California Independent
System Operator Corporation

April 28, 2016

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

Re: California Independent System Operator Corporation
Docket No. ER16-___-000

Energy Imbalance Market Year One Enhancements – Phase 2

Dear Secretary Bose:

The California Independent System Operator Corporation ("CAISO") submits this tariff amendment to revise the CAISO tariff governing the Energy Imbalance Market ("EIM").[1] The proposed modifications, resulting from Phase 2 of the CAISO's Energy Imbalance Market Year One Enhancements initiative, enhance functionality and address issues encountered during the first year of EIM operations. Specifically, the proposal (1) revises the assignment of the real-time congestion offset to balancing authority areas to better reflect the contribution of each to congestion at the interties; (2) provides that the CAISO will, upon request of an EIM entity, provide outage information directly to the reliability coordinator; (3) clarifies that the administrative costs included in the default energy bid and start-up cost and minimum load cost calculations for an EIM market participant should include the applicable EIM administrative charges and not the charges reflected in the CAISO's grid management charge; (4) specifies that base schedules must include approved, pending, and adjusted e-tags for imports and exports; (5) clarifies that implementing economic bidding at EIM external interties requires further development of appropriate market rules; (6) provides for real-time local market power mitigation of EIM transfers on EIM internal interties; and (7) includes greater tariff detail regarding calculation of the marginal losses component of the locational marginal price.

[1] The CAISO submits this filing pursuant to Rule 205 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.205 (2015) and section 205 of the Federal Power Act, 16 U.S.C. § 824d (2012).

The CAISO requests that the Commission permit this tariff amendment to become effective October 1, 2016. The CAISO requests that the Commission issue an order by July 1, 2016, so the CAISO can include all approved functionality in the market simulation for the participation of Puget Sound Energy and Arizona Public Service Company in the Energy Imbalance Market. The CAISO expects that the market simulation in preparation for the fall release will commence on July 5, 2016. The acceptance of these proposed changes and the participation of the two EIM entities are not directly dependent.[2] Therefore, the CAISO expects that it would not be necessary to change the requested effective date in the event there were a change in the EIM entities' implementation date.

I. BACKGROUND

The Energy Imbalance Market provides other balancing authority areas the opportunity to participate in the real-time market for imbalance energy that the CAISO operates in its own balancing authority area. PacifiCorp's two balancing authority areas were the first to join the Energy Imbalance Market. The CAISO's market rules for the energy imbalance market went into effect on October 24, 2014, with the initial trading day of November 1, 2014.[3] NV Energy began participating in the Energy Imbalance Market on November 2, 2015, and Puget Sound Energy and Arizona Public Service Company are expected to commence participation this October.[4] Portland General Electric and Idaho Power Company are expected to begin participation in fall 2017[5] and spring 2018[6], respectively.

Even before the Energy Imbalance Market commenced operations, the CAISO anticipated that the first year of actual operations would reveal a need for

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[2] The CAISO does not believe the proposed changes require any corollary changes in the EIM entities' Open Access Transmission Tariffs ("OATTs").

[3] *See Cal. Indep. Sys. Operator Corp.*, 147 FERC ¶ 61,231 (2014) (order conditionally accepting tariff revisions to implement Energy Imbalance Market); *Cal. Indep. Sys. Operator Corp.*, 149 FERC ¶ 61,058 (2014) (order denying requests for rehearing, granting in part and denying in part requests for clarification, and conditionally accepting tariff revisions on compliance with regard to order listed above); Letter Order, 149 FERC ¶ 61,005 (Oct. 2, 2014) (order granting CAISO request to extend effective date of Energy Imbalance Market tariff revisions from September 23, 2014, to October 24, 2014, for trading day November 1, 2014).

[4] *See Cal. Indep. Sys. Operator Corp*., 147 FERC ¶ 61,200 (2014), and *Cal. Indep. Sys. Operator Corp*., 151 FERC ¶ 61,158 (2015).

[5] *See Cal. Indep. Sys. Operator Corp.*, 154 FERC ¶ 61,020 (2016).

[6] *See* CAISO Press Release dated April 6, 2016.

potential market modifications to improve functionality as well as issues that the CAISO would need to address. For that reason, on October 28, 2014, the CAISO announced an Energy Imbalance Market Year One Enhancements initiative. The CAISO considered enhancements in two phases. The Commission conditionally approved the phase one amendments on October 26, 2015,[7] and approved the CAISO's compliance filing on February 3, 2016.[8] This filing represents completion of the second phase, and the proposed changes will facilitate the participation of Puget Sound Energy and Arizona Public Service Company, although their participation is not dependent on these changes.

II. STAKEHOLDER PROCESS AND BOARD CONSIDERATION

Following submittal of the Phase 1 amendments to the Commission, the CAISO posted an Issue Paper and Straw Proposal for phase 2 on June 30, 2015,[9] and followed up with a stakeholder meeting on July 8, 2015. After considering stakeholder comments,[10] the CAISO issued a Draft Final Proposal on September 8, 2015,[11] and held a meeting on the proposal on September 14, 2015. The CAISO again solicited and considered stakeholder comments.[12]

During the stakeholder process, the CAISO and stakeholders examined a number of issues in addition to the tariff revisions proposed in this filing. The CAISO discusses some of these issues following the discussion of the proposed tariff revisions.

On November 4, 2015, the CAISO presented the proposed revisions to its Board of Governors,[13] which approved them as proposed.[14] Following Board approval, on February 29, 2016, the CAISO posted draft tariff language. After

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7 *Cal. Indep. Sys. Operator Corp.*, 153 FERC ¶ 61,087 (2015).

8 Letter Order, *Cal. Indep. Sys. Operator Corp.*, Docket No. ER15-1919-004 (February 3, 2016).

9 Issue Paper and Straw Proposal – EIM Year 1 Enhancements Phase 2.

10 *See* comments on issue paper and straw proposal.

11 Draft Final Proposal – Energy Imbalance Market Year 1 Enhancements Phase 2.

12 *See* comments on draft final proposal.

13 Board materials included a memorandum and presentation.

14 *See* motion approving proposed enhancements.

receiving stakeholder comments,[15] the CAISO posted its responses.[16] The CAISO again reviewed the draft tariff language and comments with stakeholders on March 22, 2016. The CAISO posted a revised matrix of responses on March 31, 2016.[17] The proposed tariff language reflects input received in this process.

III. PROPOSED TARIFF REVISIONS

A. Allocating the Real-Time Congestion Revenues at Interties

The CAISO currently assigns congestion revenues attributable to EIM internal interties to balancing authority areas based on the number of participants that share the intertie.[18] The CAISO uses this assignment in allocating the real-time congestion offset. In practice, this means that congestion revenues at various EIM internal interties are shared equally between PacifiCorp and the CAISO, PacifiCorp and NV Energy, and the CAISO and NV Energy, depending on the intertie location. This methodology has been in effect since the initial implementation of the Energy Imbalance Market.

Two developments have caused the CAISO to consider revision of this methodology. The first is the nature of transactions at EIM internal interties. The Energy Imbalance Market initially relied upon PacifiCorp's making available merchant transmission ownership and contractual rights to support EIM transfers. To accommodate NV Energy's participation, however, the phase 1 enhancements authorized the use of available transmission capability for EIM transfers.[19] Second, adding new EIM entities meant that multiple EIM entities may have rights at the same intertie location.

The result is that the differing rights of EIM entities may result in different contributions to congestion at an intertie. The CAISO concluded that it should revise the assignment of congestion revenue to reflect these differing contributions. Accordingly, under the proposed revisions, the CAISO will evaluate the contribution to the congestion based on several differentiating factors, including the number of EIM entities that share an internal intertie, the

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15 *See* comments on tariff language.

16 *See* comments and CAISO response matrix.

17 *See* draft final tariff language and updated response matrix.

18 CAISO Tariff section 11.5.4.1.1(b). In addition, the CAISO by default assigns congestion revenue for EIM external interties and scheduling points to the EIM entity that manages the external intertie or to the CAISO as the entity that manages the scheduling point. This treatment does not change under the instant proposal, but the CAISO clarifies it as it relates to the changes being proposed.

19 *Cal. Indep. Sys. Operator Corp.*, 153 FERC ¶ 61,087.

rights made available to support the EIM transfer limit, and whether the intertie also operates as a CAISO scheduling point or an intertie external to the EIM.

As explained in more detail below, when congestion arises in connection with transmission to an EIM internal intertie, the CAISO will assign the revenues to the balancing authority areas that provide the transmission to the intertie in accordance with their shares of the EIM transfer limit; when the congestion arises in connection with transmission through an EIM internal intertie, the CAISO will share the revenues among the balancing authority areas based on the number of balancing authority areas on each side of the intertie. The distinction of whether the transmission made available gets to or through the intertie is based on whether the EIM transfer limit must compete at that location with transactions using transmission not provided by the CAISO or an EIM entity, *i.e.*, the intertie also operates as an EIM external intertie or CAISO scheduling point. The CAISO will continue to assign the revenues related to congestion at EIM external interties and scheduling points to the balancing authority area that manages the transmission rights on that intertie, which then sub-allocates the revenue according to its tariff. These changes are generally supported by all stakeholders and the CAISO believes it has addressed all concerns through the stakeholder process.

1. Congestion Offset Background

The CAISO's operation of the real-time market includes the Energy Imbalance Market rules, by which the CAISO extends the real-time markets into other balancing authority areas. When scheduling transactions within a balancing authority area, the CAISO models the balancing authority area's internal transmission limits. When scheduling interchange transactions, *i.e.*, transactions between balancing authority areas, in the real-time and day-ahead markets, the CAISO must respect the intertie scheduling limits, *i.e.,* the available capacity for the transfer at the intertie.

The Energy Imbalance Market models transmission limits internal to an EIM entity balancing authority area similarly to transmission limits between EIM entity balancing authority areas or with balancing authority areas outside of the EIM. This modeling distinguishes between EIM external interties and EIM internal interties. Interties between a balancing authority area in the EIM area and a balancing authority area outside the EIM area are EIM external interties. An EIM internal intertie is an intertie between two EIM balancing authority areas, or between an EIM balancing authority area and the CAISO balancing authority

area. Figures 1 and 2 represent these two types of interties as modeled in the Energy Imbalance Market:[20]

Figure 1

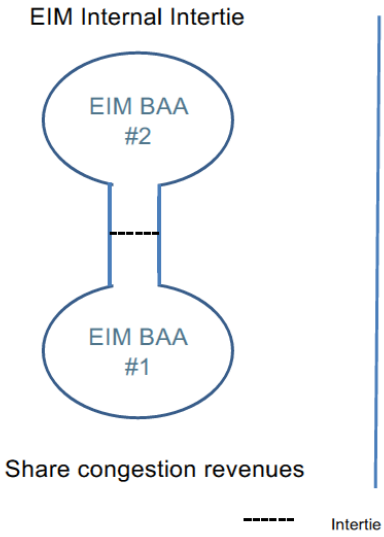
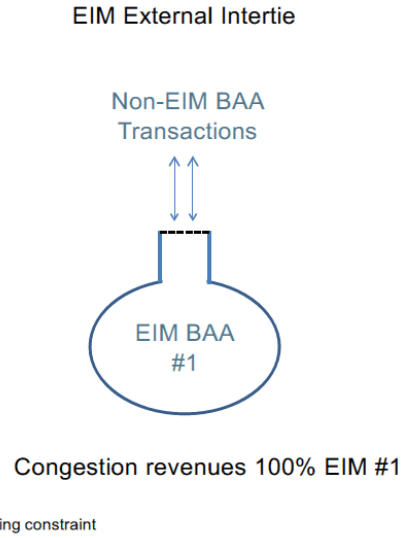


Figure 2



------ Intertie scheduling constraint

Part of the locational marginal price paid to suppliers is the value of congestion relief provide by energy injections at the particular location, *i.e.,* the marginal cost of congestion. Specifically, the marginal cost of congestion is the component of the locational marginal price that reflects the sensitivity of relieving congestion by increasing supply at the location balanced by an equal increase in demand at the reference bus. The CAISO's collection and payment of congestion revenues do not balance. A congested transmission path results in a lower energy price paid to supply on the upstream side of the limit than the energy price paid by downstream load, resulting in excess revenue collections by the CAISO. Similarly, unresolved congestion in base schedules causes redispatch in the real-time market, which gives rise to costs that are recovered through the real-time congestion offset. The real-time congestion offset is a neutrality account designed specifically to account for imbalances in congestion revenue and credits in the real-time market. To derive the real-time congestion offset amount for each hour of the real-time market, the CAISO calculates the difference between the total real-time congestion revenue and congestion payments.

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[20] In addition, an EIM intertie may operate simultaneously as an EIM internal or external intertie and a scheduling point in the CAISO's day-ahead market.

The internal transmission limits, intertie scheduling limits, and EIM transfer limits result in congestion revenues and congestion payments.[21] Under the current Energy Imbalance Market design, section 11.5.4.1.1 allocates the congestion revenue attributable to a balancing authority area's internal transmission constraints to the balancing authority area in which the internal transmission constraint is located. As noted above, the current design shares the congestion revenues attributable to EIM transfer limits on EIM internal interties among the balancing authority areas in the EIM area that share the EIM transfer limit. The CAISO also allocates the congestion revenues resulting from transmission limits on interties connecting an EIM balancing authority area to a non-EIM balancing authority area to the EIM balancing authority area to which the intertie is connected, *i.e*., to the EIM balancing authority that manages the EIM base schedules at that intertie.

2. Need for Alternative Methodology

One of the issues considered as part of the phase 2 enhancements initiative was whether the equal sharing of congestion revenues among balancing authority areas that share an EIM internal intertie is appropriate when the EIM transfer limit and an intertie scheduling constraint exist simultaneously. This occurs when an intertie operates both as an EIM internal intertie and an EIM external intertie or CAISO scheduling point. The following figure illustrates this situation:

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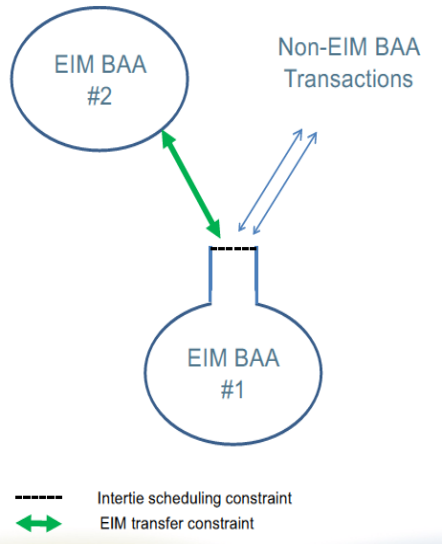
[21] In the real-time market, in addition to intertie scheduling limits, the CAISO enforces "EIM transfer limits," which represent the amount of transmission an EIM entity has made available to the Energy Imbalance Market for energy transfers into and out of the EIM entity's balancing authority area. These may be less than the intertie scheduling limit.

Figure 3



Under such circumstances, EIM transfers compete in the market with non-EIM imports and exports for the same intertie capacity. The current allocation assigns the congestion revenue collected on such EIM transfers the same as with other EIM internal interties, *i.e.*, evenly between the two balancing authority areas. Congestion revenues, however, can occur on both the EIM transfer constraint and the intertie scheduling constraint. The congestion revenues from the EIM transfer are independent of those on the intertie scheduling limit. Congestion revenues arising from the intertie scheduling limit and those arising from the EIM transfer limit represent two different constraints and thus two congestion revenue sources.

Congestion revenues arising from the intertie scheduling limit include those arising from other imports or exports in addition to EIM transfers in Figure 3 above. When the EIM transfers into balancing authority area #1 do not compete with non-EIM imports to use the intertie, the transmission provider supporting the intertie scheduling limit essentially is providing transmission "through" the intertie. As a result, the congestion revenue associated with transmission that is made available to support EIM transfers through the intertie should be allocated on the same basis as an intertie that operates only as EIM internal intertie as represented in Figure 1, *i.e.*, by dividing the revenue equally to each side of the intertie and then allocating the revenue on each side among the EIM balancing authority areas that share that side of the intertie.[22] Similarly, because the

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[22] This circumstance would require the presence of an EIM entity making rights

constraint reflected in figure 3 behaves the same as the constraint in figure 2, congestion revenue attributable to the intertie scheduling limit at the same intertie location should be allocated on the same basis as an EIM external intertie, *i.e.*, to the balancing authority area that manages the intertie scheduling point. The second example in the next section illustrates this assignment of congestion revenues.

In contrast, the transmission rights represented purely by the EIM transfer limit does not ensure availability of the intertie scheduling limit. It only ensures there is sufficient transmission to reach the intertie. EIM transfers must compete with other market transactions at the intertie scheduling point. In such a case, the transmission provider essentially is providing transmission only "to" the intertie because the transmission on the other side of the intertie is made available by another EIM entity or the CAISO. Splitting congestion revenues equally on the EIM transfer constraint ignores that distinction. Under such circumstances, the congestion revenues attributed to the EIM transfer limits should be allocated the same as congestion revenues due to internal transmission limits, which is to the EIM entity making the transmission available to the intertie. The first example in the next section reflects this assignment of congestion revenues.

The CAISO proposes to address these issues by revising the allocation of the real-time congestion offset. Initially, the CAISO proposed to distinguish the potential circumstances according to whether the scheduling limit or EIM transfer limit was binding. Because the addition of new EIM entities does not affect the allocation of congestion revenues attributable to an EIM balancing authority area's internal transmission limits or to an EIM external intertie that does not also operate as an EIM internal intertie, the CAISO did not propose to modify those allocations. Because transmission to which the intertie scheduling limit at an EIM internal intertie applies is effectively shared by the balancing authority areas, the CAISO proposed to maintain a proportional sharing of the credits attributable to congestion at those interties. Where the EIM transfer limit was binding, however, the CAISO proposed to allocate the portion of the congestion offset attributable to the EIM transfer limit to the EIM entity that provides transmission to the intertie scheduling point and the portion attributable to the intertie scheduling limit to the EIM entity managing the transmission rights at the intertie.

