



California ISO

Intertie Deviation Settlement: Issue Paper

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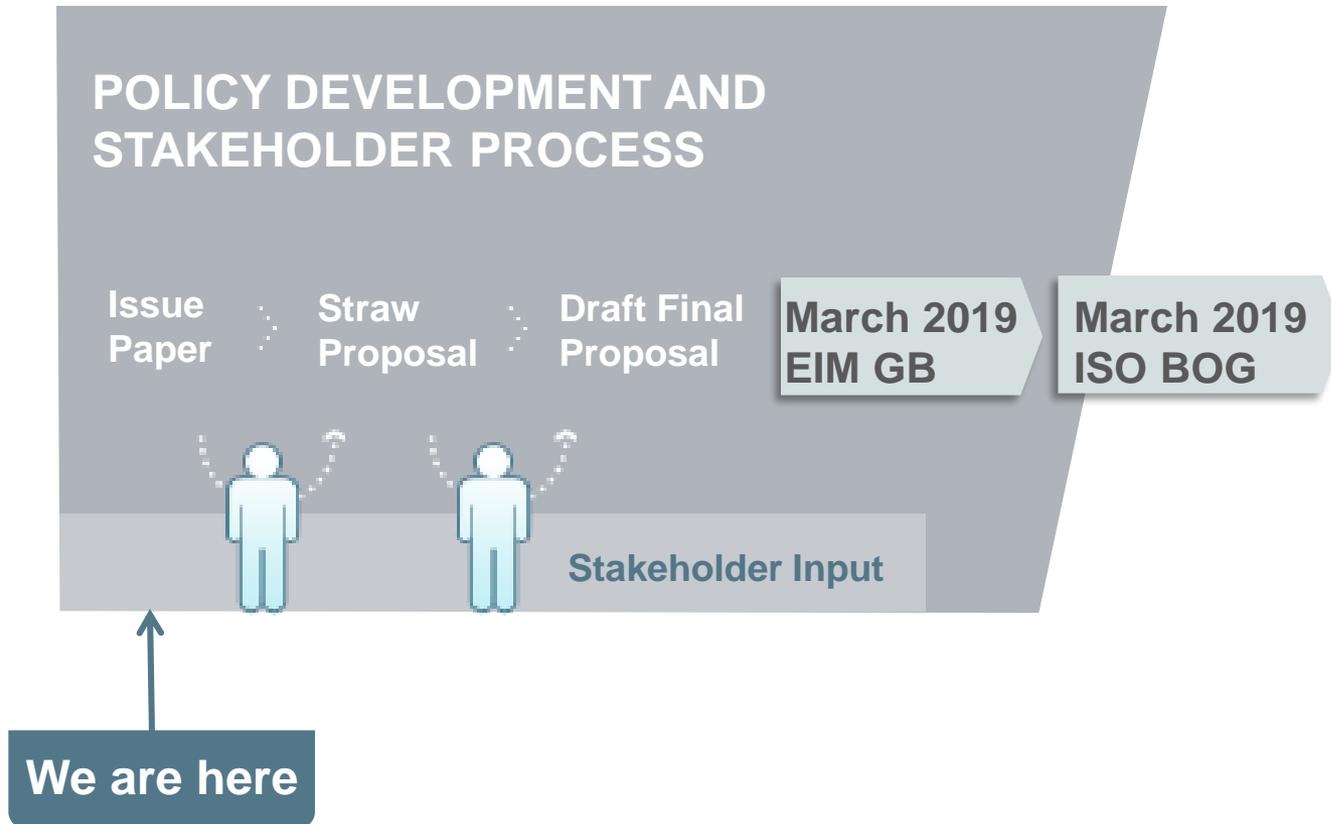
August 22, 2018

ISO PUBLIC

Agenda

Time	Topic	Presenter
10:00 – 10:10	Welcome	Jody Cross
10:10 – 10:30	Background – Intertie E-Tagging	Megan Poage
10:30 – 11:00	Existing Decline Charge	Megan Poage
11:00 – 11:40	Data & Examples	Megan Poage
11:40 – 11:50	Open Items	Megan Poage
11:50 – Noon	Next Steps	Jody Cross

