MW shows as accepted in automated dispatch system. In reality, only 4,500 MW will be delivered. The undelivered intertie energy (no E-Tag) won't be recognized in the market until the real-time dispatch 5-minute market run.⁸

Undelivered energy (no E-Tag) on the interties can have serious negative impacts on grid reliability. Once the grid operator recognizes the shortage, the operator is unable to schedule additional energy on the interties due to the NAESB E-Tagging timeline of T-20. It is also too late to manually schedule energy on the interties.⁹ The real-time dispatch will recognize the shortage and dispatch energy, but cannot commit additional resources. As a result, the energy may be expensive or unavailable without emergency actions and could even lead to capacity procurement mechanism (CPM) designations.

For example, if an intertie resource under-delivers by 250 MW, the fifteen-minute market has already run, thus cannot account for this energy. Therefore, the real-time dispatch must dispatch an additional 250 MW. Assuming there are limited internal supply resources available, pricing may increase in order

⁸ The fifteen-minute market will recognize the shortage during the third and fourth intervals of the operating hour. The market timing is discussed more in Section 5.2: Intertie Declines Examples.

⁹ Exceptional dispatches on the interties must occur with enough time for the ISO operator to make verbal agreement and the scheduling coordinator to submit an E-Tag.

to accommodate the need for an additional 250 MW. Therefore, the 250 MW inertie shortage directly affected pricing throughout the real-time market.

Figure 3: Difference between Inertie Decline and No E-Tag.

Name	Description	Impact
Inertie decline (or partially accept)	Energy award is declined in the automated dispatch system or via phone call before T-40	The grid operator is aware the energy will not be delivered and likely has adequate time to economically schedule and/or commit additional energy through the market systems or an exceptional dispatch.
No E-Tag	Energy award is accepted but not delivered in real time	The grid operator is <u>un</u> aware the energy will not be delivered until T-20. This energy shortage at the beginning of the ramp for the corresponding interval leaves the operator an extremely limited time to respond and there is potentially very limited resources available for dispatch. This may lead to CPM.

In summary, the ISO expects all awards be delivered and finds it optimal if there are no inertie declines at all. However, if the full dispatch cannot be delivered, it is better for scheduling coordinators to notify the ISO by T-40. When an award is accepted but an E-Tag is not submitted, there are challenges for the ISO operator and the market.

4. Issue Paper: Decline Charge Policy is Outdated

4.1 Current Decline Charge

In spring of 2007, the ISO experienced an unusually high amount of declines, which led the ISO's Department of Market Monitoring (DMM) to analyze the issue. DMM concluded that bidding behavior may have contributed to the spring event. ISO Management then determined the ISO's current tariff provisions did not provide clear guidance on expected bidding behavior or consequences for undelivered import or export bids. Consequently, the ISO conducted the *Charge for Undelivered Import or Export Bids* stakeholder initiative to make tariff provisions clearer.

The ISO determined with stakeholders that a financial charge for declines would discourage excessive declines of pre-dispatched real-time bids from imports and exports. However, because unpredictable events may occur, the decline charge only applies if the scheduling coordinator fails to deliver 10% or more of total inertie transactions (in the import and export directions separately) or 300 MWh, whichever is greater. The total undelivered value is calculated in MWh over the course of a month to determine if the 10% threshold (or 300 MWh, whichever is greater) has been exceeded. If inertie

declines are less than 10% of total transactions, no charge applies. If intertie declines are greater than or equal to 10% of total transactions, the market participant is subject to the decline charge. The decline charge is equal to is the maximum of \$10.00 or 50% of the fifteen-minute market locational marginal price per MW that exceeds the 10% threshold.

At the time the policy was implemented, ISO settlement system had no way to distinguish between an intertie decline and a reliability curtailment. It only had visibility to the hour-ahead schedule process schedules and final E-Tag values. Therefore, the total amount of “declines” could have also included E-Tags that were curtailed for reliability reasons – curtailments that were not the fault of the market participant but still counted towards the decline charge. This contributed to the need to have a threshold to determine if the decline charge should apply or not.

At the time the original policy was developed, there was “widespread agreement that there should be a mechanism that discourages market participants from submitting bids that they do not have a reasonable expectation of delivering”.¹⁰ Stakeholders disagreed on how the ISO would define “reasonable” through the threshold amount. Some stakeholders criticized the 10% threshold as being too high. They argued a 10% threshold would open the door for speculative behavior and reliability concerns from scheduling coordinators who were currently at a 5% decline threshold. Any threshold above 5%, they argued, would incentivize scheduling coordinators to decline more and negate the intent of the ISO’s policy.

The ISO ultimately decided to use a 10% threshold because it would provide scheduling coordinators sufficient “headroom” to remain below the threshold if conditions outside their control arose.¹¹ It would be the responsibility for the market participant to track monthly their declines and remain below the threshold. Ultimately, the policy balanced limiting the number of declines and ensuring sufficient energy bids were available for reliability.

4.2 FERC Order 764 Impacts

Historically, interchange (imports and exports) bids were scheduled by ISO/RTO’s on an hourly basis. The Federal Energy Regulatory Commission (FERC) issued Order No. 764, which required all public utilities to revise their open access transmission tariffs to include the option of using intra-hour transmission scheduling at 15-minute intervals. The requirement to implement 15-minute transmission scheduling only applied to intertie transactions in organized wholesale energy markets. The California ISO

¹⁰ Declined Predispatched Intertie Bids – White Paper, 2007:
<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=561FB99F-13BA-4B61-93EC-FAA77D134A55>

¹¹ See *Cal. Indep. Sys. Operator Corp.*, Transmittal Letter to Tariff Amendment to (Both Current and MRTU) to Implement a Charge for Undelivered Import or Export Bids, Docket No. ER8-628-000 (February 29, 2008) at p. 6.

implemented this requirement through the initiative, *FERC Order No. 764 Market Changes*. This initiative also introduced binding 15-minute scheduling and settlement for both internal and intertie resources.

As a result of the *FERC Order No. 764 Market Changes* initiative, the hour-ahead scheduling process no longer determines financially binding locational marginal prices. Prior to Order 764 implementation the hour-ahead scheduling process was binding because it produced a single schedule and a single price for the entire hour. With FERC 764, hourly pricing was eliminated. Now, the ISO produces prices for each 15-minute interval.

To accommodate intertie resources that cannot change schedules every 15-minutes, the ISO created an “hourly block” option. This allows intertie resources to keep the same schedule for all four 15-minute intervals. However, the schedule will be individually settled at the fifteen-minute market price for each interval.

At the time of the FERC 764 implementation, the ISO determined no changes to the decline charge were necessary. Since then, the ISO has recognized impacts of undelivered interties. Specifically, the ISO has identified that scheduling coordinators are not delivering awarded energy (no submission of an E-Tag) instead of declining awards at the beginning of the scheduling hour. The ISO analyzed the available data to understand the magnitude and impact of undelivered intertie resources. The analysis can be found in [Section 5: Impact of Intertie Declines](#).

4.3 Energy Imbalance Market

The energy imbalance market (EIM) design does not include intertie bidding. Therefore, EIM is not subject to the decline charge. Reviewing and assessing EIM’s current policy for intertie bidding is outside the scope of this initiative.

5. Impact of Undelivered Intertie Resources

This section quantifies the magnitude of undelivered intertie schedules. Additionally, this section provides examples that explain the operational and settlement impacts of no E-Tag submitted as opposed to declined awards by T-40.

Please note, these examples have been simplified for educational purposes. The full settlement of an hourly-block intertie resource and the applicable decline charge (charge code 6455) is included in Appendix A.

5.1 Operational Impacts of Intertie Declines

As explained in [Section 3: Background](#), undelivered energy caused by the failure to submit an E-Tag has more significant operational impacts than declining an award in the automated dispatch system prior to the fifteen-minute market run.

Envision the following scenario:

A scheduling coordinator bids into the ISO's real-time market and receives a 500 MW award through the hour-ahead scheduling process. The scheduling coordinator does not take action when the schedule is first published and a 500 MW award is automatically accepted by the automated dispatch system. Later in the scheduling hour, the scheduling coordinator decides not to deliver the awarded energy due to economic considerations. Although the award was accepted, the scheduling coordinator does not submit an E-Tag. At this point, the ISO is still anticipating delivery of 500 MW across the interties and will not recognize the shortage until after T-20. At that point, it is too late for the fifteen-minute market to schedule additional energy on the interties. Instead, regardless of cost, the five-minute market must dispatch 500 MW of supply.

It is a significant operational burden when E-Tags are not submitted for awarded energy on the interties. Operators would prefer to receive advanced notification of the decline **before** T-40 because it would allow operators to schedule additional energy.

This paper focuses on the decline and/or failure to deliver awarded import awards on the interties. The ISO is a net importer, and therefore the decline of imports is more common than the decline of exports. However, it is important to note that the decline and/or failure to deliver awarded export awards can impact the ISO as well. When an export award is declined, the ISO ends up with more energy than the market awarded. Export declines can result in decreased prices, which makes it more expensive to dispatch internal generation down in the real-time dispatch.