During the stakeholder process to develop tariff language, the CAISO recognized the need to describe the distinction in a manner different than it had discussed in the policy development phase because the participation of additional balancing authority areas complicates the allocation of congestion

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available on both sides of an EIM internal intertie, which is possible but does not presently exist in the Energy Imbalance Market.

revenues. For example, more than two balancing authority areas may have rights at an EIM internal intertie. In addition, more than one balancing authority area in the EIM area may have rights at an intertie that is both an EIM internal intertie and an EIM external intertie. Accordingly, the CAISO, as discussed in greater detail below, drafted the tariff language to distinguish transmission rights through and to the intertie. This reflects the possibility that multiple balancing authority areas in the EIM area may share an intertie scheduling point.

3. Proposed Congestion Offset Changes

The proposed revision to section 11.5.4.1.1 addresses all of the considerations and complications described above. In order to maintain equitable sharing of the congestion revenue on strictly EIM internal interties when there is more than one EIM entity on one or both sides of the intertie, the proposed revision would replace the 50-50 split with an assignment of the revenue that divides it equally to each side of the intertie and then assigns the congestion revenue for each side equally among the balancing authority areas that share that side of the intertie.[23] The CAISO will continue to assign congestion offset revenues attributable to an external intertie to the EIM entity managing the transmission made available on the intertie, *i.e.*, the base import/export schedules submitted in the Energy Imbalance Market.[24] This same approach would apply to a CAISO scheduling point since they operate in a similar manner.

As illustrated in Table 1 below, multiple EIM entities have made available transmission to support transfers between the balancing authority areas. The combination of all transmission made available allows EIM transfers to flow through the intertie scheduling point. Resources within the EIM area compete, which results in transfers between the balancing authority areas up to the 1000 MW EIM transfer limit. The CAISO first assigns each side of the intertie 50% of the congestion revenue. Next, the EIM entity balancing authority areas on each side of the intertie share that revenue according to their contribution to the EIM transfer limit, which in this example is 50-50 and 60-40. This is how the CAISO assigns congestion revenues for interties that operate only as an EIM if the intertie is shared with an EIM external intertie or scheduling point and the EIM entity makes transmission rights available on both sides of the intertie.[25]

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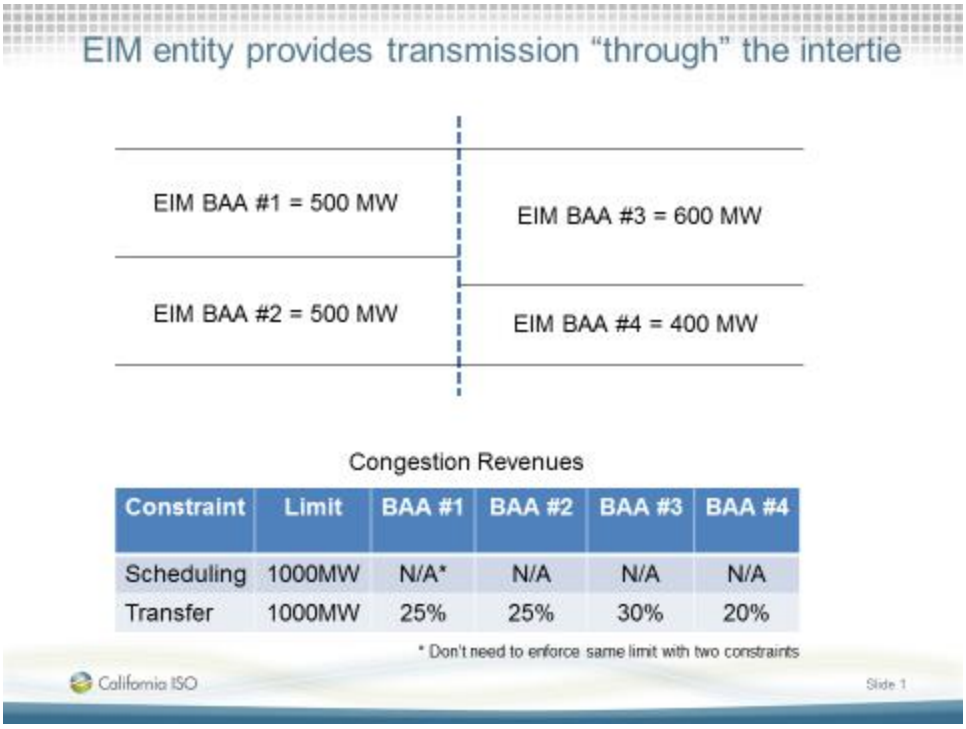
[23] Proposed CAISO Tariff section 11.5.4.1.1(c)(2).

[24] Proposed CAISO Tariff section 11.5.4.1.1(c)(4).

[25] *Supra* ft. 22 (noting that this circumstance does not presently exist in the Energy Imbalance Market).

Table 1



Allocating the congestion revenues associated with a mixed EIM internal and EIM external intertie requires addressing the fact that some schedules on the internal intertie may use rights where they do not have to compete for use of the intertie, and others may use rights where they do have to compete. The proposed revision to section 11.5.4.1.1 treats each aspect of this configuration consistently with the allocation that would apply absent the combination. At such interties, the CAISO will: (1) assign congestion revenue attributable to a constraint associated with the CAISO's or the EIM entity's provision of transmission to the EIM internal intertie to the balancing authority areas of the CAISO or the EIM entity that provides transmission to the EIM internal intertie in proportion to the contribution of each to the EIM transfer limit; (2) assign congestion revenue attributable to a constraint from the CAISO's or an EIM entity's provision of transmission through the EIM internal intertie to the balancing authority areas of the CAISO or EIM entity that provides transmission through the EIM internal intertie in accordance with the allocation for solely internal interties; and (3) assign congestion revenue responsibility for the congestion attributable to the EIM external intertie or the scheduling point to the balancing authority area that manages the transmission made available on that intertie.[26]

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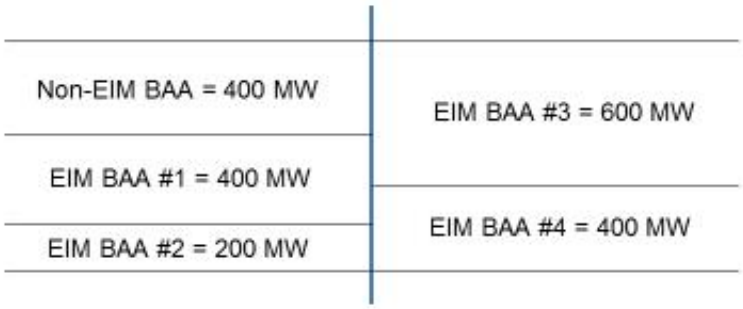
[26] Proposed CAISO Tariff section 11.5.4.1.1(c)(3).

In Table 2 below, EIM entity #1 and EIM entity #2 have provided transmission to an intertie scheduling point that is jointly managed by EIM balancing authority area #3 and EIM balancing authority area #4. The transmission made available by EIM entity #1 and EIM entity #2 create an EIM internal intertie that exists at an intertie scheduling point that also operates as EIM external intertie. In this case, EIM entity #1 and EIM entity #2 proportionally share 100% of the congestion revenues on the EIM transfer limit. EIM entity #3 and EIM entity #4 proportionally share the congestion revenues on the intertie scheduling limit.

Table 2

EIM entity provides transmission "to" the intertie and an EIM external intertie also exists at that location



Congestion Revenues

Constraint	Limit	BAA #1	BAA #2	BAA #3	BAA #4
Scheduling	1000MW	0%	0%	60%	40%
Transfer	600MW	67%	33%	0%	0%

California ISO Slide 2

In sum, the proposed revisions require that the CAISO assign congestion revenues to a balancing authority area in the EIM area based on differentiating factors, including the number of EIM entities that share an EIM internal intertie, the rights made available to support the EIM transfer limit, and whether the intertie also operates as a CAISO scheduling point or an intertie external to the EIM. This allows the CAISO to assign the congestion revenues to the balancing authority area more accurately than the current design. An EIM transfer does not create transmission capacity to support an EIM transfer through a scheduling limit is equivalent to any other transmission made available within an EIM entity's balancing authority area. When multiple balancing authority areas in the EIM area make transmission available by allowing EIM transfers to occur though an intertie schedule point, the relevant balancing authority areas in the EIM area

share the constraint location and, likewise, the congestion revenues are shared proportionally. Thus, the proposal better reflects the location of the constraint and assigns the congestion revenue consistent with the objective of the real-time congestion offset.

4. Stakeholder Comments

The CAISO's Department of Market Monitoring endorsed the CAISO's proposal as a more efficient and equitable than the current approach, citing the failure of the current approach to provide incentives for procuring incremental capacity for EIM transfers.[27] The two existing EIM entities and Puget Sound Energy, which has agreed to become an EIM entity, also support the proposed approach.[28] Two stakeholders expressed concerns regarding the proposal and one raised questions, all of which the CAISO discusses below. No other stakeholder raised issues with the proposal in their comments.

Southern California Edison Company raised three questions regarding the CAISO's proposal: (1) whether the proposal can create revenue shortfall to the market; (2) whether its proposal would create undesired market incentives; and (3) how the proposal will be applied when there are multiple EIM Entities (*e.g.*, NV Energy, Puget Sound, and Arizona Public Service Company) and when multiple parties, including load serving entities, pay for the transmission.[29] Six Cities concurred with these concerns.[30]

The Department of Market Monitoring provided a response to those concerns with which the CAISO concurs. In summary, revenue shortfalls are unlikely. The CAISO derives the allocation of the real-time congestion offset for each constraint, including EIM transfer constraints, in the same way that the real-time congestion offset is created in the market: from changes to base schedules in real-time. In other words, base schedule imports and exports from an EIM balancing authority area to the CAISO balancing authority area could cause the EIM transfer constraint to bind even absent incremental EIM transfers occurring in real-time. Only real-time incremental changes from the base schedule would count toward the EIM transfer limit and could make it bind. Therefore, the

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27 *See* Comments of Department of Market Monitoring at 1.

28 Comments of NV Energy, PacifiCorp, and Puget Sound Energy.

29 *See* Comments of Southern California Edison Company.

30 *See* Comments of the Cities of Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside.

allocation method will be allocating the exact congestion revenues that the CAISO collects from the real-time changes to base schedules.[31]

The Department of Market Monitoring also concluded that the proposal would not provide an incentive to withhold capacity. Transmission rights between two EIM balancing authority areas that are not made available for EIM transfers should, under most conditions, still be used for base schedules that transfer power between the two EIM balancing authority areas. This would not generally constitute withholding of transmission capacity. Transmission capacity between two EIM balancing authority areas would only be potentially withheld if some portion of an EIM balancing authority area's scheduling rights to an EIM intertie is not made available to support EIM transfers and is not ultimately used to schedule power between the two EIM balancing authority areas.[32]

The Department of Market Monitoring argued that the proposal does not need to include measures to mitigate potential withholding of EIM transfer capacity. In current and prospective EIM balancing authority areas, the parent company of the EIM entity will generally control most of the generation that would be dispatched up in real-time to support the real-time transfers that create the real-time congestion revenues. Therefore, the excess revenues from creating congestion would be entirely (or near entirely) offset by the lower price (and revenues) received by the generators of the EIM entity, to the extent that the same parent company owns most of the generation and the transmission assets, as is generally the case. In addition, the EIM entities receiving congestion revenues do not retain them, but must sub-allocate them according to their OATTs. As a result, conditions with the magnitude and predictability to provide an incentive to withhold EIM transfer capacity are not likely.[33]

Southern California Edison Company's last concern was similar to two questions that Pacific Gas and Electric Company raised: How will congestion rents be allocated if there are multiple EIM entities that share an EIM intertie; and how will congestion rents that are allocated to an EIM entity be sub-allocated to the entity that pays for the transmission?[34]

The CAISO cannot provide a definitive answer to the second question because the sub-allocation is the responsibility of the EIM entity and is handled

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31 *See* Comments of Department of Market Monitoring at 3.

32 *Id.* at 2.

33 *Id.*

34 Pacific Gas and Electric Company also asked how the CAISO will model congestion shadow prices on interties in the real-time market. The CAISO's proposal does not alter the manner in which the CAISO models shadow prices at interties.

according to its tariff. This is consistent with the approach of the Energy Imbalance Market, which only provides for the CAISO allocation of costs and credits among EIM entities.

As noted above, the question regarding multiple EIM entities at an intertie location is one that the CAISO addressed through its stakeholder process to develop tariff language, which occurred subsequent to South California Edison Company's and Pacific Gas and Electric Company's comments.

Powerex generally supports the proposed revisions, but requests that the CAISO modify the proposed tariff language to clarify that it applies only to congestion offset revenues for EIM transfers over the transmission facilities of EIM entities, and not to congestion offset revenues for EIM transfers over third-party transmission facilities.[35] Such clarification is not necessary. When an EIM entity makes transmission rights available to the Energy Imbalance Market, it makes no difference from a congestion offset perspective whether the rights are on the EIM entity's transmission system or on the transmission system of a third-party transmission service provider. Under the Energy Imbalance Market, congestion is never attributed to the third-party transmission system itself. If the rights made available by an EIM entity on a third-party transmission system are binding at an EIM internal intertie, then the EIM entity's rights and the EIM transfers would be constrained accordingly and the associated congestion revenues allocated to the EIM entity as proposed. The CAISO does not generally calculate or manage congestion on third-party transmission service provider systems, and it is not appropriate that the third-party transmission system be included in the congestion offset revenue allocation process.[36] Thus, to the extent that by "congestion offsets for EIM transfers over third-party transmission facilities" Powerex means rights of an EIM entity on a third transmission service provider system that support EIM transfers, the proposed language applies, and is intended to apply, to both rights on the EIM entity's transmission system or on the transmission system of a third party.

To the extent Powerex is referring to a case where the third party itself makes its transmission capacity available to the Energy Imbalance Market, or where an entity other than an EIM entity makes third-party transmission capacity available, there is no need for clarifying language because this scenario does not exist currently in the Energy Imbalance Market. Although the CAISO has initially

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35 Comments of Powerex at 2-3.

36 The CAISO respects all physical and scheduling limits on third-party transmission service provider systems, including agreed upon flowgates; however, congestion resulting from such constraints would be considered internal to the EIM entity balancing authority area, and are not part of the third-party transmission service provider system.

discussed with stakeholders the possibility of allowing this functionality in the future, there is currently no mechanism to support third-party transmission rights being made available for EIM transfers.[37] Thus, there cannot be any congestion offset revenue attributable to the third-party transmission system. The CAISO will address the allocation of congestion revenue allocation in connection with such a mechanism if and when the CAISO develops and implements such a mechanism.[38] This issue is beyond the scope of these tariff revisions.

Powerex also raises the question whether the CAISO should allocate the congestion offset revenues to the third-party transmission owner or the entity providing the rights on the third party's system. Again, the only circumstance in which this currently arises is when the party providing the rights on the third-party system is the CAISO or an EIM entity. In the CAISO balancing authority area, the CAISO refunds congestion revenues to load-serving entities and congestion revenue rights holders, not transmission owners or rights holders. With respect to the second situation, the CAISO has no direct relationship with the load-serving entities in the EIM entity balancing authority areas. Under the tariff, each EIM entity acts as the proxy for the load-serving entities in its balancing authority area and may sub-allocate those amounts under its open access tariff, generally to the measured demand of its transmission customers. That sub-allocation is also beyond the scope of the CAISO tariff and this initiative. It remains a matter to be considered by each EIM entity in proposing changes to its OATT that implement the Energy Imbalance Market. The sub-allocations proposed by the EIM entities are subject to Commission approval as just and reasonable and there should be no consideration of such questions here.

B. Providing Outage Information

Currently, in the Western Electric Coordinating Council area, each balancing authority is responsible for submitting outage information into the regional reliability coordinator outage application. It is common practice for

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[37] *See* Draft Final Proposal – Energy Imbalance Market Year 1 Enhancements Phase 2, at pp. 17-18.

[38] The CAISO appreciates the benefits that the availability of third-party transmission for EIM transfers would have and remains open to considering how those benefits could be realized. Nothing in this proposal restricts or dictates how that could work and what compensation may be appropriate. In fact, the proposal makes it possible to recognize the assignment of congestion revenues based in part on the transmission made available "to" or "through" an intertie. Also, nothing prevents an EIM entity from opening up the opportunity for third-party transmission in the EIM balancing authority area to be offered for use in the Energy Imbalance Market. However, this would presumably require the developing a mechanism for transfer of the transmission rights to the EIM entity and sub-allocating the congestion revenue to the third party.

smaller balancing authorities to submit outage information directly into the regional reliability coordinator's outage application system. In addition, an EIM entity must enter approved outages within its balancing authority area into the CAISO's outage management system in support of Energy Imbalance Market functions. This presents an unnecessary duplication of effort.