ISO Policy Initiative Stakeholder Process



Intertie Deviation Settlement

BACKGROUND: INTERTIE E-TAGGING

Purpose of this initiative is to incentivize delivery of awarded energy on interties

- Intertie resources that do not meet their cleared market schedules cause impacts on market pricing and grid stability
- The ISO has recognized high levels of undelivered intertie resources
- This initiative will analyze the existing Decline Charge and ultimately propose a new settlement methodology for intertie deviations

Scheduling coordinators can elect one of several bid options for inertie resources

- Self-scheduled hourly block
- Economic hourly block
- Economic hourly block with intra-change option
- Economic fifteen-minute dispatchable
- Economic variable energy resource

The hour-ahead scheduling process (HASP) uses day-ahead market results and bids to determine schedules

- HASP schedules are published at the top of the operating hour
- Scheduling coordinators have 5-minutes to accept awards in the automated dispatch system (ADS)
- If no action is taken, ADS will automatically accepted the award on behalf of the scheduling coordinator

Intertie awards are accepted in the ADS (1 of 2)

Term	Settlement Definition
ADS Accept	Market award fully accepted in the ADS
ADS Partial Accept	Market award accepted for a partial value in the ADS
ADS Decline	Market award declined to 0 MW in the ADS
ADS Accepted Value	Final MW value accepted in ADS and used in FMM
No E-Tag	Market award accepted but no E-Tag submitted to match the award

Intertie awards are accepted in the ADS (2 of 2)

DAM Award	HASP Instruction	HASP Award	Scheduling Coordinator Action	ADS Accepted Value
150 MW	+ 50 MW (INC)	200 MW	Accept	200 MW
150 MW	- 50 MW (DEC)	100 MW	Partial Accept	125 MW
150 MW	+ 50 MW (INC)	200 MW	Partial Accept	175 MW
150 MW	- 100 MW (DEC)	50 MW	Decline	0 MW

HASP awards should be accepted and supported with the submission of an E-Tag

- E-Tags serves as receipts and are used to determine the net scheduled interchange (NSI)
- The ISO fifteen-minute market begins running at ~T-40 and assumes the E-Tag value will equal the HASP schedule
- NAESB requires E-Tags are submitted by T-20
- E-Tags that are not submitted by T-20 to match the HASP schedule create operational challenges

If the HASP schedule cannot be delivered, scheduling coordinators should notify the ISO prior to the FMM

- HASP schedules should be accepted
- **Declined awards** (prior to T-40) allow the ISO markets to re-commit resources or manually dispatch
 - Scheduling coordinators decline awards in the ADS system
- If awards are accepted, but **no E-Tag** is submitted, the ISO market does not have time to make necessary adjustments
 - Real-time dispatch (RTD) must make up for the discrepancy

QUESTIONS?

Intertie Deviation Settlement

EXISTING DECLINE CHARGE

The existing decline charge was implemented in 2007

- The ISO conducted analysis of declined intertie awards and determined a charge for undelivered imports/exports was necessary
- Because unpredictable events may occur that are not the fault of the scheduling coordinator, a threshold was used to shield market participants from charges due to these events

The decline charge is only applied if declines exceed 10% of total MWh transactions over a month

- If declines are less than 10% of MWh transactions, no charge is applied
- If declines are more than 10% of MWh transactions, a decline charge of \$10 or 50% of the LMP (whichever is greater) will be applied per MWh that exceeds the threshold

FERC 764 introduced 15-minute scheduling and settlement for intertie resources

- As a result, the ISO settles all intertie resources based on the fifteen-minute market results
- Since the FERC 764 implementation, the ISO has recognized impacts of the decline charge in relation to fifteen-minute settlement of intertie resources