5.2 Intertie Declines Examples

The ISO always expects hour-ahead scheduling process awards will be accepted. This is the best outcome for operators and the market. However, if an award cannot be delivered, there is operational benefit in having advance notification of the intertie decline. That being said, based on the current decline charge, there is an economic incentive not to provide advance notification of undeliverable energy on the interties.

Since the FERC 764 implementation, the decline charge is more severe when a scheduling coordinator declines an award in advance as opposed to not submitting an E-Tag. This settlement consequence contradicts the ISO's best practice of declining awards in advance to improve situational awareness for the operators as well as improve market outcomes. Additionally, an E-Tag that is curtailed for reliability reasons has the same impact as not delivering an E-Tag even though the scheduling coordinator is not at fault for the discrepancy. These concepts are explained further in the examples below.

Definitions

The following terms have been defined as they relate to intertie transaction, the settlement of intertie transactions, and the decline charge.

Figure 4: Settlement terms in relation to declined or undelivered intertie resources and the decline charge.

Term	Acronym	Definition
Total Expected Energy	TEE	Final dispatch instruction. For intertie resources, this is typically the fifteen-minute market binding award. ¹²
Instructed Imbalance Energy	IIE	Instructed change between market runs. For interties, this may be the difference between day-ahead and fifteen-minute market awards.
Uninstructed Imbalance Energy	UIE	Uninstructed deviation from the real-time market dispatch. Compares the meter value (what was delivered) to the total expected energy (final dispatch instruction). <u>Interties do not have metered values, therefore there is no uninstructed imbalance energy for generic intertie system resources.</u> ¹³

¹² If an intertie resource is exceptionally dispatched, the TEE will be the exceptional dispatch instruction instead of the FMM binding award.

¹³ Dynamic intertie resources are tied to metered data and therefore are settled for UIE.

Operational Adjustment	OA	Comparison of the E-Tag's final energy profile to the total expected energy. ¹⁴
Fifteen-Minute Market Undelivered Quantity		Difference between hour-ahead scheduling process and fifteen-minute market schedules that are not the result of an economic dispatch. ¹⁵
Decline Charge		A charge applied to scheduling coordinators if the total fifteen-minute market undelivered quantity over the course of the month exceeds 10% of total intertie transactions for the corresponding month.
Hour-Ahead Scheduling Process Clawback		A penalty applied if the E-Tag energy profile at T-45 does not match the corresponding day-ahead market award. This is intended to prevent implicit virtual bidding on the interties and incentivize scheduling coordinators to tag day-ahead market awards prior to the hour ahead scheduling process.

Market Timing & Logic

Day-ahead market awards are published at approximately 1PM Pacific Prevailing Time (PPT) prior to the trade date. Day-ahead awards are used in the real-time market optimization; therefore, it is critical that scheduling coordinators submit an E-Tag to match their market award. Market awards that are not tagged by T-45 (45 minutes prior to the operating hour) will be subject to the hour-ahead scheduling process (HASP) clawback. The HASP clawback ensures that day-ahead awards that are bought back in the HASP are backed by physical resources; it is intended to prevent virtual bidding.

Hour-ahead scheduling process awards are published at the top of the scheduling hour. It is expected that energy awarded in the hour-ahead scheduling process will be accepted by the scheduling coordinator. If the scheduling coordinator is unable to deliver the scheduled value, it is his responsibility to partially accept or decline the award in the automated dispatch system. The accepted award is used as an input to the fifteen-minute market. This value is used to clear the fifteen-minute market and determine the appropriate award, which is used for settlement purposes. The fifteen-minute market runs approximately 37.5 minutes prior to the corresponding interval and the results are published approximately 10 minutes after the market run starts.

The fifteen-minute market uses the following logic to determine awards for hourly block intertie resources. It assumes market participants will deliver what has been accepted in the automated dispatch system for the first two intervals of the operating hour. (The E-Tag deadline twenty minutes

¹⁴ OA is settled under IIE. Even though the E-Tag may differ from the FMM instruction at the fault of the scheduling coordinator (could be considered "uninstructed"), there was originally no way to distinguish between instructed and uninstructed changes. Because an E-Tag may be curtailed for reliability reasons by the grid operator, the ISO elected to categorize OA as Instructed Imbalance Energy.

¹⁵ For economic hourly blocks, clearing HASP is economic over the hour. Therefore, any changes that result in the FMM are due to tagging changes and are considered the Undelivered Quantity.

prior to the operating hour is too late for this E-Tag information to be incorporated into the first two intervals). The ADS accepted schedule will become the binding award for interval 1 & 2. For the last two intervals of the operating hour, scheduling coordinators cannot make E-Tag changes. Therefore, the E-Tag value will become the binding award for interval 3 & 4.

Figure 5: Market logic used to determine awards for hourly block intertie resources.¹⁶

FMM Binding Interval of Operating Hour	Time of Operating Hour	RTPD # ¹⁷	Logic Used to Determine Binding Award
1	00 – 15	5	ADS Accepted Award
2	15 – 30	4	ADS Accepted Award
3	30 – 45	7	E-Tag energy profile
4	45 – 00	6	E-Tag energy profile

Based on this logic, if an award is automatically accepted by the automated dispatch system, the fifteen-minute market will assume the award will be delivered for the first two 15-minute intervals of the operating hour. If in reality the E-Tag is not submitted, it is too late to schedule additional energy through the fifteen-minute market for those intervals. Thus, the real-time dispatch is forced to make up for the shortage with internal supply and/or dynamic (or pseudo-tie) generators, dispatching more than it otherwise would have and increasing real-time dispatch prices. The acceptance of an award on the interties combined with the failure to submit an E-Tag directly impacts the real-time market prices.

Additional information related to the existing Decline Charge can be found in the *Settlements and Billing Configuration Guide - Intertie Schedules Decline Charges CC 6455*:

https://bpmcm.caiso.com/BPM%20Document%20Library/Settlements%20and%20Billing/Configuration%20Guides/HASP-RT/BPM%20-%20CG%20CC%206455%20Intertie%20Schedules%20Decline%20Charges_5.9.doc

Examples

Examples 1 – 6 are provided for illustrational purposes. The examples explain the settlement implications for declining before T-40 as opposed to not submitting an E-Tag. While the ISO maintains that all awarded energy should be tagged and delivered, the failure to submit an E-Tag to match a corresponding award creates more operational challenges than declining an award in advance.

¹⁶ Intertie resources with contract rights or transmission operating rights (TOR) can submit an E-Tag any time before T-20 even if there is no bid or market award. Therefore, the fifteen-minute market logic will use the E-Tag value for intertie E-Tags tied to a TOR even if a market award does not exist.

¹⁷ The real-time pre dispatch (RTPD) is the security constrained economic dispatch (SCED) for the fifteen-minute market. It consists of 7 forward looking runs. It starts with RTPD 7, which coincides with the hour-ahead scheduling process run. Each RTPD run gets closer to real-time up until RTPD 1.

The decline charge only applies when the difference between the hour-ahead scheduling process award and the E-Tag energy profile exceed 10% of total transactions. When an award is declined, the total MWh that counts towards the threshold for the month equals the declined value for the entire operating hour. In comparison, when an award is not tagged the total MWh that counts towards the threshold for the month is only effective for half of the operating hour. As a result, scheduling coordinators are less likely to exceed the 10% threshold and be subject to the decline charge when they elect to not tag as opposed to decline before T-40. This outcome is contrary to the operational need to notifying the ISO in advance when energy cannot be delivered.

Example 7 explains a related problem of declining market awards. Due to the nature of net scheduling in the ISO markets (the summation of imports plus exports cannot exceed intertie limits), the decline of an export schedule in combination with the acceptance of import schedules can result in the over-scheduling of an intertie. When this happens, the import schedules are cut but the export schedule flows.

The Intertie *Deviation Settlement Worksheet* is provided as an attachment and can be used to understand pricing impacts and settlement across markets for intertie declines.

Example #1 – Day-ahead market import resource declined

Setup: A resource receives a 100 MW award in the day-ahead market. The scheduling coordinator does not bid into the real-time market, therefore, the award remains at 100 MW. The 100 MW award is *declined* in the automated dispatch system.

	Interval 1	Interval 2	Interval 3	Interval 4
DA Award	100 MW	100 MW	100 MW	100 MW
HASP schedule	100 MW	100 MW	100 MW	100 MW
FMM award	0 MW	0 MW	0 MW	0 MW
E-Tag	0 MW	0 MW	0 MW	0 MW

Settlement: The fifteen-minute market undelivered quantity is 100 MW for intervals 1 – 4. Therefore, 100 MWh is applied towards the end-of-month summation to determine if the 10% threshold is exceeded and the decline charge should be applied. The operational adjustment is 0 MW for all intervals because the E-Tag matches the total expected energy.

Settlement	Quantity	Intervals	MWh
Instructed Imbalance Energy = DA – FMM award at FMM LMP	100 MW	1 – 4	100 MWh
FMM Undelivered Quantity (Decline Charge*) = HASP schedule – FMM award at 50% FMM LMP	100 MW	1 – 4	100 MWh
Operational Adjustment = FMM award – E-Tag at RTD LMP	0 MW	N/A	0 MWh

*Decline charge only applies if FMM Undelivered Quantity exceeds 10% of total transactions

Summary: The scheduling coordinator notified the ISO in advance of the undeliverable energy. Although any undeliverable energy has adverse operational and market impacts, both the operator and the market are aware of the change and may have time to re-commit internal supply or intertie resources. The scheduling coordinator has 100 MW applied toward the decline charge threshold.