The CAISO proposes to revise tariff section 29.9 to allow an EIM entity to request that the CAISO submit outage information that the EIM entity has entered into the CAISO's outage management system to the reliability coordinator on behalf of the EIM entity. This proposal would eliminate the need for the balancing authority to develop its own outage application or to report outage information manually into two systems. The proposal would not change the reliability responsibilities of the EIM entity and no liability would be assumed by the CAISO in providing this service. No stakeholder opposed this proposal, which will be less burdensome and more efficient, and a number of stakeholders supported it.[39]

C. Default Energy Bid and Start-Up Cost and Minimum Load Cost Calculations

Current tariff section 29.30 provides (with one exception) that section 30, regarding bid and self-schedule submission, applies to EIM market participants. Section 30 governs the calculation of start-up and minimum load cost and provides for a proxy cost methodology in section 30.4.1. The proxy cost calculation includes as a cost the market services charge and the system operations charge, which are part of the CAISO's grid management charge.

Similarly, section 29.39 provides that, with certain exceptions, the CAISO will apply the real-time local market power mitigation procedure in section 39.7 to the Energy Imbalance Market. Section 39.7 provides for calculating the default energy bid using a grid management charge adder consisting of the market services charge and the systems operation charge.

During the course of preparing the tariff language for this filing, it came to the CAISO's attention that applying these provisions to the proxy costs and default energy bid of EIM market participants was not appropriate because, under section 29.11(i) they do not pay the CAISO grid management charge, but rather the EIM administrative charge, which sets forth a different market services charge and systems operation charge. The CAISO therefore proposes to revise sections 29.30 and 29.39 to include the market service charge and system operations charge reflected in the EIM administrative charge in calculating default energy bids and start-up and minimum load costs. This clarification

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39 *See* Comments of NV Energy, PacifiCorp, and Puget Sound Energy.

simply reflects the appropriate EIM charge components, which is fully consistent with existing policy. No stakeholders objected to this suggested revision during the tariff development process.

D. Inclusion of E-Tags in Base Schedules

During discussions with PacifiCorp and NV Energy, the CAISO determined that, as the market operator, it needs to specify which e-tags EIM entities can use to establish base schedules for EIM imports and exports. Providing EIM entities with discretion can cause confusion because a base schedule import for one EIM entity balancing authority area could also be a base schedule export for another EIM entity balancing authority area. Therefore, the CAISO proposes to revise section 29.34 to require all EIM entities to accept approved, pending, and adjusted e-tags as a valid means to communicate an import or export base schedule to an EIM entity for purposes of imbalance settlement. This will ensure accurate and consistent information regarding transmission capacity available for EIM transfers. Otherwise, one EIM entity may not include all e-tags in its base schedules, which would create an inconsistency in the market. Having standard rules regarding base schedules applicable to all EIM entities addresses this concern.

The CAISO also proposes to eliminate the requirement that EIM base schedules must disaggregate the forward export schedules to other balancing authority areas because this requirement is unnecessary. Initially, the CAISO thought it would require the forward export schedules to be disaggregated from the base schedules. Experience has shown the CAISO does not need the information presented in this manner and, thus, proposes to eliminate this unnecessary requirement.

No stakeholder opposed standard base schedule treatment of e-tags for communicating the base schedule of imports and exports, and some expressed strong support.[40] Arizona Public Service Company expressed concern, however, about using pending e-tags in connection with financially binding base schedules. Specifically, Arizona Public Service Company is concerned about settlement differences between the losses component of the locational marginal price and the cost of providing real power transmission losses under an EIM entity open access tariff if the pending e-tag is rejected. This concern is related to the submission of base schedules prior to the WECC tagging deadline, which is after the start of the real-time market.

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[40] *See* Comments of Deseret Power Electric Cooperative, NV Energy, and PacifiCorp.

The purpose of this tariff change is to ensure that an EIM entity that has an export to an adjacent EIM entity balancing authority area that is supported by a pending e-tag will include this export as a base schedule and the adjacent EIM entity balancing authority area will include this import as a base schedule. In the event this pending tag was not approved, then the export included in the EIM entity's base schedule would have an imbalance paid at the intertie scheduling point price, and the adjacent EIM entity balancing authority area would have an imbalance charge at the intertie scheduling point price. For the market participant, the settlement should net to zero even though the market participant would have non-zero settlement with both EIM balancing authority areas. If the EIM entity balancing authority areas had different rules for accepting pending tags, then the EIM market participant would be unnecessarily exposed to settlement differences. The CAISO believes that the need for consistent market participant treatment outweighs the concerns of an EIM entity, particularly given that the EIM entity could have the opportunity to correct for such circumstances under its OATT while the EIM market participant would not.

Including pending e-tags eliminates the confusion between exports and imports and the need to wait until the second balancing authority area accepts the e-tag. The CAISO believes these benefits outweigh the concern that has been expressed. Foremost, the CAISO must accurately model the base schedules that are submitted. The CAISO proposal achieves this objective. Further, if losses settlement issues arise, they are best handled through the EIM entity's OATT and not through the CAISO tariff. Other options were considered but each risked not fully accounting for losses. Moreover, an EIM entity can adjust for losses on its system, but an EIM market participant would be exposed to settlement differences that it would be unable to address. The proposal achieves these goals, does not preclude an EIM entity from considering measures it may deem necessary, and is therefore the preferred approach.

E. Market Rules for Economic Bidding at External EIM Interties

The Energy Imbalance Market enhances congestion management across the EIM area because it accurately models injections and withdrawals of energy at the resource level. The CAISO's real-time market, in which EIM entities participate under the Energy Imbalance Market rules, supports fifteen-minute economic bidding at the interties, which is a non-resource specific dispatch. Under the current Energy Imbalance Market tariff, however, economic bidding at EIM external interties is not permitted unless an EIM entity authorizes it. No EIM entity requested that economic bidding be enabled on its interties because of the additional complexity this would add at the startup of their participation in the Energy Imbalance Market. Accordingly, the CAISO recognized that this issue should be revisited as part of its EIM year one enhancements efforts after participants gained experience and were no longer focused on initial implementation.

The CAISO initially proposed in the stakeholder process to make economic bidding on EIM external interties mandatory subject to stakeholder review. However, stakeholders were divided on this issue. Power marketers supported pursuing this change arguing that expanding bidding at EIM external interties would provide benefits if it resulted in increased liquidity in the 15-minute market. For example, it could provide additional opportunities to load serving entities to hedge imbalance energy exposure by using resources external to their balancing authority area. Further, it potentially could address settlement inefficiency that arises from applying different rules in different balancing authority areas. On the other hand, EIM entities expressed concern about a requirement that they enable economic bidding on their interties without understanding all of its implications. Subsequently, additional issues relevant to a decision whether to permit economic bidding on the interties under EIM have come to light.

First, the CAISO's general experience with fifteen-minute economic bidding at its own interties suggests that the extent of the benefits from allowing such bidding is questionable. During the stakeholder workshop in October 2015 regarding import and export liquidity in the fifteen-minute market,[41] stakeholders observed that only a limited quantity of supply was willing to be scheduled on a fifteen-minute basis. Such scheduling increases transaction costs because the CAISO requires suppliers to procure external transmission prior to the start of the fifteen-minute market. The CAISO then observes the transmission profile during the fifteen minute market optimizations to ensure that awarded incremental fifteen-minute market schedules will be approved by external balancing authorities. Stakeholders expressed concern during the EIM enhancements effort that this added transmission cost was difficult to incorporate into their energy bid.

Second, discussions during the EIM enhancements stakeholder initiative revealed additional issues that need to be addressed. For example, the CAISO does not currently calculate default energy bids—which play a significant role in settlements—for fifteen-minute exports and imports. This could undermine the available balancing capacity mechanism for avoiding price excursions because the CAISO has not developed rules to mitigate a high-priced bid when EIM transfers into or out of the balancing authority area are binding.

Third, the Energy Imbalance Market relies on the current full network model, which does not yet incorporate all possible sources for intertie bids.

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41 *See* presentations at Discussion of Import and Export Liquidity in the 15-Minute Market.

Fourth, it would be problematic if a single EIM entity requested the CAISO to permit it to allow economic bidding at interties under the current tariff. Having one EIM balancing authority area with economic intertie bidding could shift flows to some interties.

Although the CAISO discussed measures to address these concerns with stakeholders, the CAISO concluded that (1) it should not move forward with mandatory fifteen-minute bidding at the interties until appropriate rules and procedures are in place, and (2) it would be imprudent to maintain the option for an EIM entity to enable economic bidding on its interties prior to such time. Accordingly, the CAISO proposes to revise its tariff to require the development of appropriate rules and procedures before economic bidding at EIM external interties can commence. In addition, there may be other means to enhance participation that provide equal or greater benefit without raising the concerns expressed by stakeholders. For example, it may make more sense to focus on reducing barriers to entry by smaller balancing authority areas, which includes the resource specific benefits noted above, rather than increasing participation by non-specific resources outside of the EIM area.

Stakeholders generally understood the reasons for the CAISO's decision to defer consideration of this issue. However, during the tariff development process, some stakeholders argued that the proposed tariff language requiring the development of appropriate rules and procedures before economic bidding at EIM external interties can commence was not specifically approved by the Board of Governors. These stakeholders ignore that Board of Governors does not approve—and never has approved—the specific tariff language the CAISO files. The Board approves the general tariff amendments the CAISO files, consistent with the applicable Board motion and Board memorandum.

In this instance, the Board motion approving the instant tariff amendment filing stated "[m]oved that the ISO Board of Governors approved phase 2 of the energy imbalance market year 1 enhancements proposal, as described in the memorandum dated October 28, 2015." That Board memorandum, linked *supra,* expressly stated that "[m]anagement will address other items in separate currently planned stakeholder initiatives, including economic bidding rules on EIM external interties." Thus, the proposed tariff language is consistent with the Board's recognition that rules regarding economic bidding on EIM external interties would be addressed later.[42] These same stakeholders also raised concerns about deferring the issue without establishing a definitive timeframe for resolution. In light of the scope of the potential issues that must be addressed and the CAISO's need to address other pending matters and priorities

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[42] *See* Board Memorandum at p. 2 (noting that economic bidding on EIM external interties was discussed during the stakeholder initiative).

established through the CAISO's annual stakeholder initiatives catalog process, it would be inappropriate to establish a definitive timeframe by which the CAISO must resolve these issues and make a section 205 filing. Indeed, the requirement these stakeholders seek would inappropriately impinge on the CAISO's section 205 authority under the Federal Power Act. The CAISO believes it appropriate to initiate consideration of these questions through the CAISO market initiatives catalog process, which starts in the fourth quarter of each year and prioritizes stakeholder initiatives for the upcoming year.[43]

F. Local Market Power Mitigation of EIM Transfers on EIM Internal Interties

In its initial proposal for the Energy Imbalance Market, the CAISO proposed to use a process based on its existing local market power mitigation approach to mitigate local market power in each participating balancing authority area. In addition, the CAISO proposed to monitor transfers between EIM balancing authority areas and, following a structural competitiveness analysis and, upon the approval of the CAISO Board of Governors, to apply mitigation if market power exists at the balancing authority level. In approving the Energy Imbalance Market tariff amendment, however, the Commission directed the CAISO to seek Commission approval prior to mitigating bids at EIM internal interties.[44] In response to the Commission's directives, the CAISO substituted Commission authorization for CAISO Board of Governors authorization. The Commission also recognized that the CAISO may propose additional tariff detail regarding the application of market power mitigation on EIM internal interties.[45]

As part of the stakeholder process underlying this tariff amendment filing, the CAISO explored additional triggers for including EIM transfer constraints in the CAISO's market power mitigation procedures. Based on that consideration, the CAISO proposes to revise section 29.39 to treat EIM transfer limits into an EIM balancing authority area the same as any other internal constraint with regard to market power mitigation. As a result, the CAISO will test each EIM entity balancing authority area power balancing constraint for competitiveness whenever the constraint is binding. This will ensure consistent treatment of all

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[43] This matter was also recently discussed at a regional issues forum convened by stakeholders to consider issues associated with the Energy Imbalance Market. *See* Regional Issues Forum, meeting agenda, April 6, 2016. The CAISO believes that EIM stakeholders have the opportunity to decide whether this should be a priority item and, if so, to make their position known to the EIM Governing Body that will be seated shortly.

[44] *Cal. Indep. Sys. Operator Corp.*, 147 FERC ¶ 61,231, at P 218.

[45] *Id.* at PP 219-220; *see also* Informational Status Reports on Energy Imbalance Market Competiveness under ER14-1386, dated May 29, 2015 and January 1, 2016.

constraints in the EIM area. It will also obviate the need for a specific structural competitiveness assessment by the Department of Market Monitoring and authorization from the Commission.

The assessments performed with respect to PacifiCorp and NV Energy support applying market power mitigation of EIM transfer limits.[46] PacifiCorp and NV Energy own or control most, if not all, of the resources in their respective balancing authority areas that participate in the Energy Imbalance Market. Thus, the Department of Market Monitoring was unable to conclude that these balancing authority areas are structurally competitive. The CAISO expects similar findings with respect to future EIM entities, including Puget Sound Energy, Arizona Public Service Company, Portland General Electric Company, and Idaho Power Company. There is no need to continue performing an analysis and seeking authorization from the Commission to include EIM transfer constraints in the market power mitigation procedures when the logical conclusion will be to include them. Accordingly, the CAISO proposes always to include EIM transfers into every EIM entity balancing authority area to ensure that EIM internal interties will be mitigated whenever conditions warrant.[47]

The CAISO's Department of Market Monitoring supports treating these constraints the same as other constraints in the market power mitigation processes.[48] According to the Department of Market Monitoring, the EIM transfer constraints create isolated, local areas within the larger system in much the same way flow-based transmission constraints do. Therefore, when EIM transfer constraints bind and elevate prices in EIM balancing authority areas relative to the broader system, there is no legitimate reason not to subject constraints creating this price separation to the market power mitigation processes just like other constraints that create local price separation.[49] No stakeholders opposed this proposal, and a number stated their support.[50]

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46 *Cal. Indep. Sys. Operator Corp.*, 148 FERC ¶ 61,222 (2014); and *Cal. Indep. Sys. Operator Corp.*, 153 FERC ¶ 61,207 (2015).

47 The CAISO will continue to monitor the Energy Imbalance Market for competiveness and consider mitigation measures as appropriate. However, given that EIM entities own most of the generation in their balancing authority area and the proposal treats EIM transfer constraints into an EIM entity balancing authority area the same as any other internal constraint in the EIM area, the CAISO does not anticipate revisiting application of the market power mitigation procedures in the near future.

48 *See* Department of Market Monitoring comments at 3-4.

49 *See* Comments of Department of Market Monitoring.

50 *See* Comments of NV Energy, PacifiCorp, Pacific Gas and Electric Company,

G. Marginal Losses Calculation

In its order conditionally accepting the CAISO's Phase 1 enhancements, the Commission directed the CAISO to provide greater detail in Appendix C of its tariff to clarify that the marginal price of congestion in Energy Imbalance Market locational marginal prices will reflect the shadow price of all binding transmission constraints.[51] The Commission accepted the CAISO compliance filing on February 3, 2016.[52]

In preparing its compliance filing, the CAISO concluded that it would be appropriate to provide a similar level of detail regarding the marginal losses calculation for Energy Imbalance Market locational marginal prices. The CAISO could not propose such changes at that time because they were beyond the scope of the compliance filing. The CAISO therefore proposes to revise Appendix C in this filing to provide a commensurate level of detail regarding the calculation of marginal losses. The amendment represents no substantive change in the calculation, but merely provides greater transparency. The CAISO vetted this tariff language with stakeholders and responded to requests for additional information in that tariff development process.

IV. OTHER ISSUES CONSIDERED IN STAKEHOLDER PROCESS

During the stakeholder process, the CAISO and stakeholders considered a number of other potential enhancements for the Energy Imbalance Market. Although the CAISO is not proposing tariff revisions on these matters and they are beyond the scope of the instant tariff amendment, the CAISO will briefly discuss one of the issues given the interest of stakeholders and the Commission in the question of whether to include an EIM transmission charge in the Energy Imbalance Market.

At the initiation of the Energy Imbalance Market, the CAISO proposed and the Commission approved a reciprocal transmission charge as just and reasonable. The CAISO committed to commencing a stakeholder process within the first year of implementation to evaluate the need, if any, to adjust transmission charges for EIM transfers. The Issue Paper and Straw Proposal identified four alternative potential transmission service rates, for compensation for EIM's transmission support of EIM transfers, along with principles for comparison of the alternatives. The CAISO also invited proposals for additional

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and Southern California Edison Company.

51 *Cal. Indep. Sys. Operator Corp*., 153 FERC ¶ 61,087 at P 43 (2015).

52 Letter Order, Docket No. ER15-1919-004 (February 3, 2016).

analyses, and considered whether analyses proposed by stakeholders could be completed within the timeframe of this stakeholder process.

Stakeholder comments on the Issue Paper and Straw Proposal did not identify specific data items in addition to those identified by the CAISO (transmission usage from forward schedules versus EIM transfers, and the volume of forward scheduling before versus after EIM implementation), but some stakeholder comments suggested broader analyses of economic impacts of alternative transmission rate designs. As further operational experience through EIM becomes available, the CAISO will determine whether broad analyses of economic impacts are feasible and warranted. No stakeholder objected to the continuation of the current reciprocity arrangement and this approach has since been included in the open access transmission tariff amendments recently proposed by Puget Sound Energy and the Arizona Public Service Company.[53] The CAISO would engage all stakeholders in the event this question is considered in the future.[54]

V. EFFECTIVE DATE AND REQUEST FOR WAIVER

The CAISO requests the amendments be made effective on October 1, 2016. This is the date targeted for participation of two new entities in the Energy Imbalance Market and this will support their participation. The acceptance of these proposed changes and the implementation of the two EIM entities are not interdependent.[55] Therefore, the CAISO would expect that it would not be necessary to change the requested effective date in the event there were a change in the EIM entities' implementation date.