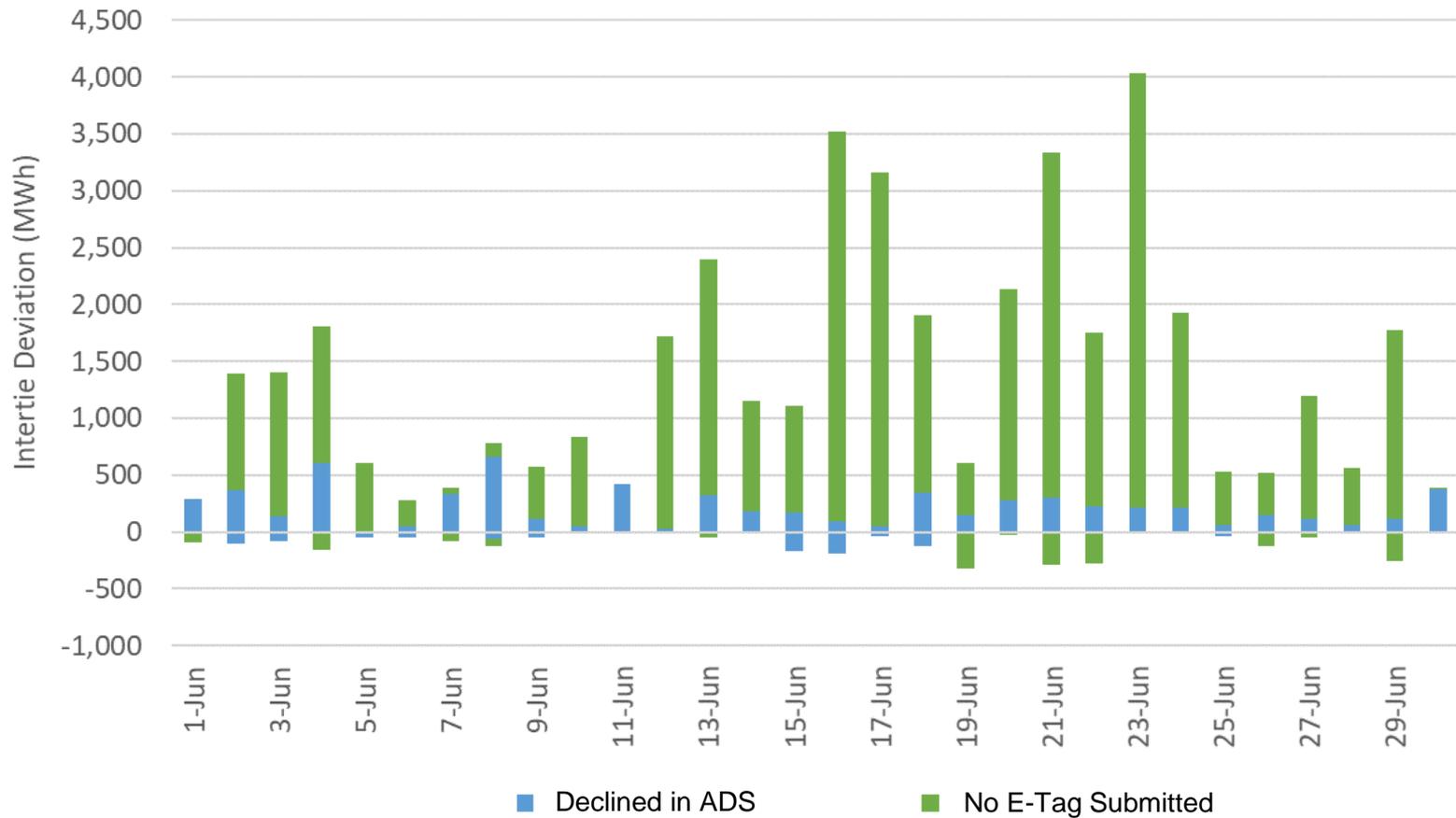
QUESTIONS?

Intertie Deviation Settlement

DATA & EXAMPLES

Undelivered interties primarily occur due to the failure to submit an E-Tag

Undelivered intertie resources in June 2018



Definitions (1 of 5)