Example #2 – Day-ahead market import resource not tagged

Setup: A resource receives a 100 MW award in the day-ahead market. The scheduling coordinator does not bid into the real-time market, therefore, the award remains at 100 MW. The 100 MW award is *accepted* in the automated dispatch system, but no E-Tag is submitted.

	Interval 1	Interval 2	Interval 3	Interval 4
DA Award	100 MW	100 MW	100 MW	100 MW
HASP schedule	100 MW	100 MW	100 MW	100 MW
FMM award	100 MW	100 MW	0 MW	0 MW
E-Tag	0 MW	0 MW	0 MW	0 MW

Settlement: The fifteen-minute market undelivered quantity is 100 MW for the intervals 3 and 4. Therefore, 50 MWh will be applied towards the end-of-month summation to determine if the 10% threshold is exceeded and the decline charge should be applied. The operational adjustment is 100 MW for intervals 1 and 2 because the E-Tag does not match the total expected energy. This totals 50 MWh of operational adjustment at the real-time dispatch locational marginal price.¹⁸

Settlement	Quantity	Intervals	MWh
Instructed Imbalance Energy = DA – FMM award at FMM LMP	100 MW	3 – 4	50 MWh
FMM Undelivered Quantity (Decline Charge*) = HASP schedule – FMM award at 50% FMM LMP	100 MW	3 – 4	50 MWh
Operational Adjustment = FMM award – E-Tag at RTD LMP	100 MW	1 – 2	50 MWh

*Decline charge only applies if FMM Undelivered Quantity exceeds 10% of total transactions

Summary: The scheduling coordinator did not notify the ISO in advance of the undeliverable energy. Undelivered intertie resources are never beneficial for the ISO, but the failure to submit an E-Tag is even worse than declining an award by T-40. Neither the operator nor the market are aware of any shortage for the first two intervals of the operating hour. The scheduling coordinator has 50 MW applied toward the decline charge threshold. In comparison to Example #1, the MWh applied toward the decline charge is less even though the behavior of not tagging creates operational challenges for the ISO.

¹⁸ MW is the unit of instantaneous power at any given moment in time. MWh is a unit of energy, which is defined as power over a specified time – in this case an hour. MWh can be calculated by determining the power (MW) for each 15-minute interval. For example #2, 100 MW was generated for two 15-minute intervals and 0 MW was generated for two 15-minute intervals. Therefore, $100 \times (1/4) + 100 \times (1/4) + 0 \times (1/4) + 0 \times (1/4) = 50$ MWh.

Example #3 – Real-time market import resource declined

Setup: A resource receives no award in the day-ahead market. The scheduling coordinator bids into the real-time market and is awarded 100 MW. The 100 MW award is *declined* in the automated dispatch system.

	Interval 1	Interval 2	Interval 3	Interval 4
DA award	0 MW	0 MW	0 MW	0 MW
HASP schedule	100 MW	100 MW	100 MW	100 MW
FMM award	0 MW	0 MW	0 MW	0 MW
E-Tag	0 MW	0 MW	0 MW	0 MW

Settlement: The fifteen-minute market undelivered quantity is 100 MW for intervals 1 – 4. Therefore, 100 MWh will be applied towards the end-of-month summation to determine if the 10% threshold is exceeded and the decline charge should be applied. The operational adjustment is 0 MW for all intervals because the E-Tag matches the total expected energy.

Settlement	Quantity	Intervals	MWh
Instructed Imbalance Energy = DA – FMM award at FMM LMP	0 MW	N/A	0 MWh
FMM Undelivered Quantity (Decline Charge*) = HASP schedule – FMM award at 50% FMM LMP	100 MW	1 – 4	100 MWh
Operational Adjustment = FMM award – E-Tag at RTD LMP	0 MW	N/A	0 MWh

*Decline charge only applies if FMM Undelivered Quantity exceeds 10% of total transactions

Summary: The scheduling coordinator notified the ISO in advance of the undeliverable energy. The decline of an intertie award is never beneficial for the ISO, but in this case both the operator and the market are aware of the shortage in advance of the fifteen-minute market run. The scheduling coordinator has 100 MW applied toward the decline charge threshold. Declining an award has the same impact and settlement (with the exception of the hour-ahead scheduling process reversal rule) regardless if the award was from the day-ahead or real-time market.

Example #4 – Real-time market import resource not tagged

Setup: A resource receives no award in the day-ahead market. The scheduling coordinator bids into the real-time market and is awarded 100 MW. The 100 MW award is *accepted* in automated dispatch system, but no E-Tag is submitted.

	Interval 1	Interval 2	Interval 3	Interval 4
DA Award	0 MW	0 MW	0 MW	0 MW
HASP schedule	100 MW	100 MW	100 MW	100 MW
FMM award	100 MW	100 MW	0 MW	0 MW
E-Tag	0 MW	0 MW	0 MW	0 MW

Settlement: The fifteen-minute market undelivered quantity is 100 MW for intervals 3 – 4. Therefore, 50 MWh will be applied towards the end-of-month summation to determine if the 10% threshold is exceeded and the decline charge should be applied. The operational adjustment is 100 MW for intervals 1 -2 because the E-Tag does not match the total expected energy. This totals 50 MWh of operational adjustment at the real-time dispatch locational marginal price.

Settlement	Quantity	Intervals	MWh
Instructed Imbalance Energy = DA – FMM award at FMM LMP	100 MW	1 – 2	50 MWh
FMM Undelivered Quantity (Decline Charge*) = HASP schedule – FMM award at 50% FMM LMP	100 MW	3 – 4	50 MWh
Operational Adjustment = FMM award – E-Tag at RTD LMP	100 MW	1 – 2	50 MWh

*Decline charge only applies if FMM Undelivered Quantity exceeds 10% of total transactions

Summary: The scheduling coordinator did not notify the ISO in advance of the undeliverable energy. The decline of an intertie award is beneficial for the ISO, but by failing to submit an E-Tag neither the operator nor the market are aware of the change. However, in comparison to Example #3, the scheduling coordinator only has 50 MW applied toward the decline charge threshold. The scheduling coordinator has a smaller MW amount applied towards the decline charge even though the behavior of not tagging is less desirable than declining an award in advance of the fifteen-minute market run. Not submitting an E-Tag has the same impact and settlement (with the exception of the hour-ahead scheduling process reversal rule) regardless of the award was from the day-ahead or the real-time market.

Example #5 – Tag submitted for partial amount of award

Setup: A resource receives a 100 MW award in the day-ahead market. The scheduling coordinator bids into the real-time market and is awarded an additional 20 MW. The 120 MW award is *accepted* in automated dispatch system, but an E-Tag is submitted for only 80 MW.

	Interval 1	Interval 2	Interval 3	Interval 4
DA Award	100 MW	100 MW	100 MW	100 MW
HASP schedule	120 MW	120 MW	120 MW	120 MW
FMM award	120 MW	120 MW	80 MW	80 MW
E-Tag	80 MW	80 MW	80 MW	80 MW

Settlement: The fifteen-minute market undelivered quantity is 40 MW for intervals 3 – 4. Therefore, 20 MWh will be applied towards the end-of-month summation to determine if the 10% threshold is exceeded and the decline charge should be applied. The operational adjustment is 40 MW for intervals 1 - 2 because the E-Tag does not match the total expected energy. This totals 20 MWh of operational adjustment at the real-time dispatch locational marginal price.

Settlement	Quantity	Intervals	MWh
Instructed Imbalance Energy = DA – FMM award at FMM LMP	+20 MW	1 – 2	0 MWh
	-20 MW	3 – 4	
FMM Undelivered Quantity (Decline Charge*) = HASP schedule – FMM award at 50% FMM LMP	40 MW	3 – 4	20 MWh
Operational Adjustment = FMM award – E-Tag at RTD LMP	40 MW	1 – 2	20 MWh

*Decline charge only applies if FMM Undelivered Quantity exceeds 10% of total transactions

Summary: The scheduling coordinator did not notify the ISO in advance that a portion of the energy was undeliverable. This is not beneficial for the ISO; neither the operator nor the market are aware of the change. The scheduling coordinator has a smaller MW amount applied towards the decline charge even though the behavior of not tagging is less desirable than declining an award. Submission of an E-Tag that is only a portion of the accepted award still has operational and settlement impacts.

Example #6 – Tag curtailed for reliability reasons

Setup: A resource receives a 100 MW award in the day-ahead market. The scheduling coordinator bids into the real-time market and is awarded an additional 20 MW. The 120 MW award is *accepted* in the automated dispatch system, an E-Tag is submitted, but the E-Tag is curtailed to 80 MW for reliability reasons.