In addition, the CAISO would appreciate a ruling by the Commission prior to the beginning of market simulation on July 5. Market simulation is more productive, and the determination of readiness more accurate, if the rules under which the CAISO conducts it are the same, to the extent feasible, as those that will be in place when full participation of a new EIM Entity commences. The CAISO therefore respectfully requests that the Commission issue an order by July 1, 2016.

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53 *See* FERC Docket Nos. ER16-923 and ER16-938.

54 In connection with the potential expansion of the CAISO's full operations into states beyond California, the CAISO has initiated a stakeholder process to evaluate its transmission access charge. The CAISO anticipates that the discussions in this effort will be helpful to further consideration of any Energy Imbalance Market transmission charges.

55 The CAISO does not believe the proposed changes require any corollary changes in the EIM entities' OATTs.

The CAISO respectfully requests waiver of the Commission's notice requirement to permit the tariff changes contained in this filing to go into effect on October 1, 2016, as requested above. Specifically, pursuant to section 35.11 of the Commission's regulations (18 C.F.R. § 35.11), the CAISO requests waiver of the notice requirement contained in section 35.3 of the Commission's regulations (18 C.F.R. § 35.3) to allow the requested effective date since it is more than 120 days from the date of this filing.

VI. COMMUNICATIONS

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VII. SERVICE

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

VIII. CONTENTS OF FILING

In addition to this transmittal letter, this filing includes the following attachments:

Attachment A	Clean CAISO tariff sheets incorporating this tariff amendment
Attachment B	Red-lined document showing the revisions contained in this tariff amendment

Attachment C Draft Final Proposal

Attachment D Board Memorandum and Resolution

IX. CONCLUSION

For the reasons set forth in this filing, the CAISO respectfully requests that the Commission issue an order by July 1, 2016 that accepts the tariff revisions proposed in the filing effective as of October 1, 2016.

Respectfully submitted,

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Attachment A – Clean Tariff Records

Energy Imbalance Market Year One Enhancements – Phase 2

California Independent System Operator Corporation

April 28, 2016

11.5.4.1.1 Real-Time Congestion Offset.

(a) **Contribution to Marginal Cost of Congestion.** For each Settlement Period of the RTM, the CAISO shall calculate the contribution of each Balancing Authority Area in the EIM Area to the Marginal Cost of Congestion at each resource location and intertie in the EIM Area for each Balancing Authority Area based on the location of the Transmission Constraints in each Balancing Authority Area, EIM External Interties, and constraints enforced outside of the EIM Area needed to manage that Balancing Authority Area's responsibilities.

(b) **Real-Time Congestion Offset.** For each Settlement Period of the RTM, the CAISO shall calculate the Real-Time Congestion Offset for each Balancing Authority Area in the EIM Area as—

(1) the sum of the product of the contribution of that Balancing Authority Area as determined in subsection (a) of this section, the Marginal Cost of Congestion component of the Locational Marginal Price at each resource location in the EIM Area, and the imbalance energy at that resource location, including Virtual Bids at that resource location;

(2) minus any Virtual Bid adjustment as determined in accordance with section 11.5.4.1.1(d).

(c) **Treatment of EIM Internal Interties.**

(1) **Characterization of Transmission Rights.** As the terms are used for the purposes assigning congestion revenue to a Balancing Authority Area pursuant to section (c)(3), the CAISO or an EIM Entity provides—

(A) transmission "to" an EIM Internal Intertie if a transaction using that transmission must compete at that location with transactions using transmission that is not provided by the CAISO or an EIM Entity;

(B) transmission "through" an EIM Internal Intertie if a transaction using that transmission does not compete at that location with transactions using transmission that is not provided by the CAISO or an EIM Entity.

(2) **EIM Intertie that Operates Only as an EIM Internal Intertie.** In performing the calculation in subsection (a) of this section in the case of an EIM Intertie that operates only as an EIM Internal Intertie, the CAISO shall determine a Balancing Authority Area's contribution to the Congestion at the intertie by—

(A) dividing the congestion revenue equally to each side of the intertie as determined by the Balancing Authority Area boundary at that intertie; then

(B) allocating the congestion revenue divided in subsection (c)(2)(A) of this section to each side of the intertie among the Balancing Authority Areas that share that side of the intertie in proportion to the Balancing Authority Area's contribution to the EIM Transfer limit.

(3) **EIM Intertie that Operates Both as an EIM Internal Intertie and an EIM External Intertie or a Scheduling Point.** In performing the calculation in subsection (a) of this section in the case of an EIM Intertie that operates both as an EIM Internal Intertie and an EIM External Intertie or Scheduling Point, the CAISO shall determine a Balancing Authority Area's contribution to the Congestion at the intertie by—

(A) assigning congestion revenue attributable to a constraint at the EIM Internal Intertie associated with the CAISO's or an EIM Entity's provision of transmission to the EIM Internal Intertie to the Balancing Authority Areas in the EIM Area that provide transmission to the EIM Internal Intertie in proportion to each EIM Entity's contribution to the EIM Transfer limit;

(B) assigning congestion revenue attributable to a constraint at the EIM Internal Intertie associated with the CAISO's or an EIM Entity's provision of transmission through the EIM Internal Intertie to the Balancing Authority Areas in the EIM Area that provide transmission through the EIM Internal Intertie in accordance with the calculation in subsection

(c)(2) of this section; and

(C) assigning congestion revenue attributable to the EIM External Intertie or the Scheduling Point to the Balancing Authority Area in the EIM Area that manages the transmission rights on that intertie.

(4) **EIM Intertie that Operates Only as an EIM External Intertie.** In performing the calculation in subsection (a) of this section in the case of an EIM Intertie that operates only as an EIM External Intertie, the CAISO shall determine a Balancing Authority Area's contribution to the Congestion at the intertie by allocating the congestion revenue to the Balancing Authority Area in the EIM Area that manages the intertie.

(d) **Virtual Bid Adjustment.**

(1) **Individual Constraint Calculation.** For each Transmission Constraint in an EIM Entity Balancing Authority Area, the CAISO will calculate a Virtual Bid adjustment as the product of that Transmission Constraint's FMM Shadow Price and the lesser of-

(A) the Flow Impact of Virtual Bids and

(B) the Flow Impacts of all Day-Ahead Scheduled Energy and EIM Base Schedules less the Flow Impacts of FMM Schedules,

but not less than zero.

(2) **EIM Entity Balancing Authority Area Calculation.** Each EIM Entity Balancing Authority Area's Virtual Bid adjustment shall be the sum of the individual Transmission Constraint calculation for all Transmission Constraints within that EIM Entity Balancing Authority Area.

(e) **Allocation.** The CAISO will allocate-

(1) the Real-Time Congestion Offset for each EIM Entity Balancing Authority Area to the applicable EIM Entity Scheduling Coordinator;

(2) the Real-time Congestion Offset for the CAISO Balancing Authority Area in accordance with Section 11.5.4.2; and

(3) the Virtual Bid adjustment from each individual constraint calculation to each Scheduling Coordinator who submitted Virtual Bids based on that Scheduling Coordinator's Virtual Award's pro rata share of the gross positive Congestion revenues received by all Virtual Awards from that Transmission Constraint.

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29.9 Outages and Critical Contingencies.

(a) **Applicability of Section 9.** Section 9 shall not apply to EIM Market Participants except as referenced in Section 29.9.

(b) **Transmission Scheduled Outages.**

(1) **Responsibility.** The EIM Entity shall be responsible for performing engineering studies with regard to, and modeling and approving, Outages on transmission facilities for maintenance purposes within the EIM Entity Balancing Authority Area, including making any necessary arrangements for this purpose regarding the transmission capacity made available by an EIM Transmission Service Provider to the Real-Time Market.

(2) **Notice.** The EIM Entity Scheduling Coordinator shall submit notice of transmission Outages approved by the EIM Entity to the CAISO by the means set forth in the Business Practice Manual for the Energy Imbalance Market and at least seven Business Days prior the planned Outage.

(3) **Notice of Modification.** The EIM Entity Scheduling Coordinator may submit a notice of modification of an approved transmission Outage and any resulting updates to EIM Intertie limits to the CAISO by the means set forth in the Business Practice Manual for the Energy Imbalance Market and in accordance with the deadlines set forth in Section 9 and Section 29.9.

(4) **Contents of Notice.** The EIM Entity Scheduling Coordinator notices of approved transmission Outages shall include—

(A) the start and finish date for each Outage for maintenance purposes; and

(B) such information other than start and finish date as is required in Section 9.3.6 for transmission Operators seeking approval of Outages.

(c) **Generation Maintenance Outages.**

(1) **Responsibility.** The EIM Entity shall be responsible for performing engineering studies with regard to, and modeling and approving, Outages of EIM Resources and non-participating resources for maintenance purposes within the EIM Entity Balancing Authority Area.

(2) **Notice.** The EIM Entity Scheduling Coordinator shall submit notice of Outages of EIM Resources and non-participating resources approved by the EIM Entity to the CAISO by the means set forth in the Business Practice Manual for the Energy Imbalance Market and at least seven Business Days prior to the planned Outage.

(3) **Contents of Notice.** The EIM Entity Scheduling Coordinator notices of approved Outages of EIM Resources and non-participating resources shall include—

(A) the start and finish date for each Outage for maintenance purposes; and

(B) such information other than start and finish date as is required in Section 9.3.6 for Operators seeking approval of Generating Unit Outages.

(d) **Actions Regarding Scheduled Outages.**

(1) **CAISO Evaluation of Scheduled Outages.** The CAISO will implement the transmission and Generation Outages approved by the EIM Entity through the Day-Ahead Market process and will inform the EIM Entity Scheduling Coordinator of any anticipated overloads.

(2) **EIM Entity Action.** Based on the information provided by the CAISO to the EIM Entity Scheduling Coordinator, the EIM Entity shall take such action to adjust or cancel Outages as it determines to be necessary.

(3) **Notice to Reliability Coordinator.**

(A) **EIM Entity Responsibility.** The EIM Entity is responsible for informing the Reliability Coordinator of scheduled Outages.

(B) **CAISO Facilitation.** Upon request of an EIM Entity, and without assuming any liability, the CAISO will provide the Reliability Coordinator with Outage information submitted to the CAISO by the EIM Entity on behalf of the EIM Entity.

(e) **Forced Outages.** An EIM Entity Scheduling Coordinator shall comply with the reporting provisions of Section 9 with regard to Forced Outages of transmission facilities within the Balancing Authority Area of the EIM Entity it represents and an EIM Participating Resource Scheduling Coordinator shall comply with the reporting provisions of Section 9 with regard to Forced Outages of Generating Units it represents as EIM Resources.

(f) **Transmission Limits.** An EIM Entity Scheduling Coordinator must notify the CAISO by the means specified in the Business Practice Manual for the Energy Imbalance Market with respect to transmission limits on the transmission capacity made available to the Real-Time Market within the EIM Entity Balancing Authority Area that need to be enforced in the Real-Time Market, including—

(1) physical MVA or MW limits under base case and contingencies;

(2) scheduling limits for EIM Intertie transactions based on E-Tags; and

(3) contractual limits on Transmission Interfaces where the EIM Transmission Service Provider has transmission rights.

* * *

29.30 Bid and Self-Schedule Submission For CAISO Markets.

(a) In General. The provisions of Section 30 that are applicable to the Real-Time Market, as supplemented by Section 29.30, shall apply to EIM Market Participants.

(b) Start Up and Minimum Load. For the Proxy Cost determination of Start-Up Cost and Minimum Load Costs, the CAISO will utilize the Market Services Charge and System Operations Charge reflected in the EIM Administrative Charge.

(c) EIM Available Balancing Capacity Energy Bid Curve for EIM Participating

Resources. For each Trading Hour, the CAISO will apply Energy Bids submitted for EIM Participating Resources, which may be subject to mitigation pursuant to Section 29.39, towards the EIM Available Balancing Capacity as provided in Section 29.30(e).

(d) EIM Available Balancing Capacity Bids Used for EIM Available Balancing Capacity Served by Non-Participating Resources. The CAISO will create an Energy Bid Curve based on the Default Energy Bid established by the EIM Entity Scheduling Coordinator and the CAISO pursuant to Section 29.4(c)(4)(K) for all non-participating resources that the EIM Entity Scheduling Coordinator may identify as EIM Available Balancing Capacity, and will apply such bids to the EIM Available Balancing Capacity as provided in Section 29.30(e).

(e) Treatment of Energy Bid Curves for EIM Available Balancing Capacity. For each Trading Hour the CAISO will allocate the categories of the EIM Resource Plan specified in Section 29.34(e)(3)(C) and (D) as follows.

(1) Upward Capacity. For upward capacity above the EIM Base Schedule, the CAISO will-

(A) allocate the Spinning and Non-Spinning Reserves down from the upper regulating limit as registered in the Master File, taking into account any PMax rerates; and then

(B) allocate EIM Upward Available Balancing Capacity to the Energy Bid Curve starting at the highest value of the Energy Bid Curve that does not overlap with Spinning or Non-Spinning Reserves.

(2) Downward Capacity. For downward capacity below the EIM Base Schedule, the CAISO will allocate EIM Downward Available Balancing Capacity to the Energy Bid Curve starting at its lowest value, taking into account any PMin rerates.

(3) Remaining Capacity. The CAISO will use any remaining portion of the Energy Bid Curve after the allocations in Section 29.30(e)(1) and 29.30(e)(2) for Dispatch under any condition, except that for non-participating resources the CAISO will adjust the EIM Upward Available Balancing Capacity and EIM

Downward Available Balancing Capacity towards the EIM Base Schedule so that there will not be any remaining capacity for Dispatch.

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29.34 EIM Operations

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(f) **Real-Time EIM Base Schedules.**

(1) **In General.**

(A) **Initial Submission.** EIM Entity Scheduling Coordinators, EIM Participating Resource Scheduling Coordinators, and non-participating resources in the EIM Entity Balancing Authority Area that wish to submit real-time hourly EIM Base Schedules, or, with regard to non-participating resources, wish to submit EIM Base Schedule information pursuant to Section 29.34(f)(4), must submit such schedules or other information consistent with the requirements of the Business Practice Manual for the Energy Imbalance Market and at least 75 minutes before the start of the Operating Hour.

(B) **Interim Revisions.** EIM Entity Scheduling Coordinators, EIM Participating Resource Scheduling Coordinators, and non-participating resources in the EIM Entity Balancing Authority Area may revise hourly Real-Time EIM Base Schedules, or, with regard to non-participating resources, revise EIM Base Schedule information submitted pursuant to Section 29.34(f)(4), meeting the requirements of the Business Practice Manual for the Energy Imbalance Market at or before 55 minutes before the start of the Operating Hour.

(C) **Final Revision.** EIM Entity Scheduling Coordinators may further revise hourly Real-Time EIM Base Schedules, including EIM Base Schedules

for EIM Participating Resources, at or before 40 minutes before the start of the Operating Hour.

(2) **EIM Base Schedule for EIM Participating Resources.** The EIM Base Schedule for each EIM Participating Resource must be within the Economic Bid range of the submitted Energy Bids for each Operating Hour for EIM Resources, which the CAISO will make available to the EIM Entity without price information.

(3) **EIM Base Schedule for Imports and Exports.** EIM Base Schedules must—

(A) disaggregate Day-Ahead import/export schedules between the EIM Entity Balancing Authority Area and the CAISO Balancing Authority Area;

(B) identify the relevant EIM Interties for imports and exports to an EIM Entity Balancing Authority Area from Balancing Authority Areas other than the CAISO Balancing Authority Area; and

(C) include approved, pending, and adjusted e-tags for imports and exports.

(4) **EIM Base Schedule Aggregation.** In response to a request by an EIM Entity Scheduling Coordinator, the CAISO will establish an electronic interface by which non-participating resources, Loads, and other customers of the EIM Entity may submit EIM Base Schedule information to the EIM Scheduling Coordinator and the CAISO.

* * *

i) **Interchange Schedules with Other Balancing Authorities.**

(1) **In General.** EIM Entity Scheduling Coordinators must submit Interchange Schedules with other Balancing Authority Areas at the relevant EIM Interties and must update these Interchange Schedules with any adjustments, when applicable, as part of the hourly EIM Resource Plan revision.

(2) **Economic Bidding of EIM Intertie Transactions.** An EIM Participating Resource Scheduling Coordinator may bid a transaction at an EIM External Intertie into the FMM if—

(A) the EIM Entity supports economic bidding of EIM External Intertie transactions;

(B) the relevant transmission service providers or path operators support 15-minute scheduling at the EIM External Intertie under FERC Order No. 764; and

(C) the CAISO has identified, developed, and implemented market rules necessary to enable such intertie bidding.

* * *

29.39 EIM Market Power Mitigation.

(a) **EIM Market Power Mitigation Procedure.** The CAISO shall apply the Real-Time Local Market Power Mitigation procedure in Section 39.7 to the Energy Imbalance Market, including EIM Transfer constraints into an EIM Entity Balancing Authority Area on an EIM Internal Intertie, except as provided in Section 29.39.

(b) **Competitive Path Assessment.** The CAISO shall conduct the competitive path assessment to determine for each EIM Entity Balancing Authority Area whether a path is competitive or non-competitive, consistent with Section 39.7.2, except that—

(1) EIM Participating Resource Scheduling Coordinators shall submit information required by the CAISO to perform the competitive path assessment;

(2) the competitive path assessment shall not exclude EIM Participating Resources from the test used to determine the competitiveness of Transmission Constraints on the basis that they may be net buyers of Energy in the Real-Time Market; and

(3) the CAISO may establish different Reference Buses for each Balancing Authority Area, which need not be within the Balancing Authority Area, for calculating the LMP decomposition which is used to trigger Bid mitigation, based on the topology of each Balancing Authority Area and consideration of the bus at which the Marginal Cost of Congestion component of Locational Marginal Prices is least influenced by market power.

