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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.

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(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—

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(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;

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

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

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(1) **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—

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(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)(A) of this

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~~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,~~

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- (2) 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 the EIM Internal Intertie to the Balancing Authority Areas of the EIM Entities 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 the EIM Internal Intertie to the Balancing Authority Areas of the EIM Entities that provide transmission through the EIM Internal Intertie in accordance with the calculation in subsection (b)(1) of this section; and
- (C) assigning congestion revenue attributable to the EIM External Intertie or the Scheduling Point to the Balancing Authority Area that manages the intertie.

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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

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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

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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.

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

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

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(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

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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.

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29.30 Bid and Self-Schedule Submission For CAISO Markets. The provisions of Section 30 that are applicable to the Real-Time Market shall apply to EIM Market Participants, except that—

- (a) EIM Participating Resources that are also Multi-Stage Generating Resources may negotiate a Transition Cost multiplier with the ISO, 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; and
- (b) for Start-Up Cost and Minimum Load Cost values used in Proxy Cost calculations, the CAISO will utilize the Market Services Charge and System Operations Charge reflected in the EIM Administrative Charge.

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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

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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

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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.

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- (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.

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29.34 EIM Operations

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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 physical transaction at an EIM External Intertie into the FMM if -(A) the EIM Entity supports economic bidding of EIM External Intertie physical 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 of physical transactions.

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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.

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(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

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(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 Competitiveness 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.

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(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

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:

$$MCL_i = MLF_i * SMEC_r$$

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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:

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

Where:

• MLF_i (the marginal loss factor for PNode *i* to the system Reference Bus = $\partial L / \partial G_i - 1$, Where:

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L = system losses,

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G_i = generation injected at PNode *i*, and

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- $\frac{\partial L}{\partial G_i}$ is the partial derivative of system losses with respect to generation injection at bus 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.

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SMECr is the SMEC at the Reference Bus, r .