	Interval 1	Interval 2	Interval 3	Interval 4
DA Award	100 MW	100 MW	100 MW	100 MW
HASP schedule	120 MW	120 MW	120 MW	120 MW
FMM award	120 MW	120 MW	80 MW	80 MW
E-Tag	80 MW	80 MW	80 MW	80 MW

Settlement: The fifteen-minute market undelivered quantity is 40 MW for intervals 3 – 4. Therefore, 20 MWh will be applied towards the end-of-month summation to determine if the 10% threshold is exceeded and the decline charge should be applied. The operational adjustment is 40 MW for intervals 1 - 2 because the E-Tag does not match the total expected energy. This totals 20 MWh of operational adjustment at the real-time dispatch locational marginal price.

Settlement	Quantity	Intervals	MWh
Instructed Imbalance Energy = DA – FMM award at FMM LMP	+20 MW - 20 MW	1 – 2 3 – 4	0 MWh
FMM Undelivered Quantity (Decline Charge*) = HASP schedule – FMM award at 50% FMM LMP	40 MW	3 – 4	20 MWh
Operational Adjustment = FMM award – E-Tag at RTD LMP	40 MW	1 – 2	20 MWh

*Decline charge only applies if FMM Undelivered Quantity exceeds 10% of total transactions

Summary: The scheduling coordinator correctly accepted the market award and submitted an E-Tag. However, the E-Tag was curtailed for reliability reasons. In comparison to Example #5, this example has the same settlement implications. The scheduling coordinator is impacted and has 20 MWh applied towards the decline charge threshold even though the scheduling coordinator was not at fault.

Example #7 – Real-time market export resource partial accepted

Setup: An intertie resource bids into the real-time market as an export (exporting energy out of the CAISO balancing authority area) and is awarded 50 MW. The export resource partially accepts the award to 25 MW. The ISO net schedules intertie resources meaning the summation of import and export resources cannot exceed the scheduling limit. Therefore, an increase of an export enables additional import resources to be dispatched. Because the export resource only partially accepts the award but the import resources fully accept their awards, the ISO exceeds the scheduling limit and must pro-rata curtail all import resources.

	eTag	DA	HASP	Accepted DOT	Curtailed MW	Final eTag
Accepted incremental dispatch	Import_1	50	50	50	5	45
	Import_2	100	100	100	10	90
	Import_3	0	25	25	2	23
	Import_4	50	75	75	8	67
Partial accepted decremental dispatch	Export_1	0	(50)	(25)	0	(25)
	LIMIT	200	200	200	200	200
	TOTAL	200	200	225	25	200

Summary: In this scenario, the partially accepted export in combination with the fully accepted imports resulted in the intertie being net scheduled over its limit. The ISO always expects hour-ahead scheduling process awards to be accepted. Based on that assumption, the partially accepted export resource has caused the intertie to be over scheduled. This results in curtailments to all import resources – even import resources that were scheduled in the day-ahead market and have not made any bidding and/or tagging changes. The curtailment negatively impacts all import resources but does not negatively impact the export resource. The ISO requests stakeholder feed to discuss possible solutions to address this problem.

6. Data Analysis

This section includes data analysis to quantify the root cause of intertie declines and the magnitude of the decline charge in comparison to total deviations.

The ISO is in the process of completing analysis to compare declines to under-tagged intertie resources, as well as detailed analysis of the September 2017 heat wave. This analysis will be presented during the stakeholder meeting on October 15, 2018.

6.1 Root Cause for Intertie Declines

Many stakeholders requested root-cause analysis to determine why scheduling coordinators are either declining or not tagging intertie resources. When an hour-ahead scheduling process schedule is partially accepted or declined, the automated dispatch system requires the scheduling coordinator input a reason.

The scheduling coordinator can select one of the following options to decline an intertie award:

- Bad Bid Submitted
- Economic Consideration
- Line Down
- No Available Transmission
- Unit Derate

Data analysis has been completed and summarizes the reasons for intertie declines. This data summarizes declined and partially accepted awards, categorized by reason, from July 2017 – June 2018.

Figure 6: Declined imports and exports categorized by reason for July 2017 – June 2018.

Reason for Decline	% of Total Declines, Imports	% of Total Declines, Exports
Bad Bid Submitted	50.3%	53.76%
Economic Consideration	16.89%	44.96%
Line Down	4.45%	0.00%
No Available Transmission	16.68%	-0.61%
Unit Derate	8.60%	1.89%

For intertie imports and exports, the majority of declines occur due to “Bad Bid Submitted”. The intent of this option is to indicate that a bid was incorrectly submitted into the ISO market. However, based on the frequency with which this option is selected, it may also mean that although the bid has cleared, the scheduling coordinator is no longer satisfied with the clearing price of the bid. The reason the scheduling coordinator selects “Bad Bid Submitted” is subjective.

It is significant to note that “Bad Bid Submitted”, “Economic Considerations” and “No Available Transmission” are all within control of the scheduling coordinator. Only “Line Down” and “Unit Derate” indicate a forced outage is the reason for the decline – these are outside control of the scheduling coordinator. For import resources, only 13.05% of declines (4.45% due to “Line Down” + 8.60% due to “Unit Derate” = 13.05%) occur due to reasons beyond control of the scheduling coordinator. For export resources, only 1.89% of declines occur due to reasons beyond control of the scheduling coordinator.

The ISO has provided data regarding declined and partially accepted awards, but is unable to produce concrete data for the reason scheduling coordinators choose not to tag accepted awards. Scheduling coordinators may choose not to submit an E-Tag for a corresponding market award for many reasons that are unknown to the ISO.

Powerex has summarized why this may occur in their written comments in response to the *Intertie Deviation Settlement* issue paper.¹⁹ Powerex explains that scheduling coordinators may fail to tag and deliver award energy for three reasons: (1) energy cannot be delivered due to a forced outage, (2) energy is not delivered because seller elects to deliver the energy elsewhere, and (3) speculative energy supply was bid into the market but is not tied to a physical generator or transmission. These items are summarized in **Figure 7**: Powerex summary for intertie delivery failures.

The first item is completely beyond control of the scheduling coordinator. Forced outages are unpredictable and unavoidable – they also are not correlated to low supply conditions that may result in high prices in the ISO’s markets.

The second two items, however, are in control of the market participant. If prices are higher outside of the ISO, a seller can choose to deliver the energy elsewhere in hopes of economic gains or, a seller may not have physical generation available when bidding into the real-time market. If the bid clears at a favorable price, the seller will attempt to locate physical generation and transmission. If this cannot be complete, the seller likely faces no consequences as long as the 10% decline charge threshold has not been exceeded.

¹⁹ See Powerex written comments in response to the *Intertie Deviation Settlement* issue paper, page 5: <http://www.caiso.com/Documents/PowerexComments-IntertieDeviationsSettlement-IssuePaper.pdf>

Figure 7: Powerex summary for intertie delivery failures.

Category	Factors Driving Delivery Failure	Risk to CAISO (and EIM)
Physical supply, delivery according to final award	Forced outages or de-rates at source BAA; transmission curtailment	Risk generally not correlated to alternative supply conditions; comparable to risks for internal resources
Physical supply, but seller elects non-delivery to CAISO in order to sell in other markets	Risk that more attractive market opportunities exist outside CAISO	Risk is elevated during tight regional supply conditions; Consequences are also likely more severe , as CAISO faces fewer or more costly alternative supply options
Speculative energy supply (non-RA)	Risk that external supply is not available, or price makes physical delivery uneconomic for seller	

Source: Powerex comments on Intertie Deviation Settlement issue paper, page 5.

In summary, the ISO has determined intertie declines occur most commonly due to the submission of bad bids. The ISO is unable to explicitly state why under-tagging occurs but believes it is likely due to economic reasons or because the seller is unable to purchase generation at a favorable price. The ISO plans to address intertie declines and under-tagging with the new under/over delivery charge that is explained in [Section 7](#).

6.2 Decline Charge Settlement Data

The decline charge is calculated by summing the total fifteen-minute market undelivered quantity (in MWh) over the course of a month. If the total exceeds 10% of total transactions (in the import and export direction individually) the decline charge applies. The price applied is the maximum of \$10.00 or 50% of the fifteen-minute market locational marginal price for each MWh that exceeds the threshold.

The data below summarizes the total decline charge applied to all scheduling coordinators from July 2017 - June 2018 by month in the import and export direction.

- **Decline Charge (\$)** is the total charge applied to all scheduling coordinators in the import and export direction respectively for a given month
- **Potential Decline Charge (\$)** is the total cost of the decline charge if it were applied by interval and without a threshold
- **Declined Quantity (MWh)** is the total amount of undelivered intertie resources including declined, under-tagged, and curtailed resources for all scheduling coordinators in the import and export direction respectively for a given month

Figure 8 and Figure 9: Total applied decline charge (\$) due to undelivered imports for all scheduling coordinators for January 2017 – June 2018 by month.