(c) **Locational Marginal Price Decomposition.** The CAISO shall perform the Locational Marginal Price decomposition for each EIM Entity Balancing Authority Area using the results of the competitive path assessment and the Congestion pricing results of the pre-market run to determine which resources may have local market power due to Congestion on a non-competitive Transmission Constraint, consistent with Section 34.2.3 and 39.7.

(d) **Default Energy Bids.** The CAISO shall use the methods and standards set forth in Section 39.7 to determine Default Energy Bids for EIM Participating Resources, except that the CAISO will use the Market Services Charge and System Operations Charge reflected in the EIM Administrative Charge.

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Appendix C

Locational Marginal Price

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E. Marginal Losses Component Calculation

The CAISO calculates the Marginal Cost of Losses (MCL_i) at each bus *i* as described in Section 27.1.1.2. The MCL component of the LMP at any bus *i* within the CAISO's Balancing Authority Area is calculated in the Day-Ahead Market and the Real-Time Market using the equation:

$$MCL_i = MLF_i * SMEC_r$$

The MCL component of the LMP at any bus *i* within an EIM Balancing Authority Area is calculated in the Real-Time Market using the equation:

$$MCL_i = MLF_i * (SMEC_r + \lambda_j - \psi)$$

Where:

- MLFi (the marginal loss factor for PNode i to the system Reference Bus) = $- \partial L/\partial G_i$,

Where:

L = system losses,

G*i* = generation injected at PNode *i*, and

$\partial L/\partial G_i$ is the partial derivative of system losses with respect to generation injection at bus *i*;

- λ_j = the shadow price of the power balance constraint for the Balancing Authority Area in which the bus is located; and
- ψ = the shadow price of the EIM export allocation constraint.

Attachment B – Marked Tariff Records

Energy Imbalance Market Year One Enhancements – Phase 2

California Independent System Operator Corporation

April 28, 2016

11.5.4.1.1 Real-Time Congestion Offset.

(a) **Contribution to Marginal Cost of Congestion.** For each Settlement Period of the RTM, the CAISO shall calculate the contribution of each Balancing Authority Area in the EIM Area to the Marginal Cost of Congestion at each resource location and intertie in the EIM Area for each Balancing Authority Area based on the location of the Transmission Constraints in each Balancing Authority Area, EIM External Interties, and constraints enforced outside of the EIM Area needed to manage that Balancing Authority Area's responsibilities.

(~~a~~b) **Real-Time Congestion Offset.** For each Settlement Period of the RTM, the CAISO shall calculate the Real-Time Congestion Offset for each Balancing Authority Area in the EIM Area as—

(1) the sum ~~for each Balancing Authority Area in the EIM Area~~ of the product of the contribution of that Balancing Authority Area~~'s Transmission Constraints, inclusive of internal constraints, EIM External Interties and constraints enforced outside of the EIM Area needed to manage EIM Transfers of the Balancing Authority Area,~~ as determined in subsection (a) of this section, ~~to~~ the Marginal Cost of Congestion ~~marginal Congestion~~ component of the Locational Marginal Price at each resource location in the EIM Area, and the imbalance energy at that resource location, including Virtual Bids~~,~~ at that resource location;

(2) minus any Virtual Bid adjustment as determined in accordance with section 11.5.4.1.1(d).

(~~b~~c) **Treatment of EIM Internal Interties.**

(1) **Characterization of Transmission Rights.** As the terms are used for the purposes assigning congestion revenue to a Balancing Authority Area pursuant to section (c)(3), the CAISO or an EIM Entity provides—

(A) transmission "to" an EIM Internal Intertie if a transaction using that transmission must compete at that location with transactions using transmission that is not provided by the CAISO or an EIM Entity;

(B) transmission "through" an EIM Internal Intertie if a transaction using that transmission does not compete at that location with transactions using transmission that is not provided by the CAISO or an EIM Entity.

(2) **EIM Intertie that Operates Only as an EIM Internal Intertie.** In performing the calculation in subsection (a)~~(1)~~ of this section in the case of an EIM Intertie that operates only as an EIM Internal Intertie, the CAISO shall determine a Balancing Authority Area's contribution ~~at EIM Internal Interties~~to the Congestion at the intertie by—

(A) dividing the congestion revenue equally to each side of the intertie as determined by the Balancing Authority Area boundary at that intertie; then

(B) allocating the congestion revenue divided in subsection (c)(~~1~~2)(A) of this section to each side of the intertie among ~~based on~~ the ~~number of~~ Balancing Authority Areas that share that side of the ~~EIM Internal I~~intertie in proportion to the Balancing Authority Area's contribution to the EIM Transfer limit ~~as provided in the Business Practice Manual for the Energy Imbalance Market~~.

(3) **EIM Intertie that Operates Both as an EIM Internal Intertie and an EIM External Intertie or a Scheduling Point.** In performing the calculation in subsection (a) of this section in the case of an EIM Intertie that operates both as an EIM Internal Intertie and an EIM External Intertie or Scheduling Point, the CAISO shall determine a Balancing Authority Area's contribution to the Congestion at the intertie by—

(A) assigning congestion revenue attributable to a constraint at the EIM Internal Intertie associated with the CAISO's or an EIM Entity's provision of transmission to the EIM Internal Intertie to the Balancing Authority Areas in the EIM Area that provide transmission to the EIM Internal Intertie in proportion to each EIM Entity's contribution to the EIM Transfer

limit;

(B) assigning congestion revenue attributable to a constraint at the EIM Internal Intertie associated with the CAISO's or an EIM Entity's provision of transmission through the EIM Internal Intertie to the Balancing Authority Areas in the EIM Area that provide transmission through the EIM Internal Intertie in accordance with the calculation in subsection (c)(2) of this section; and

(C) assigning congestion revenue attributable to the EIM External Intertie or the Scheduling Point to the Balancing Authority Area in the EIM Area that manages the transmission rights on that intertie.

(4) **EIM Intertie that Operates Only as an EIM External Intertie.** In performing the calculation in subsection (a) of this section in the case of an EIM Intertie that operates only as an EIM External Intertie, the CAISO shall determine a Balancing Authority Area's contribution to the Congestion at the intertie by allocating the congestion revenue to the Balancing Authority Area in the EIM Area that manages the intertie.

(~~e~~d) **Virtual Bid Adjustment.**

(1) **Individual Constraint Calculation.** For each Transmission Constraint in an EIM Entity Balancing Authority Area, the CAISO will calculate a Virtual Bid adjustment as the product of that Transmission Constraint's FMM Shadow Price and the lesser of-

(A) the Flow Impact of Virtual Bids and

(B) the Flow Impacts of all Day-Ahead Scheduled Energy and EIM Base Schedules less the Flow Impacts of FMM Schedules,

but not less than zero.

(2) **EIM Entity Balancing Authority Area Calculation.** Each EIM Entity Balancing Authority Area's Virtual Bid adjustment shall be the sum of the individual Transmission Constraint calculation for all Transmission Constraints within that

EIM Entity Balancing Authority Area.

(~~d~~e) **Allocation.** The CAISO will allocate-

(1) the Real-Time Congestion Offset for each EIM Entity Balancing Authority Area to the applicable EIM Entity Scheduling Coordinator;

(2) the Real-time Congestion Offset for the CAISO Balancing Authority Area in accordance with Section 11.5.4.2; and

(3) the Virtual Bid adjustment from each individual constraint calculation to each Scheduling Coordinator who submitted Virtual Bids based on that Scheduling Coordinator's Virtual Award's pro rata share of the gross positive Congestion revenues received by all Virtual Awards from that Transmission Constraint.

* * *

29.9 Outages and Critical Contingencies.

(a) **Applicability of Section 9.** Section 9 shall not apply to EIM Market Participants except as referenced in Section 29.9.

(b) **Transmission Scheduled Outages.**

(1) **Responsibility.** The EIM Entity shall be responsible for performing engineering studies with regard to, and modeling and approving, Outages on transmission facilities for maintenance purposes within the EIM Entity Balancing Authority Area, including making any necessary arrangements for this purpose regarding the transmission capacity made available by an EIM Transmission Service Provider to the Real-Time Market.

(2) **Notice.** The EIM Entity Scheduling Coordinator shall submit notice of transmission Outages approved by the EIM Entity to the CAISO by the means set forth in the Business Practice Manual for the Energy Imbalance Market and at least seven Business Days prior the planned Outage.

(3) **Notice of Modification.** The EIM Entity Scheduling Coordinator may submit a notice of modification of an approved transmission Outage and any resulting

updates to EIM Intertie limits to the CAISO by the means set forth in the Business Practice Manual for the Energy Imbalance Market and in accordance with the deadlines set forth in Section 9 and Section 29.9.

(4) **Contents of Notice.** The EIM Entity Scheduling Coordinator notices of approved transmission Outages shall include—

(A) the start and finish date for each Outage for maintenance purposes; and

(B) such information other than start and finish date as is required in Section 9.3.6 for transmission Operators seeking approval of Outages.

(c) **Generation Maintenance Outages.**

(1) **Responsibility.** The EIM Entity shall be responsible for performing engineering studies with regard to, and modeling and approving, Outages of EIM Resources and non-participating resources for maintenance purposes within the EIM Entity Balancing Authority Area.

(2) **Notice.** The EIM Entity Scheduling Coordinator shall submit notice of Outages of EIM Resources and non-participating resources approved by the EIM Entity to the CAISO by the means set forth in the Business Practice Manual for the Energy Imbalance Market and at least seven Business Days prior to the planned Outage.

(3) **Contents of Notice.** The EIM Entity Scheduling Coordinator notices of approved Outages of EIM Resources and non-participating resources shall include—

(A) the start and finish date for each Outage for maintenance purposes; and

(B) such information other than start and finish date as is required in Section 9.3.6 for Operators seeking approval of Generating Unit Outages.

(d) **Actions Regarding Scheduled Outages.**

(1) **CAISO Evaluation of Scheduled Outages.** The CAISO will implement the transmission and Generation Outages approved by the EIM Entity through the Day-Ahead Market process and will inform the EIM Entity Scheduling Coordinator of any anticipated overloads.

(2) **EIM Entity Action.** Based on the information provided by the CAISO to the EIM Entity Scheduling Coordinator, the EIM Entity shall take such action to adjust or cancel Outages as it determines to be necessary ~~and inform the Reliability Coordinator~~.

(3) **Notice to Reliability Coordinator.**

(A) **EIM Entity Responsibility.** The EIM Entity is responsible for informing the Reliability Coordinator of scheduled Outages.

(B) **CAISO Facilitation.** Upon request of an EIM Entity, and without assuming any liability, the CAISO will provide the Reliability Coordinator with Outage information submitted to the CAISO by the EIM Entity on behalf of the EIM Entity.

(e) **Forced Outages.** An EIM Entity Scheduling Coordinator shall comply with the reporting provisions of Section 9 with regard to Forced Outages of transmission facilities within the Balancing Authority Area of the EIM Entity it represents and an EIM Participating Resource Scheduling Coordinator shall comply with the reporting provisions of Section 9 with regard to Forced Outages of Generating Units it represents as EIM Resources.

(f) **Transmission Limits.** An EIM Entity Scheduling Coordinator must notify the CAISO by the means specified in the Business Practice Manual for the Energy Imbalance Market with respect to transmission limits on the transmission capacity made available to the Real-Time Market within the EIM Entity Balancing Authority Area that need to be enforced in the Real-Time Market, including—

(1) physical MVA or MW limits under base case and contingencies;

(2) scheduling limits for EIM Intertie transactions based on E-Tags; and

(3) contractual limits on Transmission Interfaces where the EIM Transmission Service Provider has transmission rights.

* * *

29.30 Bid and Self-Schedule Submission For CAISO Markets.

(a) **In General.** The provisions of Section 30 that are applicable to the Real-Time Market, as supplemented by Section 29.30, shall apply to EIM Market Participants.

(b) ~~**Transition Cost Multiplier.** EIM Participating Resources that are also Multi-Stage Generating Resources may negotiate a Transition Cost multiplier with the CAISO, in consultation with Department of Market Monitoring, consistent with the procedures in Section 39.7.1.3 in the event that the monthly Thousand British Thermal Units (MMBtu) Gas Price Index used in Section 30.4.2 does not account for the fuel source of the Generating Unit.~~**Start Up and Minimum Load.** For the Proxy Cost determination of Start-Up Cost and Minimum Load Costs, the CAISO will utilize the Market Services Charge and System Operations Charge reflected in the EIM Administrative Charge.

(c) **EIM Available Balancing Capacity Energy Bid Curve for EIM Participating Resources.** For each Trading Hour, the CAISO will apply Energy Bids submitted for EIM Participating Resources, which may be subject to mitigation pursuant to Section 29.39, towards the EIM Available Balancing Capacity as provided in Section 29.30(e).

(d) **EIM Available Balancing Capacity Bids Used for EIM Available Balancing Capacity Served by Non-Participating Resources.** The CAISO will create an Energy Bid Curve based on the Default Energy Bid established by the EIM Entity Scheduling Coordinator and the CAISO pursuant to Section 29.4(c)(4)(K) for all non-participating resources that the EIM Entity Scheduling Coordinator may identify as EIM Available Balancing Capacity, and will apply such bids to the EIM Available Balancing Capacity as provided in Section 29.30(e).

(e) **Treatment of Energy Bid Curves for EIM Available Balancing Capacity.** For each Trading Hour the CAISO will allocate the categories of the EIM Resource Plan specified in Section 29.34(e)(3)(C) and (D) as follows.

(1) **Upward Capacity.** For upward capacity above the EIM Base Schedule, the CAISO will-

(A) allocate the Spinning and Non-Spinning Reserves down from the upper

regulating limit as registered in the Master File, taking into account any PMax rerates; and then

(B) allocate EIM Upward Available Balancing Capacity to the Energy Bid Curve starting at the highest value of the Energy Bid Curve that does not overlap with Spinning or Non-Spinning Reserves.

(2) Downward Capacity. For downward capacity below the EIM Base Schedule, the CAISO will allocate EIM Downward Available Balancing Capacity to the Energy Bid Curve starting at its lowest value, taking into account any PMin rerates.

(3) Remaining Capacity. The CAISO will use any remaining portion of the Energy Bid Curve after the allocations in Section 29.30(e)(1) and 29.30(e)(2) for Dispatch under any condition, except that for non-participating resources the CAISO will adjust the EIM Upward Available Balancing Capacity and EIM Downward Available Balancing Capacity towards the EIM Base Schedule so that there will not be any remaining capacity for Dispatch.

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29.34 EIM Operations

* * *

(f) **Real-Time EIM Base Schedules.**

(1) **In General.**

(A) **Initial Submission.** EIM Entity Scheduling Coordinators, EIM Participating Resource Scheduling Coordinators, and non-participating resources in the EIM Entity Balancing Authority Area that wish to submit real-time hourly EIM Base Schedules, or, with regard to non-participating resources, wish to submit EIM Base Schedule information pursuant to Section 29.34(f)(4), must submit such schedules or other information consistent with the requirements of the Business Practice Manual for the

Energy Imbalance Market and at least 75 minutes before the start of the Operating Hour.

(B) **Interim Revisions.** EIM Entity Scheduling Coordinators, EIM Participating Resource Scheduling Coordinators, and non-participating resources in the EIM Entity Balancing Authority Area may revise hourly Real-Time EIM Base Schedules, or, with regard to non-participating resources, revise EIM Base Schedule information submitted pursuant to Section 29.34(f)(4), meeting the requirements of the Business Practice Manual for the Energy Imbalance Market at or before 55 minutes before the start of the Operating Hour.

(C) **Final Revision.** EIM Entity Scheduling Coordinators may further revise hourly Real-Time EIM Base Schedules, including EIM Base Schedules for EIM Participating Resources, at or before 40 minutes before the start of the Operating Hour.

(2) **EIM Base Schedule for EIM Participating Resources.** The EIM Base Schedule for each EIM Participating Resource must be within the Economic Bid range of the submitted Energy Bids for each Operating Hour for EIM Resources, which the CAISO will make available to the EIM Entity without price information.

(3) **EIM Base Schedule for Imports and Exports.** EIM Base Schedules must—

(A) disaggregate Day-Ahead import/export schedules between the EIM Entity Balancing Authority Area and the CAISO Balancing Authority Area~~,~~;

~~disaggregate the forward export schedules to other Balancing Authority Areas,~~

(B) ~~and~~ identify the relevant EIM Interties for imports and exports to an EIM Entity Balancing Authority Area from Balancing Authority Areas other than the CAISO Balancing Authority Area; and

(C) include approved, pending, and adjusted e-tags for imports and exports.

(4) **EIM Base Schedule Aggregation.** In response to a request by an EIM Entity

Scheduling Coordinator, the CAISO will establish an electronic interface by which non-participating resources, Loads, and other customers of the EIM Entity may submit EIM Base Schedule information to the EIM Scheduling Coordinator and the CAISO.

* * *

i) **Interchange Schedules with Other Balancing Authorities.**

(1) **In General.** EIM Entity Scheduling Coordinators must submit Interchange Schedules with other Balancing Authority Areas at the relevant EIM Interties and must update these Interchange Schedules with any adjustments, when applicable, as part of the hourly EIM Resource Plan revision.