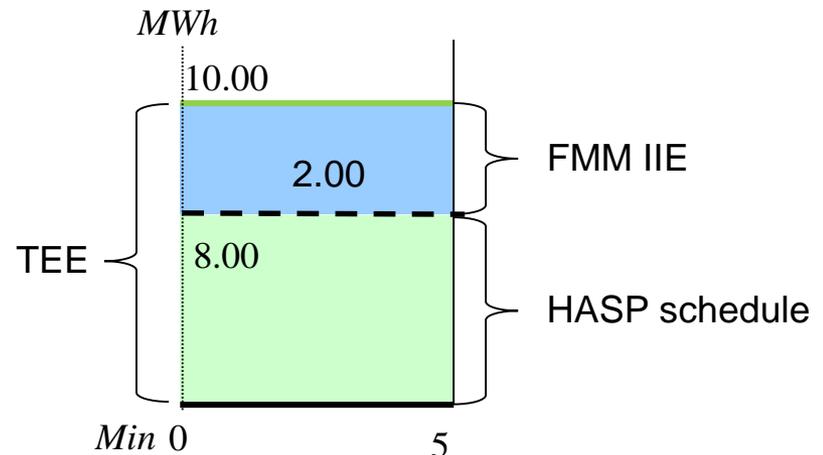
Term	Settlement Definition
Total Expected Energy (TEE)	Final dispatch instruction. For inertia resources this is typically the FMM binding award (unless exceptionally dispatched).
Instructed Imbalance Energy (IIE)	Instructed change between market runs.

Total Expected Energy (TEE) example:

$$\begin{aligned}
 \text{TEE} &= \text{HASP schedule} + \text{FMM dispatch} \\
 &= 8.00 \text{ MWh} + 2.00 \text{ MWh} \\
 &= 10.00 \text{ MWh}
 \end{aligned}$$

■ FMM Binding Award

■ HASP schedule



Definitions (2 of 5)

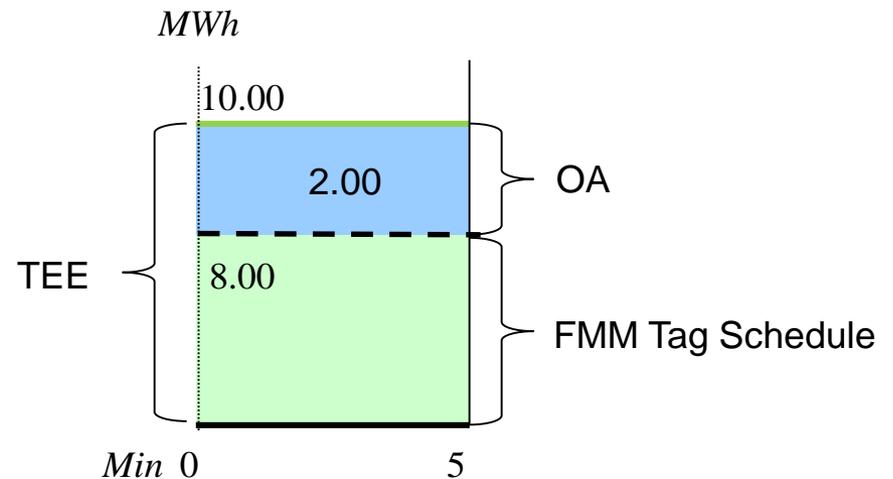
Term	Settlement Definition
Operational Adjustment (OA)	Difference between the E-Tag energy profile and the Total Expected Energy. OA for intertie resources is settled under RTD IIE.

Operational Adjustment (OA) example:

$$\begin{aligned} \text{OA} &= \text{TEE} - \text{FMM Tag Schedule} \\ &= 10.00 \text{ MWh} - 8.00 \text{ MWh} \\ &= 2.00 \text{ MWh} \end{aligned}$$

 Operational Adjustment

 FMM E-Tag Profile



Definitions (3 of 5)