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

Import Decline Charge Cost vs. Quantity

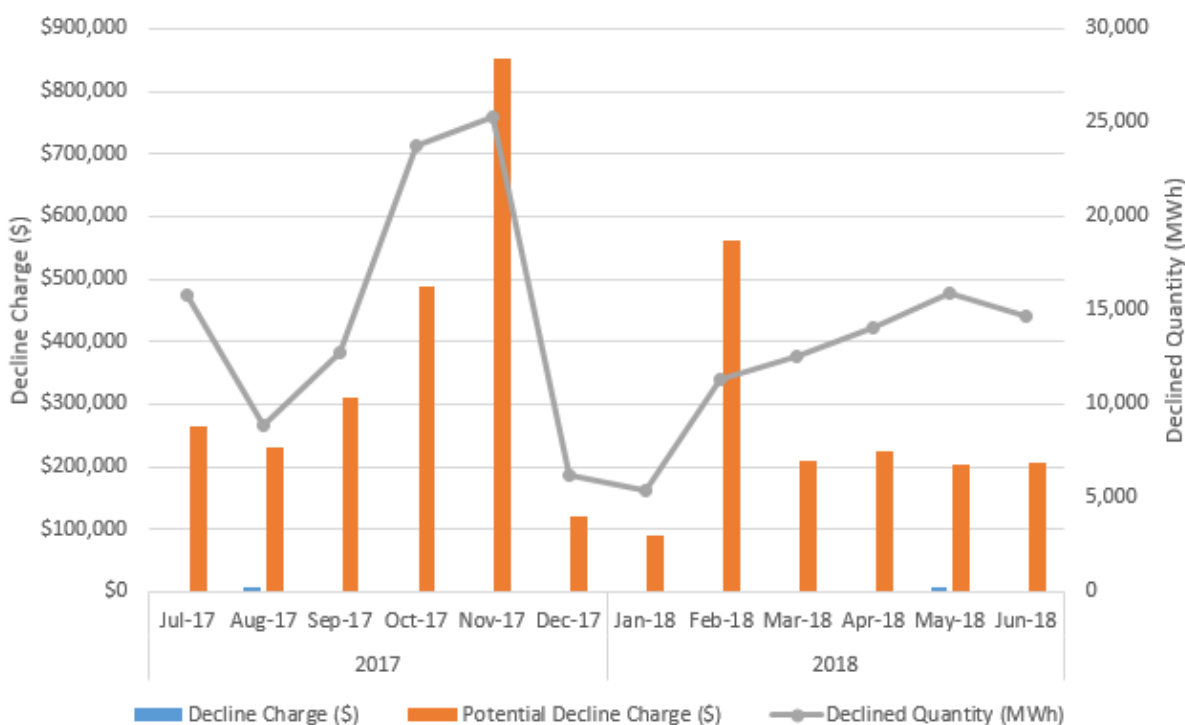
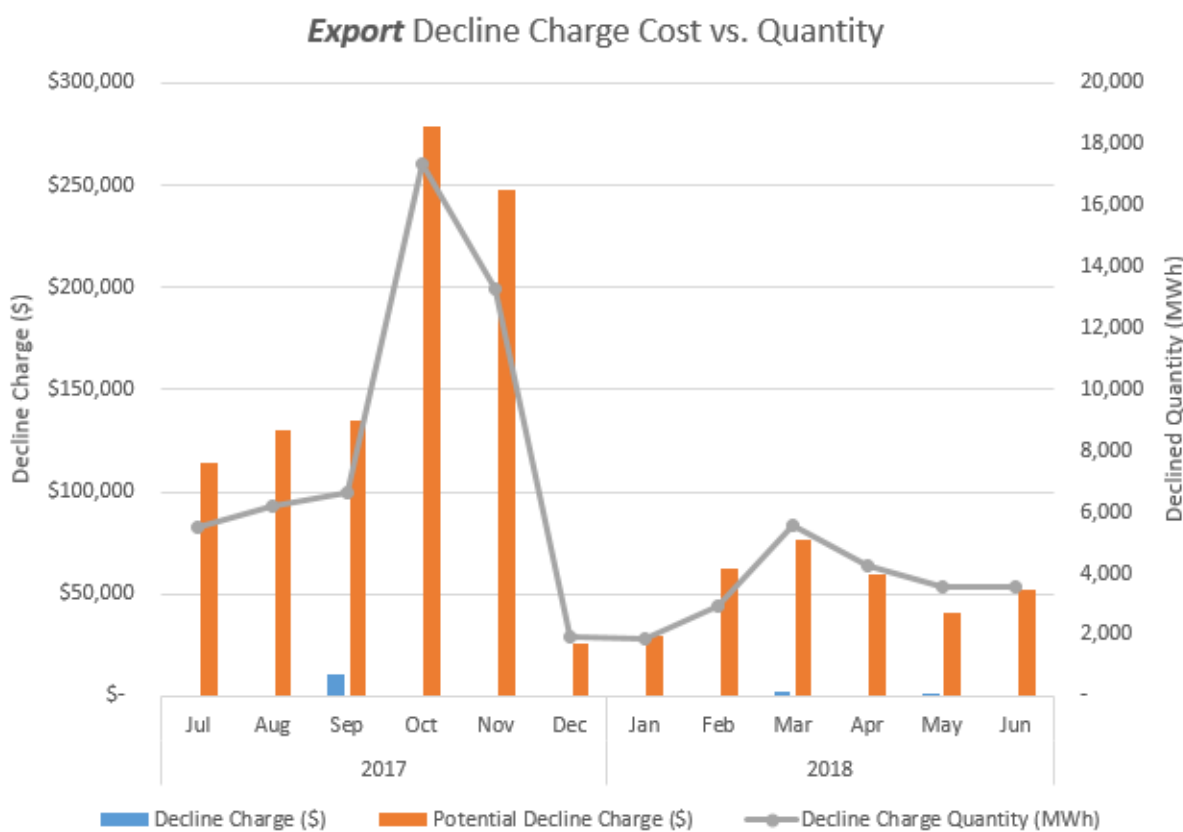


Figure 10 and Figure 11: Total applied decline charge (\$) due to undelivered exports for all scheduling coordinators for January 2017 – June 2018 by month.

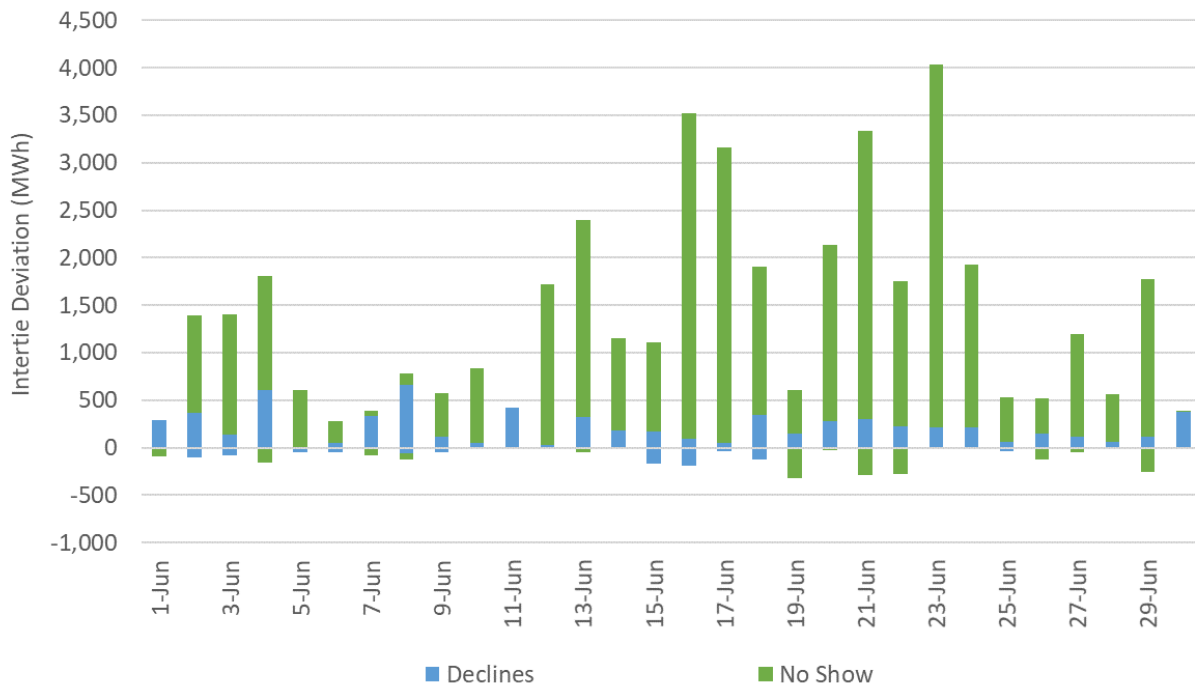
EXPORTS Date	Decline Charge (\$)	Decline Charge as % of Potential	Potential Decline Charge (\$)	Decline Charge Quantity (MWh)
2017	\$ 10,809	1.16%	\$ 930,630	50,901
Jul	\$ -	0.00%	\$ 113,811	5,507
Aug	\$ -	0.00%	\$ 130,402	6,182
Sep	\$ 10,809	8.03%	\$ 134,579	6,662
Oct	\$ -	0.00%	\$ 279,018	17,340
Nov	\$ -	0.00%	\$ 247,447	13,286
Dec	\$ -	0.00%	\$ 25,372	1,925
2018	\$ 2,995	0.93%	\$ 321,397	21,785
Jan	\$ -	0.00%	\$ 29,706	1,900
Feb	\$ -	0.00%	\$ 62,521	2,945
Mar	\$ 2,225	2.90%	\$ 76,742	5,566
Apr	\$ -	0.00%	\$ 59,528	4,268
May	\$ 770	1.89%	\$ 40,796	3,547
Jun	\$ -	0.00%	\$ 52,105	3,558
Grand Total	\$ 13,804	1.10%	\$ 1,252,026	72,687



6.3 Frequency of Declines and Under-Tagging of Intertie Resources

As a representative pattern **Figure 12** shows the volume of under-delivered intertie resources. The majority of undelivered intertie resources are due to no E-Tag (or under-tagging) as opposed to a decline in the automated dispatch system by T-40.