(2) **Economic Bidding of EIM Intertie Transactions.** An EIM Participating Resource Scheduling Coordinator may bid a transaction at an EIM External Intertie into the FMM if—

(A) the EIM Entity supports economic bidding of EIM External Intertie transactions;

(B) ~~and~~ the relevant transmission service providers or path operators support 15-minute scheduling at the EIM External Intertie under FERC Order No. 764; and

(C) the CAISO has identified, developed, and implemented market rules necessary to enable such intertie bidding.

* * *

29.39 EIM Market Power Mitigation.

(a) **EIM Market Power Mitigation Procedure.** The CAISO shall apply the Real-Time Local Market Power Mitigation procedure in Section 39.7 to the Energy Imbalance Market, including EIM Transfer constraints into an EIM Entity Balancing Authority Area on an EIM Internal Intertie, except as provided in Section 29.39.

(b) **Competitive Path Assessment.** The CAISO shall conduct the competitive path assessment to determine for each EIM Entity Balancing Authority Area whether a path is competitive or non-competitive, consistent with Section 39.7.2, except that—

(1) EIM Participating Resource Scheduling Coordinators shall submit information required by the CAISO to perform the competitive path assessment;

(2) the competitive path assessment shall not exclude EIM Participating Resources from the test used to determine the competitiveness of Transmission Constraints on the basis that they may be net buyers of Energy in the Real-Time Market; and

(3) the CAISO may establish different Reference Buses for each Balancing Authority Area, which need not be within the Balancing Authority Area, for calculating the LMP decomposition which is used to trigger Bid mitigation, based on the topology of each Balancing Authority Area and consideration of the bus at which the Marginal Cost of Congestion component of Locational Marginal Prices is least influenced by market power.

(c) **Locational Marginal Price Decomposition.** The CAISO shall perform the Locational Marginal Price decomposition for each EIM Entity Balancing Authority Area using the results of the competitive path assessment and the Congestion pricing results of the pre-market run to determine which resources may have local market power due to Congestion on a non-competitive Transmission Constraint, consistent with Section 34.2.3 and 39.7.~~, except that—~~

~~(1) the CAISO will not mitigate resource Bids for scheduling limit constraints with Balancing Authority Areas that do not participate in the Real-Time Market;~~

~~(2) the Locational Marginal Price decomposition shall only be triggered if the resource is effective at relieving an uncompetitive constraint within the same Balancing Authority Area in which the resource is located except as described in Section 29.39(d);~~

(3) EIM Resources shall be mitigated to relieve congestion on uncompetitive constraints within the same Balancing Authority Area in which the EIM Resources are located except as described in Section 29.39(d); and

(d) **Market Power Mitigation of EIM Transfer Constraints.**

(1) **Structural Competiveness Assessment.** The Department of Market Monitoring may conduct a structural competitiveness assessment of an individual or group of entities within an EIM Entity Balancing Authority Area prior to or subsequent to the EIM Implementation Date for the EIM Entity to evaluate market power based on factors which may include:

(A) the Demand for Real-Time Imbalance Energy within the EIM Entity Balancing Authority Area;

(B) the Supply owned or controlled by different entities with the EIM Entity Balancing Authority Area; and

(C) the potential Supply available to the EIM Entity Balancing Authority Area from EIM Transfers.

(2) **Application of Market Power Mitigation.** The Department of Market Monitoring may include EIM Transfer constraints into an EIM Entity Balancing Authority Area on an EIM Internal Intertie in the Local Market Power Mitigation procedures under Section 39.7 if the CAISO determines that market power may exist based on a structural competitiveness assessment pursuant to Section 29.39(d)(1) and the FERC accepts a filing by the CAISO to implement such inclusion, and the Department of Market Monitoring may exclude the EIM Transfer constraints into an EIM Entity Balancing Authority Area on an EIM Internal Intertie from Local Market Power Mitigation if it determines that market power no longer exists based on a structural competitiveness assessment pursuant to Section

~~29.39(d)(1) and the FERC accepts a filing by the CAISO to implement the exclusion.~~

(d~~e~~) **Default Energy Bids.** The CAISO shall use the methods and standards set forth in Section 39.7 to determine Default Energy Bids for EIM Participating Resources, except that the CAISO will use the Market Services Charge and System Operations Charge reflected in the EIM Administrative Charge.

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Appendix C

Locational Marginal Price

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E. Marginal Losses Component Calculation

The CAISO calculates the Marginal Cost of Losses (MCL_i) at each bus *i* as described in Section 27.1.1.2. The MCL component of the LMP at any bus *i* within the CAISO's Balancing Authority Area is calculated in the Day-Ahead Market and the Real-Time Market using the equation:

$$MCL_i = MLF_i * SMEC_r$$

The MCL component of the LMP at any bus *i* within an EIM Balancing Authority Area is calculated in the Real-Time Market using the equation:

$$MCL_i = MLF_i * (SMEC_r + \lambda_j - \psi)$$

Where:

- MLFi ~~is~~ (the marginal loss factor for PNode i to the system Reference Bus) $= - \partial L / \partial G_i$,

  ~~based on an AC power flow solution. The marginal loss factor at a PNode is the incremental change in the quantity (MW) of transmission losses in the network resulting when serving an increment of Load at the PNode from the Reference Bus.~~

~~○ MLFi is equal to 1 - ∂L/∂G*i*, w~~Where:

L ~~=is~~ system losses,

G*i* ~~= is "~~generation inject~~ed~~ion~~"~~ at PNode *i*, and

$\partial L/\partial G_i$ is the partial derivative of system losses with respect to generation injection at bus *i*~~,~~;

~~that is, the incremental change in system losses associated with an incremental change in the generation injections at bus *i* holding constant other injection and withdrawals at all buses other than the Reference Bus and bus *i*.~~

~~SMECr is the SMEC at the Reference Bus, r.~~

- λ_i = the shadow price of the power balance constraint for the Balancing Authority Area in which the bus is located; and
- ψ = the shadow price of the EIM export allocation constraint.

Attachment C – Draft Final Proposal

Energy Imbalance Market Year One Enhancements – Phase 2

California Independent System Operator Corporation

April 28, 2016

Energy Imbalance Market
Year 1 Enhancements
Phase 2

Draft Final Proposal

September 8, 2015

Energy Imbalance Market Year 1 Enhancements
Phase 2 Draft Final Proposal

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1 Introduction

The Energy Imbalance Market (EIM) is a real-time market to dispatch economic bids voluntarily offered by participating resources to efficiently balance supply, transfers between balancing authority areas (BAA), and load across its footprint. The EIM extends the ISO's real-time market and leverages the FERC Order No. 764 market design changes implemented in May 2014. As such, the EIM includes a fifteen-minute market and five-minute real-time dispatch across the combined network of the ISO and EIM entities.

The EIM Year 1 Enhancements initiative includes proposed design changes to address FERC compliance, commitments made during the original stakeholder process, and to address other issues identified during implementation. The initiative has two phases. The first phase addressed design changes to be implemented when NV Energy joins the EIM in October 2015. These items were approved by the Board in March 2015 and are currently pending in FERC Docket No. ER15-1919. The second phase was to address items that benefit from six months of operational experience with the EIM and items from phase 1 that required additional discussion.

The following lists the items currently being addressed in phase 2.

Items for Board decision in November

EIM transfer congestion rent treatment – Currently, the EIM design splits the congestion rents equally between two EIM BAAs for EIM transfer constraints. The proposed change addresses the situation where the EIM transfer limits and the intertie scheduling limit are not the same. In this situation, the EIM transfer limit located in one EIM BAA and the intertie scheduling limit will be located in another BAA in the EIM will each receive 100% of the congestion rents in its BAA.

Dynamic competitive assessment for market power mitigation of EIM transfer limits – In the EIM Go-Live Enhancements, the ISO committed to look at an additional dynamic trigger for including EIM transfer constraints into an EIM BAA in the market power mitigation process. For example, if EIM transfer capability into an EIM BAA exceeds the historical imbalance needs of the EIM BAA, then in those hours the EIM transfer constraints could be excluded from the market power mitigation process. The ISO proposes to that limits on EIM transfers into an EIM BAA be subject to market power mitigation process the same as any other internal constraint.

Outage reporting to Peak Reliability Coordinator – Currently, an EIM entity must use the ISO Outage Management System (OMS) to enter approved outages within its BAA. Each BAA is responsible for submitting outage information into the Peak Reliability Coordinator (RC) outage application. The ISO proposes to allow the EIM entity to permit the ISO to submit outage information the entity has entered into OMS to Peak RC.

Standard base schedule treatment for e-Tags – During discussion with PacifiCorp and NV Energy, the ISO discovered the need to specify how base schedules should be

established for imports/exports. This decision cannot be at the discretion of the EIM entity, because a base schedule import for one BAA is a base schedule export for the other BAA. Therefore, the ISO has proposed to require EIM entities to include approved, pending, and adjusted e-Tags as valid means to communicate an import/export base schedule to an EIM entity for purposes of imbalance settlement.

Items that will be monitored to determine if a stakeholder initiative should commence

Potential EIM-wide transmission rate – The ISO committed to begin a review of a potential transmission charge once it had six months of operational data. Potential approaches were discussed in the original EIM stakeholder process in 2013. This document references material from the original stakeholder process and presents the current status. The ISO does not propose to change the structure of transmission rates at this time, and will continue to monitor the analysis discussed below and if needed will commence a new stakeholder process to review the alternatives.

Flow entitlements for base schedules/day-ahead schedules – The ISO committed to evaluate adding this functionality if there is a material impact on the constraints within a BAA in the EIM footprint from other EIM BAAs or the ISO. Currently, the real-time congestion offset is allocated based solely upon where the constraint is located. This design change would allocate a portion of a BAA's real-time congestion offset to other BAAs in the EIM footprint if the other EIM BAA's base schedule flows exceed agreed upon flow entitlements. The ISO does not propose to add flow entitlements to the EIM design and will continue to monitor the analysis discussed below.

Compensation for third parties making capacity available for EIM transfers – The ISO believes that the EIM transfer cost approach could be expanded to allow third party transmission owners to make available incremental transmission to support transfers. The incremental transmission would increase the transfer capability between BAAs in the EIM footprint. The ISO proposes to continue this discussion as part of the potential EIM-wide transmission rate design discussion or if needed to support a new EIM entity joining the EIM.

Items to be discussed in a separate stakeholder initiative

Long-term greenhouse gas (GHG) design change – Several stakeholders requested that the ISO evaluate long-term design changes that may require changes in California Air Resources Board (CARB) regulations. The need for a potential long-term design change could arise if EIM transfers into the ISO BAA are limited by the number of EIM participating resources willing to be deemed delivered to the ISO through their GHG bids. The ISO plans to begin a stakeholder initiative later this year to evaluate if the current EIM methodology to reimburse generation outside California for the portion of their output that is deemed delivered to the ISO BAA needs to be modified should PacifiCorp become a participating transmission owner. As a participating transmission owner, all of PacifiCorp's load and generation will clear in the day-ahead market and become part of the ISO BAA.

Bidding rules on external EIM interties – Currently, the EIM design allows full discretion to the EIM entity as to whether real-time economic bidding is allowed on intertie scheduling points with BAAs outside the EIM footprint. The ISO plans to hold a stakeholder workshop in Q4'15 to discuss the liquidity in the 15-minute market on the ISO intertie scheduling points. This will allow potential issue that are impacting liquidity to be addressed which will increase the benefits of 15-mintue bidding across the EIM footprint. In addition, the ISO will be commencing a stakeholder initiative as part of the PacifiCorp integration activities to complete the full network model implementation on ISO intertie scheduling points.

2 Plan for Stakeholder Engagement

Stakeholder input is essential and critical for the success of new initiatives from policy development to implementation. The EIM Year 1 Enhancements stakeholder process will shape the market design and policies through a series of proposals, meetings and written stakeholder comments. Stakeholders should submit comments to EIM@caiso.com. Table 1 below lists the planned schedule for the EIM Year 1 Enhancements Phase 2 stakeholder initiative.

The ISO is committed to providing ample opportunity for stakeholder input into our market design, policy development, and implementation activities.

This initiative assumes a basic understanding on the EIM design which went live on November 1, 2014. Please review the EIM Draft Final Proposal for additional information on the EIM design including: definitions, policy decisions, as well as descriptions of EIM design components such as the resource sufficiency evaluation and EIM settlements. The EIM Draft Final Proposal is posted at http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyImbalanceMarket.aspx.

Item	Date
Post Draft Final Proposal	September 4, 2015
Stakeholder Conference Call	September 14, 2015
Stakeholder Comments Due	September 22, 2015
Board of Governors Decision	November 5-6, 2015

Table 1 - Schedule for EIM Year 1 Enhancements Phase 2 Stakeholder Initiative

3 Changes to Issue Paper and Straw Proposal

Potential EIM-wide transmission rate – the ISO proposes to provide updates on the analysis presented in the draft final proposal on a regular basis through the Market Performance and Planning Forum (MPPF). Based upon stakeholder comments, the ISO believes that this will provide for additional monitoring through an existing forum versus maintaining a separate stakeholder initiative to review a portion of EIM data. If the data presented justifies commencing a stakeholder initiative, the ISO will work with stakeholders to prioritize this initiative relative to other planned initiatives.

Flow entitlements for base schedules/day ahead schedules – the ISO proposes to provide updates on the analysis presented in the draft final proposal on a regular basis through the Market Performance and Planning Forum (MPPF). Based upon stakeholder comments, the ISO believes that this will provide for additional monitoring through an existing forum versus maintaining a separate stakeholder initiative to review a portion of EIM data. If the data presented justifies commencing a stakeholder initiative, the ISO will work with stakeholders to prioritize this initiative relative to other planned initiatives.

EIM transfer congestion rent treatment – the ISO clarifies that the location of an EIM internal intertie is not established based upon which EIM entity creates the tag, but which balancing authority area the constraint is located. The real-time congestion offset for an EIM entity is calculated by summing the congestion across all constraints located within its balancing authority area.

Market power mitigation – Stakeholders broadly support always including EIM transfer limits into an EIM BAA in the market power mitigation process, similar to any other constraint. Currently FERC authorization is required. The ISO has provided additional description of how EIM transfer limits are tested using the BAA power balancing constraint and proposes to always include EIM transfer limits in the market power mitigation process.

Bidding rules on EIM external interties – The ISO is proposing to not require mandatory 15-minute intertie bidding at this time. In addition the ISO is planning a workshop to discuss reasons the ISO FMM liquidity is below expectations. Since FMM liquidity is the primary driver of the benefits of 15-minute economic bidding of imports and exports in the EIM, this workshop will help to ensure that the benefits will exceed the potential shortfalls. In addition, the ISO will be commencing a stakeholder initiative as part of the PacifiCorp integration activities to complete the full network model implementation on ISO intertie scheduling points.

Compensation for third parties making capacity available for EIM transfers – the ISO proposes to continue this discussion as part of the potential EIM-wide transmission rate design discussion that may commence based upon the data presented in the MPPF or if needed to support a new EIM entity joining the EIM. The ISO introduced the topic to provide stakeholders with additional understanding how the EIM transfer cost approach from Phase 1 can be used to meet additional policy objectives.

Outage reporting to Peak Reliability Coordinator – the ISO clarified that there will be no change in the functional responsibility of the ISO and no assumption of responsibility for the provision of the information to the Peak Reliability Coordinator.

Standard base schedule treatment for e-Tags – during discussion with PacifiCorp and NV Energy, the ISO discovered the need to specify how base schedules should be established for imports/exports. This decision cannot be at the discretion of the EIM entity, because a base schedule import for one BAA is a base schedule export for the other BAA. Therefore, the ISO has proposed to require EIM entities to accept approved, pending, and adjusted e-Tags as valid means to communicate an import/export base schedule to an EIM entity for purposes of imbalance settlement.

4 EIM-Wide Transmission Rate

The June 30, 2015, Issue Paper and Straw Proposal identified four alternative potential transmission service rates, for compensation for EIM's transmission use of EIM, along with principles for comparison of the alternatives:

1. Reciprocity in Use of Transmission Made Available by Rights-Holders in EIM Entities: Alternative 1 would continue the existing EIM transmission rate design, which simply relies on the ISO's and each EIM entity's existing transmission access charges (TAC) to collect their transmission revenue requirements.
2. EIM Transmission Access Charge: Alternative 2 would modify the existing approach by taking a step toward a regional transmission rate design, by applying a portion of each entity's transmission revenue requirement as a blended EIM TAC. The blended TAC would apply to real-time withdrawals in the ISO and EIM footprints,
3. Transfer Charge as a Minimum Shadow Price: This alternative would incorporate a shadow price for transfers between the ISO and EIM entity BAAs, similar to a congestion shadow price.
4. Transmission Access Charge Applicable to Load and Wheeling: To maintain comparable treatment among all ISO market participants (a) without regard for participation in EIM, and (b) without regard for scheduling in the day-ahead versus real-time market, the ISO's transmission access charge could be revised to apply only to load and to wheeling schedules (not to exports from the ISO). If this alternative were pursued, similar rate changes to EIM entities' transmission rates would need to be developed.

Further detail on these alternatives can be found in the Issue Paper and Straw Proposal.