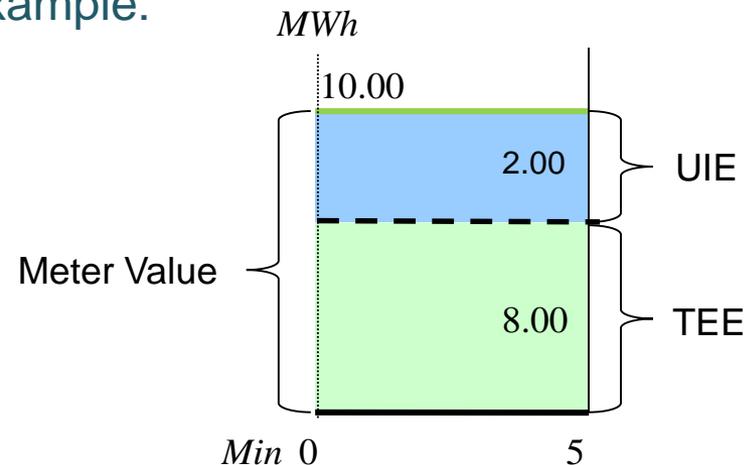
Term	Settlement Definition
Uninstructed Imbalance Energy (UIE)	Uninstructed deviation from RTD market dispatch. Compares the meter value (what was delivered) to the total expected energy (market dispatch).

Uninstructed Imbalance Energy (UIE) example:

$$\begin{aligned} \text{UIE} &= \text{Meter Value} - \text{TEE} \\ &= 10.00 \text{ MWh} - 8.00 \text{ MWh} \\ &= 2.00 \text{ MWh} \end{aligned}$$

 Uninstructed Imbalance Energy

 TEE



Definitions (4 of 5)

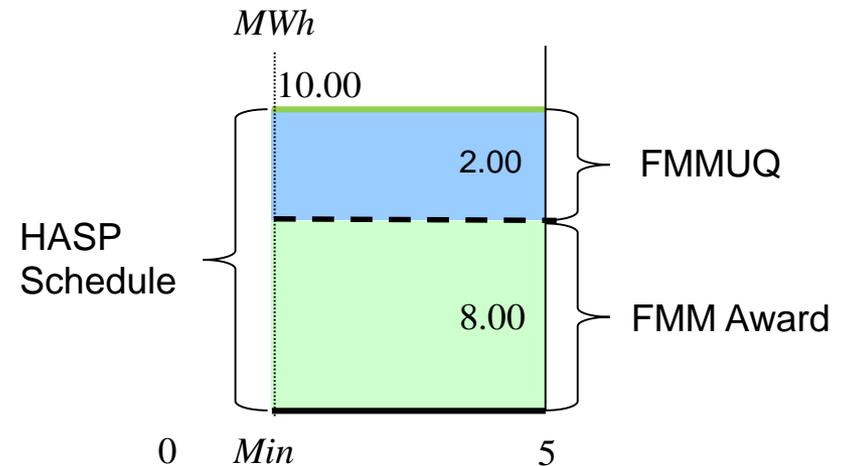
Term	Settlement Definition
FMM Undelivered Quantity	<p>Difference between HASP and FMM schedules that are not the result of an economic dispatch. These values are summed over a month to determine the total amount allocated towards the Decline Charge Penalty.</p> <p>*For economic hourly blocks, clearing 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.</p>

FMM Undelivered Quantity example:

$$\begin{aligned}
 \text{FMMUQ} &= \text{HASP Schedule} - \text{FMM Award} \\
 &= 10.00 \text{ MWh} - 8.00 \text{ MWh} \\
 &= 2.00 \text{ MWh}
 \end{aligned}$$

 FMM Undelivered Quantity

 TEE



Definitions (5 of 5)

Term	Settlement Definition
Decline Charge	A charge applied to market participants if the total FMM Undelivered Quantity over the course of the month exceeds 10% of total MWh intertie transactions for the corresponding month.
HASP Reversal Rule	A penalty applied if the E-Tag energy profile at T-45 does not match the corresponding Day Ahead Market (DAM) award. This incentivizes scheduling coordinators to tag DAM awards without needing a day-ahead decline charge.

Hour-ahead scheduling process schedules feed directly into the fifteen-minute market

FMM Binding Interval	Time of Operating Hour	Logic Used to Determine FMM Binding Award
1	00 – 15	ADS accepted award
2	15 – 30	ADS accepted award
3	30 – 45	E-Tag energy profile
4	45 – 00	E-Tag energy profile

Example #1 – Day-ahead market import declined

DAM award, no change in RTM, award declined in ADS

	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 binding award	0 MW	0 MW	0 MW	0 MW
eTag	0 MW	0 MW	0 MW	0 MW