Figure 12: Undelivered interties (Declines and no E-Tag) for a representative month of June 2018.



In **Figure 12**, the green bars are the total MWh of non-delivered intertie awards due to no E-Tag (“No Show”). The blue bars are the total MWh of non-delivered intertie awards due to a decline (or partially accepted award). The data shows the majority of awarded but undelivered energy occurs because the scheduling coordinator fails to submit an E-Tag on time rather than decline the award prior to T-40 in automated dispatch system. Failure to submit an E-Tag results in decreased situational awareness and leaves market resolution to the 5-minute real-time dispatch.

The ISO is the process of completing additional analysis for July 2017 – June 2018 and will include a deep dive of the heat wave that occurred on September 1-2, 2017. This analysis will be presented during the stakeholder meeting on October 15, 2018.

7. Under/Over Delivery Charge Proposal

The purpose of the decline charge is to incentivize delivery of awarded energy. The existing framework of the decline charge is not effective because (1) the monthly threshold is too high, (2) the charge does not apply to 15-minute resources, (3) the charge does not account towards import resources that decline a decremental dispatch between the day-ahead and real-time market (or export resources that decline an incremental dispatch) between the-ahead and real-time market.

The ISO speculates that under the existing policy, scheduling coordinators can elect to deliver to the ISO when pricing is adequate. However, if pricing is higher in other balancing authority areas the scheduling coordinator can short the ISO by recognizing potential gains from the other entity will outweigh an operational adjustment charges and the decline charge will likely not apply. This results in the potential for the ISO to be short energy at times when the energy is needed most.

If a scheduling coordinator is subject to the existing decline charge (total deviations exceed 10% of total transactions for the month), the scheduling coordinator is charged at 50% of the fifteen-minute market locational marginal price per MWh. The fifteen-minute market price, however, does not accurately reflect that the energy was undelivered. By the time the deviation occurs, the fifteen-minute market is not necessarily able to dispatch additional energy on the interties. Therefore, the real-time dispatch is used to address the shortage. This may result in an unnecessary increase in the real-time market price because the market had to clear at a higher bid than it would have if the intertie had been delivered.

The ISO proposes to eliminate the decline charge and replace it with a new settlement mechanism henceforth known as the under/over delivery charge. This proposal applies to all import and export intertie resources, excluding dynamic intertie resources. Explicitly, the proposed under/over delivery charge will apply to intertie resources awarded in the:

- Day-ahead market
- Hour-ahead scheduling process
- Incremental and decremental changes between the day-ahead market and hour-ahead scheduling process
- Fifteen-minute market

The objective of this initiative is to decrease the number of undelivered intertie resources that occur due to declines and under-tagging. Therefore, the purpose of the new charge is to incentivize acceptance and delivery of market awards – if an award is either declined or not tagged, the market participant will be charged based on the price implications to the real-time market. The ISO proposes the framework summarized in the subsections below for the under/over delivery charge.

7.1 Determination of Fifteen-Minute Binding Awards and E-Tagging Requirement for Hourly Block Resources

The fifteen-minute market binding award for hourly block inertie resources is currently equal to the hour-ahead scheduling process award accepted in the automated dispatch system (under typical circumstances). This is problematic because the fifteen-minute market assumes a tag will be submitted to match the market award, but there is no guarantee of the tag submission.

If a scheduling coordinator fails to submit an E-Tag, it is too late for the hour-ahead scheduling process to schedule additional energy. In this situation, the ISO is not only short energy (or in an energy surplus if an export is not tagged), but the ISO has also reserved transmission capacity for that resource which will go unused. Untagged energy can result in the fifteen-minute market prices being lower than they should have been, and real-time dispatch prices higher than they should have been. The FMM should have cleared at a lower price if the awarded energy was not going to be delivered (market would have cleared lower on the bid stack). Replacing the energy results in a price increase in the real-time market. If the real-time market is unable to replace the energy, the ISO may experience reliability problems.

Therefore, instead of assuming the accepted award will be delivered, the ISO proposes to determine the fifteen-minute binding award for hourly blocked resources based on the E-Tag at T-40. The fifteen minute market binding award will equal the lower of the HASP schedule, HASP accepted award (ADS accepted value), or E-Tag transmission profile.

For example: if an hourly blocked schedule is accepted in the automated dispatch system but no E-Tag is submitted in advance of the fifteen-minute market run, the binding award will equal 0 MW. Contrarily, if an E-Tag is submitted but is greater than the market award, the fifteen-minute market binding award will still equal the HASP schedule.

If there is no E-Tag at T-40, it is too late for the ISO to schedule additional energy in the hour-ahead scheduling process. For that reason, the ISO proposes to introduce a real-time tagging requirement of T-40 for hourly block resources. This will ensure when the fifteen-minute market runs that it has an accurate estimation of the energy that will, or will not, be delivered.

This logic aligns with the fifteen-minute dispatchable inertie resources which are required to submit an E-Tag with a transmission profile prior to the fifteen-minute market run.²⁰ If no E-Tag is submitted, the resource does not receive a binding award. Going forward, the ISO proposes to make binding award determinations for all imports and exports based on the submission of an E-Tag as opposed to the assumption that a tag will be submitted to match the market award. This allows the fifteen-minute

²⁰ The Business Practice Manual for Market Operations (section 8.5.2) and the ISO Tariff (section 30.6.2.5) currently say fifteen-minute dispatchable resources must have an E-Tag submitted by T-37.5. The ISO proposes to change this to T-40. The market needs time to receive and process the E-Tag information so it can be used in the market run, which begins at exactly T-37.5.

market to schedule resources according to what is tagged, as opposed to what we assume will be tagged.

The enhanced fifteen-minute market logic also encourages scheduling coordinators to have physical generation and transmission procured when a bid is submitted. Assuming a bid clears, the ISO expects the energy to be delivered. If a scheduling coordinator is unable to tag the energy prior to the market run, the ISO market will no longer assume this energy will be delivered. This logic also ensures intertie schedules that are counted toward the resource sufficiency test have tagged and available transmission and a supply source.

7.2 Exclusion of Curtailments

When the decline charge was originally developed, the ISO had no way to distinguish between operator reliability curtailments and scheduling coordinator under (or over) tagging. The existing decline charge compares the hour-ahead scheduling process award to the final E-Tag energy profile – there is no specific distinction between when an operator curtailed E-Tag and a scheduling coordinator adjusted E-Tag.

For purposes of discussion, the ISO will use the following language to distinguish between an operator and a scheduling coordinator adjustment:

Adjustment. A change to an E-Tag's energy profile that is submitted by the scheduling coordinator. When an E-Tag differs from a market award due to an adjustment, the scheduling coordinator is responsible for the difference between the tag and the award.

Curtailment. A change to an E-Tag's energy profile that is submitted by a balancing authority area operator for a reliability reason. When an E-Tag differs from a market award due to a curtailment, the balancing authority area operator is responsible for the difference between the tag and the award. A curtailment can be completed by the ISO balancing authority operator, or balancing authority operator from another region but must be done for reliability reasons.

The ISO now has the ability to distinguish between curtailments and adjustments. Therefore, the ISO proposes to exclude a balancing authority operator curtailments from the under/over delivery charge. Consistent with the settlement structure used today, curtailments will continue to be settled for imbalance energy.

7.3 Eliminate 10% Threshold

The existing decline charge only applies if the total untagged and declined MWh over the course of a month exceeds the 10% of total import or exports (calculated separately). For example: assume a scheduling coordinator has 10,000 MWh of import transactions in a month. The scheduling coordinator

can have 1,000 MWh of declined (or under-tagged) intertie awards in the month without receiving a charge. As a result of this policy, the scheduling coordinator can manage when to deliver, and when not to deliver, with no decline charge as long as the total does not exceed 1,000 MWh.

The 10% threshold policy was put in place specifically to address balancing authority area operator curtailments out of the scheduling coordinator's control. Because the ISO could not distinguish between the two, the 10% threshold was put in place to account for curtailments. Now, however, the ISO *can* distinguish between curtailments and adjustments. Therefore, the 10% threshold is no longer necessary.

The ISO proposes to eliminate the 10% threshold and instead apply the under/over delivery charge on a 15-minute interval basis. As explained in [Section 7.2](#), curtailments will be excluded from the under/over delivery charge.

7.4 Determination of Under/Over Delivery Quantity

The ISO's existing decline charge compares the hour-ahead scheduling process award to the fifteen-minute binding award and applies only to hourly block resources.