FERC has accepted the initial proposal regarding reciprocal transmission charges with other EIM Entity BAAs as being just and reasonable, and not unduly discriminatory. FERC found that EIM transfers are not similarly situated to other ISO exports for the purpose of the transmission rate proposal, and that EIM represents a sufficiently different market structure to justify different rate treatment, including that the ISO has dispatch authority over EIM participating resources in both the ISO's BAA and in the EIM Entity BAAs. The ISO's reciprocal transmission proposal allows for similar treatment of transmission charges when compared with transmission charges

in the ISO market (which assesses the transmission access charge to load-serving entities and a wheeling access charge to exports), except here the market has been expanded to the EIM. FERC generally has not required the elimination of inter-RTO rate pancaking, but has required the elimination of intra-RTO rate pancaking, and found that the elimination of pancaked transmission rates within the EIM promotes more efficient and competitive electricity markets, provides customers in the EIM and ISO access to additional energy supplies, decreases the number of transactions that must pay pancaked rates, and therefore enhances competitive electricity markets in the region, resulting in lower overall energy costs and benefitting the native load customers who largely bear transmission costs.

The Issue Paper and Straw Proposal observed that analyses of EIM's actual benefits have shown that the initial EIM design has indeed produced benefits as expected, and has not revealed operational problems using this transmission rate alternative. Thus, given these actual benefits and FERC's rationale for accepting the initial EIM transmission rate structure, it should be expected that any adoption of an alternative to the existing approach should be premised on demonstrations that the alternative would be superior to this initial rate design, which is alternative 1.

Stakeholder comments on the Issue Paper and Straw Proposal include comments favoring both alternatives 1 and 2, but not alternative 3 or 4.[1] The ISO will use these comments in prioritizing its analyses of the initial four alternatives, to focus primarily on alternatives that receive stakeholder support. One comment identified a fifth alternative: For each operating hour, net EIM transfers across each EIM internal intertie would be calculated and multiplied by the ISO's wheeling access charge for exports from the ISO, or by the applicable transmission provider's hourly non-firm rate for exports from EIM entity BAAs, and then these costs would be allocated to each SC in proportion to their net purchases in the EIM. The ISO will include alternative 5 along with the original alternatives.

The Issue Paper and Straw Proposal also described two types of data on transmission usage within the EIM area during the initial year of EIM operations, which at a minimum, will be considered in comparing the alternative transmission rate designs:

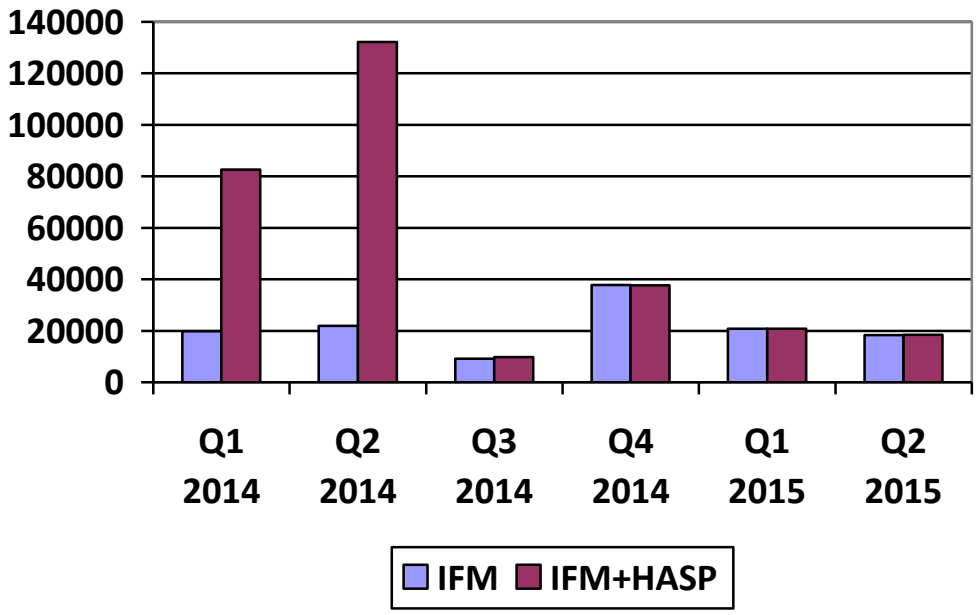
1. The final schedules between EIM entities' and the ISO's BAA are the result of both forward scheduling in the day-ahead market and hourly block schedules in the hour-ahead scheduling process, and real-time EIM transfers using fifteen- and five-minute dispatch intervals. Pre-existing transmission charges apply to the forward schedules, while a potential EIM-wide transmission rate would apply only to the EIM transfers. Comparing transmission usage between these market processes will consider the net impact of EIM transfers.
2. A concern of some stakeholders has been that the EIM's use of a different transmission rate structure than forward scheduling could lead market participants to rely on EIM rather than forward scheduling, thus impacting transmission revenues. Comparing the

[1] Specific comments are summarized separately. Some stakeholder comments stated a desire for further analysis before stating positions about specific alternatives.

volume of forward scheduling over time may provide information about the likelihood of this occurring.

In EIM operations to date, there has only been one EIM entity BAA operator (which has operated two BAAs), whose direct pre-EIM participation in the ISO's markets was only a fraction of the ISO market's overall interchange. EIM has created opportunities to significantly expand its real-time market activity, with significant benefits to both the ISO and the EIM participant. However, the history is insufficient at this time to compare the transmission usage of EIM participants under the transmission rate alternatives. What can be compared is the volume of forward market scheduling in the initial months of EIM operation compared to the previous year, as shown in the following graph. The key observation is that the level of day-ahead scheduling has been about the same pre-EIM and post-EIM, i.e., the first two calendar quarters of 2014 versus 2015.[2] Thus, there is no appearance so far that EIM's implementation has reduced forward scheduling, and the ISO does not recommend changes to the transmission rate structure at this time. The ISO will continue to monitor these data series as EIM operations continue, and will periodically report the results to stakeholders and to consider possible changes to the transmission rate structure.

Table 2



The ISO also invited proposals for additional analyses, and will consider whether analyses proposed by stakeholders could be completed within the timeframe of this stakeholder process. Stakeholder comments on the Issue Paper and Straw Proposal have not identified specific data

[2] Little can be concluded from higher activity in the hour-ahead scheduling process in the first half of 2014 because this market structure was replaced by 15-minute scheduling in mid-2014. Activity in the third and fourth quarters of 2014 will be compared to 2015 once 2015 data are available, but the 2014 data may be affected by start-up activity of EIM implementation.

items in addition to those identified by the ISO (transmission usage from forward schedules versus EIM transfers, and the volume of forward scheduling before versus after EIM implementation), but some stakeholder comments suggested broader analyses of economic impacts of alternative transmission rate designs. As further operational experience through EIM becomes available, the ISO will determine whether broad analyses of economic impacts are feasible and warranted.

5 Flow entitlements for base schedules/day-ahead schedules

Currently the real-time congestion offset is calculated for each EIM BAA based upon the location of the constraint. Under the current design, each EIM BAA is responsible for resolving congestion in its hourly base schedules (or day-ahead schedules for the ISO) within its BAA prior to the start of the EIM. While flows from other EIM BAA base schedules may cause congestion in an EIM BAA, the other EIM BAA does not need to modify its base schedules. In the event that base schedules have unresolved congestion, the EIM will re-dispatch resources to resolve the congestion, resulting in real-time congestion offset uplifts. Flow entitlements would be a settlement mechanism to allocate a portion of an EIM BAA's real-time congestion offset to other EIM BAAs if the other EIM BAA's base schedule flows exceed agreed upon flow entitlements between the EIM BAAs.

Flow entitlements are not easily implemented. The establishment of the flow entitlements must be determined for each selected transmission path either through historical analysis or negotiation. However, the values calculated from historical analysis or negotiated between EIM BAAs may not reflect actual system flows for the operating hour because the flow entitlement cannot reflect changes in system flows caused by transmission or generation outages. The difference between the assumed system flows and actual system flows can undermine the objective of establishing flow entitlements because an EIM BAA is exacerbating the real-time congestion offset in another EIM BAA. Therefore, the ISO would only propose flow entitlements if the benefits of more accurate calculation of real-time congestion offset exceeded the complexity and inaccuracies of enforcing constraints to implement flow entitlements when base schedules are determined.

The initial scope of this analysis is to examine the contribution of PacifiCorp to ISO's real-time congestion offset. In the future, this can be expanded to include the impact of ISO day-ahead schedules on PAC transmission constraints. The analysis focuses on days with large real-time congestion that could cause a significant real-time congestion offset uplift. On these days, the impact of PACW and PACE base schedules on the ISO real-time congestion offset is calculated. The goal of this analysis is to determine if there is a large impact of EIM base schedules during periods of high real-time congestion.

The EIM flow impact from PAC resources is determined across all binding constraints in the ISO:

$$for\ all\ \left|SF_{i,j}\right| \geq 0.02$$

$$EIM\ congestion\ contribution = \sum_{j}\sum_{i} -\left(Q_i^{RT} - Q_i^{Base}\right) \times SF_{i,j} \times \lambda_j$$

λ_j = shadow value for constraint j
$SF_{i,j}$ = shift factor of node i on constraint j
Q_i^{RT} = real-time flow from EIM node i
Q_i^{Base} = base schedule flow from EIM node i

If PAC base schedule increase the ISO real-time congestion offset, it is possible to allocate the real-time congestion offset payment to PAC to account for their impact. Then any deviation from the flow entitlement would result in a portion of the cost charged to the neighboring BAA.

$$for\ all\ SF_{i,j} \geq 0.02$$

$$if\left(Q_i^{Base} > Q_i^{FE}\right)$$

$$EIM\ allocation\ of\ RTCO = \sum_j \sum_i \left(Q_i^{Base} - Q_i^{FE}\right) \times SF_{i,j} \times \lambda_j$$

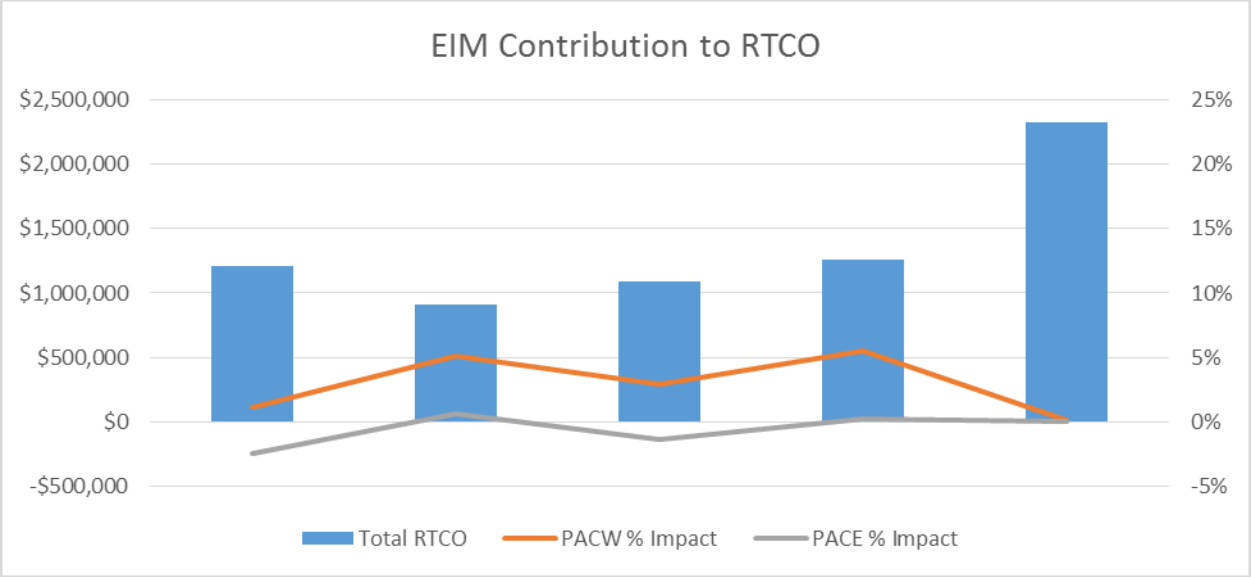
$$for\ all\ SF_{i,j} \leq -0.02$$

$$if\left(Q_i^{Base} < Q_i^{FE}\right)$$

$$EIM\ allocation\ of\ RTCO = \sum_j \sum_i \left(Q_i^{Base} - Q_i^{FE}\right) \times SF_{i,j} \times \lambda_j$$

Supposing a fair flow entitlement that would prevent the one EIM BAA from causing real-time congestion on another EIM BAA, the first EIM BAA would be allocated the real-time congestion offset costs that result from the real-time re-dispatch of resources caused by the over-scheduling or under-scheduling of its flows.

The ISO has conducted preliminary analysis of five of the days resulting in the highest real-time congestion offset for the ISO in 2015. The EIM contribution shown is the real-time congestion offset uplift resulting from differences between FMM flows and base schedule flows. The chart below shows the total ISO real-time congestion offset and the relative impact of PACW and PACE for each day analyzed. PACW added approximately $165,000 to ISO's $6.8 million RTCO on these days, contributing to 2.4% of total uplift costs. PACE contributed a net payment of $35,000 that reduced the RTCO.



The ISO will continue to monitor the possibility of EIM BAAs submitting infeasible base schedules that will significantly increase ISO's real-time congestion offset uplifts. Future market reports will include the impact of PacifiCorp (and subsequently NV Energy) on other EIM entities' real-time congestion offset. If the EIM BAA has substantial contributions to another EIM BAA's real-time congestion offset, then the possibility of flow entitlements could be evaluated.

6 EIM transfer congestion rent treatment

In the fifteen-minute market (FMM) and five-minute real-time dispatch (RTD), the market enforces intertie scheduling limits to ensure energy transfer schedules do not exceed transmission path scheduling limits. Intertie scheduling limits are similarly applied to EIM external interties, EIM internal interties, and intertie scheduling points that share both EIM external interties and EIM internal interties. The ISO also enforces EIM transfer limits to ensure that the EIM transfers are within the transmission capability made available by the EIM entity. Since the real-time congestion offset is calculated for an EIM BAA by summing the congestion rents on all constraints located within its BAA, the ISO must determine in which BAA the intertie scheduling limit or EIM transfer limit is located. The proposal below does not change how an EIM entity sub-allocated its real-time congestion offset according to its OATT.

An EIM external intertie is an interface between an EIM BAA and a non-EIM BAA. An EIM internal intertie is an interface between two EIM BAAs, or between an EIM BAA and the ISO. There are two types of EIM internal interties: an interface directly between two EIM BAAs, and an interface which goes through a non-EIM BAA. The first type of EIM internal interties exists between the ISO and NV Energy (NVE) and between NVE and PACE. Currently, the second type exists between the ISO and PACW, and between PACW and PACE.

For the first case, where an interface is directly between two EIM BAAs, the full intertie scheduling limit is available to support EIM transfers in both the FMM and RTD. Stated

differently, the total EIM transfer limit and the intertie scheduling limit use the same limit (whichever is more limiting). No other transactions exist on these interties, except for the energy transfer schedule between the relevant EIM BAAs. For the second case, the intertie scheduling limit will be greater than the EIM transfer limit because the EIM entity has only made available transmission to the intertie scheduling point. An EIM transfer must compete with other market transactions within the intertie scheduling constraint in order for the EIM transfer to cross the intertie scheduling point. In addition, the non-EIM BAA may enforce different limits on the amount of incremental change that can occur in the FMM and RTD. This is the case today with PacifiCorp and Bonneville Power Administration (BPA) and the reason the EIM transfer is tagged as both dynamic and static schedules between PACW and CISO.

Congestion rents are collected on all constraints: intertie scheduling limits, EIM transfer limits, and rate of change constraints. The current design splits congestion rents on EIM transfer limits equally between the two balancing authorities in the EIM footprint. For example, the congestion rents collected on the EIM transfer from PACW to the ISO is split between the two BAAs. However, the EIM transfer from PACW to the ISO must also compete with other market transactions within the intertie scheduling limit. As a result, congestion rents can occur on both the EIM transfer constraint and the intertie scheduling constraint. Since the congestion rents on the EIM transfer are independent of the intertie scheduling limit, splitting congestion rents equally on the EIM transfer constraint is not appropriate.

The ISO proposes the following settlement of real-time congestion rents for intertie scheduling constraints and EIM transfer constraints for two BAAs in the EIM as follows:

- EIM external intertie:
    - 100% to the EIM BAA with which the intertie scheduling point is interconnected

- EIM internal intertie where intertie scheduling limit is less than or equal to the total EIM transfer limit:
    - 50% to each EIM BAA on each side of the EIM internal intertie

- EIM internal intertie where intertie scheduling limit is greater than the total EIM transfer limit:
    - 100% of congestion revenue due to EIM transfer limit to the EIM entity which provides transmission to the intertie scheduling point
    - 100% of congestion revenue due to intertie scheduling limit to the EIM BAA managing the intertie scheduling point

In the event that multiple EIM entities submit EIM transfer limits at a single EIM intertie, the congestion rents will be allocated to each BAA in the same manner as above. For example, assume there are three BAAs. BAA #1 manages the intertie scheduling point with a 1,000 MW intertie scheduling limit. BAA #2 has 200 MW of transmission available to reach the intertie scheduling point. BAA #3 has 300 MW of transmission available to reach the intertie scheduling point. The intertie scheduling limit the congestion rents will accrue to BAA #1. The EIM transfer limit submitted by BAA #2 is 200 MW and these congestion rents will accrue to BAA #2. The EIM transfer limit submitted by BAA #3 is 300 MW and these congestion rents will accrue to BAA #3.

The 200 MW EIM transfer limit for BAA #2 does not necessarily restrict the EIM transfer from BAA #2; assuming that there is another intertie where energy transfer schedules can be tagged between BAA #2 and BAA #3 up to a 100 MW limit, there can be up to 300 MW energy transfer from BAA #2 to BAA #1: 200 MW directly on the shared intertie using the scheduling rights of BAA #2 and 100 MW wheeling through BAA #3 on the shared intertie using the scheduling rights of BAA #3.