Settlement	Quantity	Intervals	MWh
FMM Undelivered Quantity	100 MW	1 – 4	100 MWh
Operational Adjustment	0 MW	N/A	0 MWh

Example #2 – Day-ahead market import not tagged

DAM award, no change in RTM, no E-Tag 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 binding award	100 MW	100 MW	0 MW	0 MW
eTag	0 MW	0 MW	0 MW	0 MW

Settlement	Quantity	Intervals	MWh
FMM Undelivered Quantity	100 MW	3 – 4	50 MWh
Operational Adjustment	100 MW	1 – 2	50 MWh

Example #3 – Real-time market import declined

No DAM award, increase in RTM, award declined in ADS

	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 binding award	0 MW	0 MW	0 MW	0 MW
eTag	0 MW	0 MW	0 MW	0 MW

Settlement	Quantity	Intervals	MWh
FMM Undelivered Quantity	100 MW	1 – 4	100 MWh
Operational Adjustment	0 MW	N/A	0 MWh

Example #4 – Real-time market import not tagged

No DAM award, increase in RTM, no E-Tag 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 binding award	100 MW	100 MW	0 MW	0 MW
eTag	0 MW	0 MW	0 MW	0 MW

Settlement	Quantity	Intervals	MWh
FMM Undelivered Quantity	100 MW	3 – 4	50 MWh
Operational Adjustment	100 MW	1 – 2	50 MWh

Example #5 – Tag submitted for partial amount

DAM award, increase in RTM, E-Tag submitted for 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 binding award	120 MW	120 MW	80 MW	80 MW
eTag	80 MW	80 MW	80 MW	80 MW

Settlement	Quantity	Intervals	MWh
FMM Undelivered Quantity	40 MW	3 – 4	20 MWh
Operational Adjustment	40 MW	1 – 2	20 MWh

Example #6 – Tag curtailed for reliability reasons

DAM award, increase in RTM, E-Tag submitted for 120 MW and 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 binding award	120 MW	120 MW	80 MW	80 MW
eTag	80 MW	80 MW	80 MW	80 MW

Settlement	Quantity	Intervals	MWh
FMM Undelivered Quantity	40 MW	3 – 4	20 MWh
Operational Adjustment	40 MW	1 – 2	20 MWh

Failure to submit an E-Tag causes operational challenges but results in smaller decline charge allocation

- HASP schedules should always be delivered
- If they are not, advanced notification is beneficial for ISO markets and operators
- Existing decline charge is less severe when no E-Tag is submitted
- Existing decline charge does not distinguish between scheduling coordinator adjustments and reliability operator curtailments

Example # 7 – Real-time market export partially accepted

Export has no DAM award, increase in RTM, award partially accepted

	eTag	DA	HASP	Accepted DOT	Curtailed MW	Final eTag
	Import_1	50	50	50	5	45
	Import_2	100	100	100	10	90
Accepted incremental dispatch	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

QUESTIONS?

Intertie Deviation Settlement

OPEN ITEMS

The ISO requests stakeholder feedback on the following items, which will be further addressed in the Straw Proposal (1 of 2)

- How should the Decline Charge be changed to incentivize deliver of intertie resources?
 - Should the 10% threshold be eliminated or adjusted?
- How can the ISO address intertie resources that are not delivered due to the failure to submit an E-Tag?
- Should the ISO require E-Tags associated with hourly blocked resources be submitted by T-40?

The ISO requests stakeholder feedback on the following items, which will be further addressed in the Straw Proposal (2 of 2)

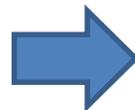
- Should the ISO's curtailment methodology move from hourly to 15-minute granularity?
 - Would this impact hourly blocked resources?
- Does the ISO need to receive 15-minute integrated E-Tag information instead of hourly integrated information?
- How should the ISO address a declined export resource that results in over-scheduling of an intertie?

QUESTIONS?

Intertie Deviation Settlement

NEXT STEPS

Proposed Initiative Schedule



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

Proposed EIM Governing Body Classification

- The Decline Charge impacts the real-time market
- “EIM GB has the right to submit to the Board its advice” on policies that impact the real-time market.
- The CAISO proposes the EIM Governing Body has a **advisory** role for this initiative

QUESTIONS?