In order to address both declines and tagging deviations for all intertie resources, the ISO proposes to calculate the under/over delivery quantity by comparing the reference schedule to the E-Tag. The reference schedule equals the HASP schedule for hourly block resources and the FMM schedule for fifteen-minute resources. The under/over delivery quantity will equal the absolute value of the difference between the reference schedule and the after the fact E-Tag energy profile. This is summarized in **Figure 13**. This logic, in conjunction with the new fifteen-minute binding award determination logic, will incentivize awards to be accepted and awards to be tagged.

Figure 13: Proposed reference level and determination of under/over delivery quantity for intertie bid options.

Bid Option	Determination of Under/Over Delivery Quantity
Self-Schedule Hourly Block	Absolute Value (HASP Schedule – after the fact E-Tag Energy Profile)
Economic Hourly Block	
Economic Hourly Block with Intra-Hour Option (once-change) ²¹	Absolute Value (FMM Schedule – after the fact E-Tag Energy Profile)
Economic (fifteen-minute dispatchable)	
Economic Variable Energy Resource	
Dynamic	Excluded from under/over delivery charge

²¹ The ISO is proposing to remove the economic hourly block with intra-hour option in the *Day-Ahead Market Enhancements (DAME)* initiative. This bid type is not used by scheduling coordinators and therefore will be removed with the DAME phase 1 implementation in Fall 2020.

Examples of the existing functionality in comparison to the proposed functionality can be found in the attached *Intertie Deviation Settlement Worksheet*. The worksheet provides detailed settlement information (for informational purposes only) to explain the difference between the decline charge and the proposed under/over delivery charge for both hourly block and fifteen-minute resources.

7.5 Under and Over Tagging

The ISO proposes to apply the charge to both under and over tagging. Currently, the decline charge only applies to under-tagged imports, or under-tagged exports. Over-tagged imports and exports are addressed through the ISO's business practices. The business practice manual and operating procedures explain the scheduling coordinator is responsible for adjusting E-Tags to match market awards. However, if an E-Tag is not adjusted by the scheduling coordinator and the tag exceeds the market award, the ISO operator will curtail the E-Tag so the energy profile matches the market award. When the ISO operator curtails in these scenarios, the curtailment is not completed for reliability reasons.

Based on today's logic, an import resource with a day-ahead market award and a decremental bid in the hour-ahead scheduling process can decline the decremental award without having the MWh count towards the decline charge threshold.²² For example, an import resource with a 100 MW award in the day-ahead market can bid into the hour-ahead scheduling process to decrement the award down to 50 MW. If the bid clears, the scheduling coordinators can accept a schedule anywhere between 50 MW and 100 MW. The difference between the HASP schedule of 50 MW and the accepted schedule of 100 MW (declining the decremental dispatch) will not count towards the decline charge threshold. By applying the under/over delivery charge to resources with E-Tags that are under *or* over-scheduled, this gap will be addressed.

Additionally, the ISO operator will no longer be required to make non-reliability related curtailment. The adjustment responsibility will fall upon the scheduling coordinator. If the E-Tag exceeds the market award, the ISO will allow it to flow as long as it does not cause any reliability problems (such as the over-scheduling of an intertie). While the ISO maintains it is the responsibility of the scheduling coordinator to submit E-Tags that match ISO market awards, the proposed under/over delivery charge ensures equal treatment of under and over-tagged schedules. If an individual E-Tag exceeds the market award and *does* result in the over-scheduling of an intertie, the ISO operator will have the ability to adjust the individual E-Tag's energy profile down to the market award. By adjusting the tag as opposed to curtailing the tag, the intertie resources will be subject to the under/over scheduling charge. See [section 7.2](#) regarding the difference between curtailments and adjustments.

Going forward, ISO operator curtailments will occur for reliability reasons including but not limited to the over-scheduling of an intertie, a forced generator or transmission outage, or unscheduled flow mitigation.

²² Conversely, the same applies for export resources.

7.6 Allocation and Price of Under/Over Delivery Charge

The penalty funds collected will be allocated to measured demand less existing transmission contracts (ETCs) and transmission operating rights (TORs). This allocation is consistent with the existing decline charge but will be changed from monthly to each interval. For additional information on the allocation, reference the Intertie Schedules Decline Charges Allocation: CC 6457 (see [References](#)).

In order for the price of the charge to be comparable to the impact the decline had on the market, the ISO believes it is appropriate that the under/over delivery charge is equal to 50% of the real-time dispatch locational marginal price. The real-time market will reflect the impact the intertie deviation had on the real time market.

The ISO proposes for the charge to be applied for each interval in which an under/over delivery quantity is calculated. The ISO believes this proposal will charge the scheduling coordinator at a price dependent on the harm inflicted on the ISO market. Said differently, the charge is comparable to the impact the deviation had on the market. By eliminating the 10% threshold and applying the charge for each interval, the scheduling coordinator has incentive to deliver energy, especially when the ISO needs the energy the most.

For example: Assume the fifteen-minute market clears at \$250/MWh. A scheduling coordinator was awarded 100 MW but did not submit an E-Tag to match the market award. It is too late for the fifteen-minute market to schedule additional energy; instead, the real-time dispatch will dispatch additional energy. Let's assume this resulted in the real-time market price increasing to \$275. Therefore, in addition to any applicable imbalance energy settlement, the scheduling coordinator will be charged 50% of \$275 for the 100 MWh that was not delivered, reflecting these other impacts to operations and the market.

The intent of the under/over delivery charge is to incentivize market participants to accept their hour-ahead scheduling process award and deliver the award energy. If deviations occur, the charge is applied. However, based on the logic described above, scheduling coordinators would be paid for deviations if pricing is negative. This would potentially incentivize deviations when pricing is negative – payment for deviations would contradict the purpose of the under/over delivery charge. Therefore, the ISO proposes a floor of \$0 for the under/over delivery charge. If pricing is negative, the under/over delivery charge will not apply.

7.7 Decline Resulting in Over-Scheduled Intertie

As shown in [Example 7](#), there are scenarios when over scheduling in the import direction occurs due to an export resource declining or partially accepting an award in the hour-ahead scheduling process.²³ When this occurs, the ISO is responsible to curtail all import resources based on their contribution to the over-schedule (also known as a *pro rata* curtailment). In reality, the import resources have accepted their awards and submitted valid E-Tags to match their awards – they are not at fault for the over-schedule but are curtailed anyway. Although the curtailment allows the imports to be excluded from the under/over delivery charge, they are unable to deliver the fully awarded schedule and are subject to imbalance energy settlement. The export resource is not affected at all. The ISO believes the proposed under/over delivery charge will address this problem.

The ISO also proposes a change to the curtailment rules to address this situation. The ISO proposes that in the case an export resource bids into the hour-ahead scheduling process and partially accepts or declines an award which results in the over-scheduling of an intertie in the import direction, the ISO proposes that,

if the scheduling coordinator with a partially accepted (or declined) export has import schedules at the same intertie, the ISO operator will manually adjust the import schedule to accommodate the partially accepted (or declined) export schedule.

The ISO proposes that in the case an import resource bids into the hour-ahead scheduling process and partially accepts or declines an award which results in the over-scheduling of an intertie in the export direction, the ISO proposes that,

if the scheduling coordinator with the partially accepted (or declined) import has export schedules at the same intertie, the ISO grid operator will manually adjust the export schedule to accommodate the partially accepted (or declined) import schedule.

The scheduling coordinator would also be subject to applicable under/over delivery charges and imbalance energy settlements for the partially accepted or declined export. Additionally, the manually adjusted import schedule would also be subject to the under/over delivery charge and imbalance energy settlements. This should incentivize acceptance of awards when bids clear the hour-ahead scheduling process.

²³ The ISO balancing authority area is typically a net importer. For that reason, this paper and resulting discussion is based on an export resource partially accepting or declining award (as shown in Example 7). Please note the inverse can occur as well: the over-scheduling of an intertie in the export direction can occur due to a partially accepted or declined import resource.

8. Additional Items

8.1 Response to Stakeholder Comments

The ISO addressed stakeholder comments on the issue paper throughout this straw proposal.²⁴ Comments that were not addressed above are included in this section.

Resource Adequacy on the Interties

Resource adequacy bidding and scheduling on the interties is outside the scope of this initiative and will be addressed in the *RA Enhancements* initiative. Additional information can be found on the RA Enhancements webpage at:

<http://www.caiso.com/informed/Pages/StakeholderProcesses/ResourceAdequacyEnhancements.aspx>

Market Timelines

Moving the ISO fifteen-minute market timeline closer to the NAESB E-Tagging timeline of T-20 is out of the scope of this initiative. This initiative intends to address undelivered intertie resources and does not propose changes to the market timing.

ISO Operating Procedures

ISO operating procedures and business practice manuals specifically explain that scheduling coordinators must submit E-Tags for accepted market awards. This responsibility to tag market awards falls solely on the scheduling coordinator. The job of the ISO operator is to reliably manage operation of the bulk electric grid – the ISO operator will not, and should not, individually call scheduling coordinators to explain financial impacts of not submitting E-Tags. The ISO balancing authority area operator is *not* a marketer and therefore will never discuss market pricing unless necessitated for reliability reasons (i.e. exceptional dispatches). Market pricing is published on OASIS, market awards are published in CMRI and ADS, bids are accessible in SIBR. This information is all accessible to the scheduling coordinator.