Constraints on the net EIM transfer for a given BAA would normally not be enforced in the market; only constraints on the energy transfer schedules on specific interties would be enforced to observe the relevant scheduling limits. Nevertheless, the net EIM transfer may be constrained under the following specific scenarios:

a) The BAA is in contingency; in which case the net EIM transfer is constrained to its last optimal schedule to isolate the BAA from the rest of the EIM area while the BAA operator responds to the contingency event.

b) The BAA has failed the flexible ramp sufficiency test, in which case the net EIM transfer is constrained from below (in the import direction) to the optimal 15 min schedule from the FMM for the last 15 min interval before the start of the operating hour, or the base EIM transfer for the hour before the operating hour, whichever greater.

c) The BAA (only applicable to EIM BAAs) has requested isolation or has initiated separation from the EIM Area.

Constraining the net EIM transfer does not prevent energy transfer wheeling through it. In these scenarios when the net EIM transfer constraint for a BAA is binding, the associated congestion revenues are distributed 100% to that BAA.

The EIM transfer cost used to determine the optimal schedules of EIM transfers between EIM BAAs for tagging will be included in the marginal cost of congestion. As such, the EIM transfer cost will follow the same settlement for congestion rents outlined above.

7 Dynamic competitive assessment for market power mitigation of EIM transfer limits

In the EIM Go-Live Enhancements initiative, the ISO committed to explore additional dynamic triggers for the inclusion of EIM transfer constraints into the EIM area in the market power

mitigation process. A potential example contemplated was if EIM transfer capability into an EIM area exceeds the historical imbalance needs of the EIM BAA. In those hours, the constrained EIM transfers could be excluded from the market power mitigation process. However, if an EIM entity fails the resource sufficiency evaluation, incremental EIM transfers are not allowed in that operating hour. As a result, the assumption that EIM transfer capability will exceed historical imbalance needs cannot be assumed.

The ISO does not believe EIM transfer limits into an EIM BAA should be treated differently than any other internal constraint with regard to market power mitigation. The ISO proposes that, as with all internal constraints within the ISO and within the EIM BAA, aggregated EIM transfer limit into an EIM BAA, which is the EIM BAA specific power balance constraint, will be tested for competitiveness when the constraint is binding. This would obviate the need for a specific structural competiveness assessment by the Department of Market Monitoring and authorization from FERC to include the EIM transfer limit in the market power mitigation.

In Phase 1, the EIM transfer constraint moved from a single net-scheduled interchange constraint to multiple EIM transfer limits for each intertie scheduling point. The change was needed because, with the addition of NVE, there will be numerous intertie scheduling points which can be scheduled and tagged to account for EIM transfers. EIM transfer limit constraints into an EIM BAA that are included in the market power mitigation procedures are represented in the LMP decomposition by the EIM BAA specific power balance constraints. The shadow price of the BAA specific power balance constraint is equal to the sum of the shadow prices of the relevant set of EIM transfer limit constraints. The shadow price on the EIM BAA specific power balance constraint will be included in the LMP decomposition as either competitive congestion costs or non-competitive congestion costs depending on whether the constraint is deemed competitive or non-competitive.

8 15-Minute Economic Bidding on EIM external interties

Since the EIM is an extension of the ISO's real-time market, 15-minute economic bidding on intertie scheduling points is supported. However, under the current EIM design, the EIM entity determines the rules for participation of resources located within its BAA. This includes imports and exports on external interfaces with non-EIM BAAs, also known as EIM external interties.

The ISO has discussed with stakeholders if this discretion should remain with regards to 15-minute economic bidding on EIM external interties. The ISO has highlighted the following benefits of 15-mintue economic bidding:

- Increases liquidity in the FMM,
- Allows load serving entities additional opportunity to hedge imbalance exposure by using resources external to the EIM entity where the load is located, and
- Addresses settlement inefficiencies from different participating rules by EIM entities.

It is important to recognize that 15-minute economic bidding in not a panacea. The ISO has also identified potential shortfalls with 15-minute economic bidding, such as

- Default energy bids are not calculated for 15-minute import/export bids,
- FMM liquidity on ISO interties remains below expectations.
- EIM supports the full functionality of the Full Network Model[3]. This can result in modeling differences used to price intertie scheduling points between the ISO and EIM entity.

The ISO has discussed mitigation measures that would to address some of the concerns. For example, in the straw proposal the ISO proposed to allow the EIM entity to gain sufficient operational experience with the EIM prior to intertie bidding being mandated. The ISO believes that it is appropriate that during the transition period pending with FERC in Docket No. ER15-2565 that intertie bidding would not be required. In addition, in the original transition period proposal in December 2014, the ISO contemplated graduated bid caps to minimize the impact intertie bids could have on the price discovery mechanism.

The ISO is proposing to not require mandatory intertie bidding at this time. Since FMM liquidity is the primary driver of the benefits of 15-minute economic bidding of imports and exports in the EIM, this workshop will help to ensure that the benefits will exceed the shortfalls. In addition, the ISO will be commencing a stakeholder initiative, as part of the PacifiCorp integration as a participating transmission owner, to discuss completing the Full Network Model functionality in the day-ahead market.

9 Additional items identified during implementation

9.1 Compensation for third party transmission owner to support incremental EIM transfers

During Phase 1, the ISO modified how EIM transfer limits are implemented. The EIM transfer limit ensures that imbalance energy moved between EIM BAAs is within the transmission capability made available to the EIM. As more BAAs join the EIM, the transfer limits must be considered separately for each intertie scheduling point, not in aggregate for a given BAA. The design change allows for multiple transmission providers to offer available transmission capacity to maximize the EIM transfers between EIM BAAs or through non-EIM BAAs.

Since there will potentially be multiple intertie scheduling paths on which EIM transfers can be scheduled, the ISO included a transfer cost, less than $0.01 per MWh, in the market optimization to enable the market to select the most optimal path to tag the EIM transfer. The ISO, as the market operator, will determine the appropriate level of the transfer cost. If an EIM entity has multiple intertie schedules that can account for transfers, the ISO will consult with the

[3] See draft final proposal for discussion of the differences between Phase 1 and Phase 2. http://www.caiso.com/Documents/DraftFinalProposal-FullNetworkModelExpansion.pdf

entity to determine the appropriate transfer costs to maximize the use of the transmission made available to the EIM.

The ISO believes that the EIM transfer cost approach could be expanded to allow third party transmission owners to make available incremental transmission to support transfers. The incremental transmission would increase the transfer capability between BAAs in the EIM footprint. The incremental transmission made available most likely would be through non-EIM BAAs. However, this feature could not be used to avoid the current reciprocity of not charging for transmission that supports EIM transfers. Unlike the minimal EIM transfer cost to schedule the most direct path, this transfer cost would be settled directly with the third party transmission owner. For example, assume a non-EIM BAA would allow transfers to occur through its system if there is unused transmission in the non-EIM BAA and the EIM would use this transmission at an agreed to rate, such as the non-firm transmission rate. The ISO would then set the transfer cost of the EIM transfer schedule, in this case, equal to the non-firm transmission rate. The market optimization would then use this EIM transfer schedule for tagging the transfer if the benefits of the dispatch exceeded the transfer cost. The transfer cost would then be collected from the market and paid to the non-EIM BAA.

The ISO proposes to continue this discussion either (1) as part of the potential EIM-wide transmission rate design discussion that may commence based upon the data presented in the MPPF or (2) if needed to support a new EIM entity joining the EIM. The ISO introduced the topic to provide stakeholders with additional understanding how the EIM transfer cost approach from Phase 1 can be used to meet additional policy objectives.

9.2 Outage Reporting to Peak Reliability Coordinator (RC)

Currently, an EIM entity must use the ISO Outage Management System (OMS) to enter approved outages within its BAA. Each BAA is responsible for submitting outage information into the Peak Reliability Coordinator (RC) outage application. It is current practice for smaller balancing authorities, to input outage information directly into the Peak RC system which eliminates the need for a separate outage application designed by the balancing authority. The ISO proposes to allow the EIM entity to permit the ISO to submit outage information the entity has entered into OMS to Peak RC. This proposal, similar to the current Base Schedule Aggregation Portal (BSAP), would eliminate the need for the balancing authority to develop its own outage application. The proposal would not change the reliability responsibilities of the EIM entity and no liability would be assumed by the ISO in providing this service.

10 Next Steps

The ISO plans to discuss this draft final proposal with stakeholders during a stakeholder conference call to be held on September 14th. The ISO requests comments from stakeholders on the proposed market design changes described in this draft final proposal. Stakeholders should submit written comments by September 22th to EIM@caiso.com.

Attachment D – Board Memorandum and Resolution

Energy Imbalance Market Year One Enhancements – Phase 2

California Independent System Operator Corporation

April 28, 2016

Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President, Market & Infrastructure Development

Date: October 28, 2015

Re: **Decision on EIM year 1 enhancements phase 2**

This memorandum requires Board action.

EXECUTIVE SUMMARY

This memorandum presents Management's proposed tariff changes resulting from phase 2 of the energy imbalance market (EIM) year 1 enhancements policy initiative. This initiative addressed several issues including design changes to comply with a FERC order, topics the ISO committed to address during the original EIM design stakeholder process, and other design elements identified through the process of integrating PacifiCorp and NV Energy into the EIM.

This initiative is structured in two phases. Phase 1 addressed design changes to be implemented in the Fall 2015 software release in support of NV Energy joining the EIM. These changes were approved by the Board in March and approved by FERC on October 26, 2015. Phase 2 addresses items that would benefit from having six months of operational experience under the EIM to inform their resolution and items that were deferred from phase 1 to allow additional stakeholder discussion.

Having completed phase 2 of the stakeholder initiative, Management proposes to:

- Modify the allocation of congestion cost credits resulting from transfers of electricity between EIM entities,
- Modify the market power mitigation process to always include EIM transfer limits,
- Specify how EIM entities include imports and exports in their base schedules, and
- Allow the ISO to provide outage information on behalf of an EIM entity to the regional reliability coordinator.

These proposed design changes build upon the current EIM design and will support additional balancing authorities joining the EIM in the future.

Moved, that the ISO Board of Governors approves phase 2 of the energy imbalance market year 1 enhancements proposal, as described in the memorandum dated October 28, 2015; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

DISCUSSION AND ANALYSIS

Phase 2 of the EIM year 1 enhancements initiative initially included various topics that Management determined were not necessary at this time but would continue to be reviewed. Stakeholders agreed that Management should monitor several items to determine if they should be addressed in a future policy initiative, including an EIM-wide transmission rate, flow entitlements for forward schedules, and compensation for third parties making transmission capacity available for EIM. In addition, Management will address other items in separate currently planned stakeholder initiatives, including long-term greenhouse gas design changes and economic bidding rules on EIM external interties. The specific issues addressed in the phase 2 proposal for which Management is seeking Board approval are discussed below.

Allocation of congestion credits from EIM transfers

In the case that (1) an EIM transfer limit for electricity transfers over an intertie is less than the intertie's transmission limit and (2) the intertie also connects with a non-EIM balancing area, Management proposes to allocate all of the congestion cost credits resulting from the EIM transfer limit to the EIM entity that provides the transmission to the intertie used for the transfer. Currently these congestion credits are divided pro-rata between each of the EIM entities on either side of the transfer path.

The ISO market enforces intertie transmisson limits on interchange schedules. Similarly, the real-time market enforces "EIM transfer limits," which represent the amount of transmission an EIM entity has made available for electricity transfers into and out of the EIM entity.

Transmission limits in the ISO market result in congestion credits and costs that are distributed and collected, respectively, through an uplift account. Congestion credits occur because a congested transmission path results in a lower energy price paid to supply on the upstream side of the limit than the energy price paid by downstream load, resulting in excess money to be distributed. The ISO market models these transmission paths through intertie transmission limits, EIM transfer limits, and balancing area internal transmission limits.

An EIM design principle is that congestion costs and credits attributable to a balancing area's internal transmission limits are allocated to the balancing area in which the internal transmission constraint is located. Similarly under the ISO's market settlement, congestion credits resulting from transmission limits on interties connecting an EIM balancing area to a non-EIM balancing area are allocated to the EIM balancing area to which the intertie is connected.

The current design shares congestion credits attributable to EIM transfer limits equally between the two EIM balancing areas on either side of the transfer limit. This is because the transmission to which the EIM transfer limit applies is effectively shared by both balancing areas. Management proposes to continue this congestion credit sharing in the case that the EIM transfer limit is the same as the corresponding intertie transmission limit because only EIM transfers can go across the intertie.

In the case that (1) an EIM transfer limit over an intertie is less than the intertie's transmission limit and (2) the intertie also connects with a non-EIM balancing area, Management proposes to continue to allocate the congestion credits resulting from the intertie transmission limit to the EIM balancing area that controls the intertie. However, Management proposes to allocate all of the congestion cost credits resulting from the EIM transfer limit to the EIM entity that provides the transmission used to connect the EIM balancing area to the intertie rather than maintain the current practice of sharing these congestion cost credits with both balancing areas.

Management proposes this change because in the above-desribed situation, EIM transfers compete in the market with non-EIM imports and exports for the same intertie capacity. Congestion credits arising from the intertie transmission limit due to the EIM transfer limit are indistinguishable from those arising from other imports or exports and should be allocated on the same basis to the balancing area controlling the intertie. Furthermore, the transmission represented by the EIM transfer limit is not reciprocally shared by the two EIM balancing areas on either side in the same way it is shared when the EIM transfers do not compete with other non-EIM imports and exports. Consequently, the congestion credits attributed to the EIM transfer limits should be allocated the same as congestion credits and costs due to internal transmission limits, which is to the EIM entity making the transmission available to the intertie.

Market power mitigation

During the initial EIM enhancements initiated just prior to PacifiCorp implementation, the ISO committed to explore additional triggers for the inclusion of EIM transfer constraints in the ISO's market power mitigation process. However, based on the stakeholder process, Management proposes that the EIM transfer limits into an EIM balancing authority area be treated the same as any other internal constraint with regard to market power mitigation. As a result, the power balancing constraint for each EIM balancing authority will be tested for competitiveness whenever the constraint is binding. This will ensure consistent treatment of all constraints in the EIM footprint. It will also obviate the need for a specific structural competitiveness assessment by the Department of Market

Monitoring and authorization from FERC to include the EIM transfer limit in the market power mitigation. The assessments performed with respect to PacifiCorp and NV Energy both support application of market power mitigation of EIM transfer limits. Management expects similar findings with respect to future EIM entities.

Tagging of imports and exports in base schedules

During discussions with PacifiCorp and NV Energy, Management determined that the ISO needs to specify which e-tags can be used to establish base schedules for EIM imports and exports. The rules for base schedule submission cannot be at the discretion of the EIM entity. A base schedule import for one EIM balancing authority area could also be a base schedule export for another EIM balancing authority area. Therefore, Management proposes to require all EIM entities to accept approved, pending, and adjusted e-tags as a valid means to communicate an import or export base schedule to an EIM entity for purposes of imbalance settlement. This will ensure accurate and consistent information regarding transmission capacity available for EIM transfers.

Providing outage information to reliability coordinator

Currently, an EIM entity must use the ISO's outage management system to communicate approved outages within its balancing authority area. In the WECC, each balancing authority is responsible for submitting outage information to the regional reliability coordinator's outage application. It is common practice for smaller balancing authorities to submit outage information directly into the regional reliability coordinator's outage application system. Allowing the ISO to pass through to the regional reliability coordinator the same information it receives from the EIM entity eliminates the need for a separate outage application designed by the balancing authority. Management proposes allowing EIM entities to elect to have the ISO submit outage information the EIM entity has entered into the ISO's outage management system to the regional reliability coordinator. This proposal does not change the EIM entity's balancing authority reliability requirements and no liability would be assumed by the ISO in providing this service.

POSITIONS OF THE PARTIES

Stakeholders broadly support the proposed design changes to market power mitigation, submission of import and export base schedules, and providing outage information to the regional reliability coordinator if requested by the EIM entity.

Some stakeholders have requested additional review of the proposed congestion credit allocation and have raised concerns of unintended consequences that may reduce the transfer capability between balancing areas in the EIM footprint. Management has reviewed the proposed changes with the Department of Market Monitoring and has concluded the proposed congestion credit allocation will not decrease incentives to maximize the amount of unused transmission capability to support EIM transfers.

Management's proposed congestion credit allocation better aligns with the foundational EIM principle that congestion credits and costs should reside in the balancing area in which a constraint is located.

Management reviewed the full scope of market design proposals discussed in phase 2 with the EIM Transitional Committee. The EIM Transitional Committee reviewed the current items being brought forward for Board decision, but given stakeholder feedback and the limited impact of these items, did not feel compelled to provide an opinion. The EIM Transitional Committee's primary interest focused on a potential EIM transmission rate and mandatory economic bidding on EIM external interties which, as noted above, were determined not necessary at this time but would continue to be reviewed.

CONCLUSION

Management requests Board approval of phase 2 of the EIM year 1 enhancements proposal discussed above. The proposed modifications will enhance the EIM market design by allocating congestion credits appropriately, provide more effective market power mitigation, and standardize base schedules submission for imports and exports.

Board of Governors November 4, 2015 Decision on EIM Year One Enhancements Phase 2

General Session

Motion

Moved, that the ISO Board of Governors approves phase 2 of the energy imbalance market year 1 enhancements proposal, as described in the memorandum dated October 28, 2015; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

Moved: Olsen Second: Bhagwat

Board Action: **Passed**	Vote Count: **4-0**
Bhagwat	Y
Ferron	Y
Galiteva	Y
Maullin	Not present
Olsen	Y

Motion Number: 2015-11-G1