²⁴ Stakeholder comments can be found at www.caiso.com under the Stakeholder Processes → Intertie Deviation Settlement initiative webpage. Please reference comments in response to the Issue Paper. <http://www.caiso.com/informed/Pages/StakeholderProcesses/IntertieDeviationSettlement.aspx>

Reference ISO Operating Procedure 2510: NERC Tagging Requirements.²⁵

ISO System Operator responsibility: The ISO validate Interchange transactions and confirms them with adjacent Balancing Authorities (BA) prior to implementing them in the ACE equation. Additionally, the ISO assesses Interchange transaction for reliability purposes, adequacy of transmission rights, and ensures market awards are not exceeded prior to E-Tag implementation. The ISO uses the Interchange transaction scheduler (ITS) software to process NERC E-Tags, and when necessary, curtail E-Tags that do not pass validation or meet requirements. The ISO complies with NERC/NAESB and WECC business practices related to interchange and implements Confirmed Interchange as received from the Interchange Authority.

Scheduling Coordinator (SC) responsibility: SCs are entities certified by the ISO for the purposes of undertaking functions specified in the CAISO Tariff. This includes ensuring Interchange Schedules are prepared in accordance with NERC, WECC, and ISO requirements and providing E-Tags for all applicable transactions. However, SC's are not specifically identified in NERC/NAESB and WECC standards and might not meet the strict definition of a Purchasing Selling Entity (PSE) as defined in the NERC Glossary of Terms. As such, the SC is responsible for ensuring their transactions are properly tagged by a PSE, as SCs must be awarded ISO market bids and self-schedules on all tags for validation purposes. Failure to satisfy these ISO/ENRV/NAESB tagging requirements may result in refusal by the ISO to implement the Interchange Schedule, irrespective of ISO Market Awards.

Uninstructed Deviation Penalty

The ISO plans to apply the proposed under/over delivery charge to non-dynamic intertie resources. Internal generators and dynamic intertie resources will be excluded from the policy. Application of a deviation charge to internal generation is commonly known as an *uninstructed deviation penalty* (UDP) and is used in some energy markets. At this time, consideration of an UDP for CAISO internal generators is out of the scope of this initiative.

The CAISO believes it is appropriate that internal and external generation is settled differently because they are treated differently by the market. Internal generators are unit specific and are metered. Deviation between the generator dispatch and actual output is settled as uninstructed imbalance energy (UIE) but is not additionally penalized. Intertie resource (external supply) do not need to be unit specific and therefore are not necessarily metered at the generator level. This is an important distinction because the ISO markets have confirmation that internal generators are tied to physical resource whereas intertie resources may not be tied to physical supply. For that reason, the ISO needs an

²⁵ Reference the ISO's operating procedures related to interchange management – OP series 2500. <http://www.caiso.com/rules/Pages/OperatingProcedures/Default.aspx>

incentive to encourage delivery of external resources because there is no guarantee that a physical generator is backing the bid.

Another important distinction is the frequency with which internal and external generation can be dispatched. Internal generators can be dispatched every five minutes and inject directly into the ISO grid. If an internal generator is not following its dispatch, another internal generator can be dispatched in the next five-minute interval with direct injection to the grid. This process accounts for transmission congestion. In comparison, intertie resources are dispatched either hourly or every fifteen-minutes and require the procurement of transmission to allow the import or export transaction to take place. When an hourly blocked intertie resource fails to deliver, the transmission goes unused and because transmission is an hourly commodity there is no opportunity to schedule additional energy on the interties. For this reason, it is important to incentive delivery of intertie resources as awarded by the ISO market.

8.2 Open Items from Issue Paper

The *Intertie Deviation Settlement* issue paper – published on August 15 – requested stakeholder input regarding the ISO’s curtailment practice and the granularity with which the ISO receives E-Tag information.

- Should the ISO’s curtailment practice move from hourly to 15-minute granularity? Would 15-minute curtailments impact hourly blocked resources?
- Does the ISO need to receive 15-minute integrated E-Tag information instead of hourly integrated E-Tag information?

After further consideration, the ISO has determined both items are more appropriate for the Day Ahead Market Enhancements (DAME) Phase 1 initiative. DAME Phase 1 proposes 15-minute scheduling and bidding granularity in the day-ahead market. This creates alignment from the day-ahead to the real-time market. DAME Phase 1 considers many changes that are required for 15-minute scheduling; both of the items listed above will be included in the DAME Phase 1 draft final proposal, which will be published during the first quarter of 2019.

9. Stakeholder Engagement and Next Steps

Stakeholder input is critical for developing market design policy. The schedule proposed below allows several opportunities for stakeholder's involvement and feedback. At this time, management will only seek policy approval from the ISO Board of Governors. The EIM Governing Body may choose to provide advice on the policy to the Board of Governors.

9.1 Schedule

Figure 14 lists the planned schedule for the *Intertie Deviation Settlement* stakeholder process. The ISO proposes to present its proposal to EIM Governing Body and the ISO Board of Governors at the respective March 2019 meetings.

Figure 14 : Proposed schedule for the Intertie Deviation Settlement stakeholder process

Item	Date
Post Issue Paper	August 15, 2018
Stakeholder Conference Call	August 22, 2018
Stakeholder Comments Due	September 5, 2018
Post Straw Proposal	October 8, 2018
Stakeholder Meeting	October 15, 2018
Stakeholder Comments Due	October 29, 2018
Stakeholder Working Group Meeting	December 10, 2018
Stakeholder Comments Due	December 19, 2018
Post Draft Final Proposal	January 15, 2019
Stakeholder Conference Call	January 22, 2019
Stakeholder Comments Due	January 29, 2019
EIM Governing Body Meeting	March 12, 2019
Board of Governors Meeting	March 27 – 28, 2019

The ISO will discuss this paper during a stakeholder meeting on October 15, 2018. The ISO requests that stakeholders submit written comments by October 29, 2018 to InitiativeComments@caiso.com.

9.2 EIM Governing Body Role

The EIM Governing Body has an advisory role over policies that impact the real-time market. This policy impacts the real-time market and therefore the EIM Governing Body “has the right to submit to the Board its advice on” the issue. Please note that the policy changes will be directed only toward settlement rules for intertie bidding for the ISO balancing authority area. The energy imbalance market design does not include intertie bidding and is not subject to the decline charge.

This EIM classification is temporary and may change at any time during the stakeholder process. If any stakeholder disagrees with the ISO’s initial classification, please include in your written comments a justification of which classification is more appropriate.

Appendix A: Charge Code 6455 Example

Hourly Block Example - Charge Code 6455

	Int 1	Int 2	Int 3	Int 4	Hrly Total
DA Sched	100	100	100	100	400
FMM OE	25	25	22.5	22.5	95
Deemed Delivered (Meter)	122.5	122.5	122.5	122.5	490
OA = Meter - DA - FMM OE	-2.5	-2.5	0	0	-5
Hrly HASP Advisory	125	125	125	125	500
FMM Transmission etag (T-20 minutes)	122.5	122.5	122.5	122.5	490
FMM Accept Schedule (ADS)	125	125	122.5	122.5	495
FMM LMP	\$ 25.00	\$ 30.00	\$ 20.00	\$ 15.00	
Binding Energy:					
IMPORT = min(ADS, etag)					
EXPORT = max(ADS, etag)	122.5	122.5	122.5	122.5	490
Expected Flow:					
Hrly HASP Advisory	125	125	125	125	500
Neg OA:					
IMPORT = min(0, OA)					
EXPORT = max(0, OA)	-2.5	-2.5	0	0	-5
Deviation Energy:					
Binding Energy - (Expected Flow + Neg OA)	0	0	-2.5	-2.5	-5
Undelivered Energy/Decline Quantity (basis for BQ):					
IMPORT = min(0, Deviation Energy)*(-1)					
EXPORT = max(0, Deviation Energy)	0	0	2.5	2.5	5
Decline Charge Price:					
max (\$10, FMM LMP * 50%)	\$ 12.50	\$ 15.00	\$ 10.00	\$ 10.00	
Potential Decline Charge =					
Undelivered Energy * Decline Charge Price	\$ -	\$ -	\$ 25.00	\$ 25.00	\$ 50.00
Total Hourly HASP Dispatch:					
Abs(Expected Flow + Neg OA)	122.5	122.5	125	125	495
Total HASP Dispatch MTD					600
Total Monthly HASP Dispatch					1095

Threshold Quantity: max(300 MW, Total Monthly HASP Dispatch * 10%)		300
Total Undelivered Energy MTD		400
Total Monthly Undelivered Energy		405
Ratio: max (0, (Total Monthly Undelivered Energy - Threshold Quantity)) / Total Monthly Undelivered Energy		0.25925926
Potential Decline Charge MTD		\$ 500.00
Total Monthly Potential Decline Charge		\$ 550.00
Intertie Schedules Decline Charge - CC 6455: Total Monthly Potential Decline Charge * Ratio		\$ 142.59