Business Practice Manual
For The
Energy Imbalance Market

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TABLE OF CONTENTS

1. INTRODUCTION 6
1.1 Purpose of CAISO Business Practice Manuals 6
1.2 Purpose of This Business Practice Manual 6
1.3 References 7
2. BACKGROUND 7
2.1 Energy Imbalance Market Overview 8
3. ROLES AND RESPONSIBILITIES 9
4. SCHEDULING COORDINATOR CERTIFICATION 10
5. CREDIT MANAGEMENT 12
6. FULL NETWORK MODEL 12
7. METERING 14
8. DIRECT TELEMETRY 15
8.1 Use of Inter-Control Center Communications Protocol (ICCP) 15
9. OUTAGE MANAGEMENT 16
9.1 Objectives, Roles, Scope, and Participants 16
9.1.1 Outage Management Objective 16
9.1.2 CAISO Role 16
9.1.3 Facility Owner Role 17
9.1.4 Application to Parties 17
9.1.5 CAISO Outage Coordination Office 17
9.2 Requesting Maintenance Outages 18
9.2.1 EIM Entity and EIM Scheduling Coordinator Outage Request Process 18
9.2.2 Generation Resource Start-Up Time 20
9.2.3 Confirmation and Acknowledgement of Receipt of Outage Request 20
9.2.4 Withdrawal or Modification of Request 20
9.2.5 Changes to Planned Maintenance Outages 20
9.3 Management of Forced Outages 20
9.3.1 Forced Outages 21
9.3.2 Extended Scheduled Outage 21
9.4 Communication of Maintenance Outage Information 21
9.4.1 Single Point of Contact 21
9.5 Records and Reports 23
9.5.1 Records of Approved Maintenance Outages 23
10. MARKET OPERATIONS 24

10.1 About the Market 24
10.1.1 Ancillary Services 24
10.1.2 Interties Between BAAs 24
10.1.3 EIM Transmission Services Information 25
10.1.4 Maximum EIM Transfer Limits 25
10.1.5 Entitlement Constraints for Rate of Changes 25
10.1.6 Transmission Constraint Relaxation 26
10.1.7 Coordination with Reliability Coordinator and WECC Unscheduled Flow Mitigation 26
10.2 Day-Ahead Operations 27
10.3 Real-Time Operations 29
10.3.1 Establishment of Hourly Base Schedules and Hourly Resource Plan 31
10.3.2 Resource Sufficiency Evaluation 32
10.3.3 Locational Marginal Prices 35
10.3.4 EIM Market Power Mitigation 36
10.3.5 Default Energy Bids 37
10.3.6 Compensating Injections in the RTM 37
10.3.7 Manual Dispatch 38
10.3.8 Contingency Dispatch 38
10.4 Contingencies and Corrective Actions 40
10.4.1 Recovery Approach 40
10.5 Separation of the EIM Entity 42
10.5.1 EIM Entity Separation from Market 42
10.6 Advanced Load Forecasting System (ALFS) 43
10.6.1 Requirements for Load Forecasting 43
10.7 Variable Energy Resource (VERs) 44
10.7.1 Forecast Fee 44
10.7.2 EIM Variable Energy Resource Forecasting 44
11. SETTLEMENTS AND BILLING 45
11.1 Charge Codes 45
11.2 Disagreements 46
11.3 Suspension 46
12. RULES OF CONDUCT 46
13. CHANGE MANAGEMENT 47
14. DEFINITIONS AND ACRONYMS 47
14.1 Acronyms 47

14.2 Definitions.....48

1. INTRODUCTION

Welcome to the CAISO ***BPM for the Energy Imbalance Market.*** In this Introduction you will find the following information:

- The purpose of California Independent System Operator Corporation (CAISO) Business Practice Manuals (BPMs);
- What you can expect from this CAISO BPM;
- Other CAISO BPMs or documents that provide related or additional information; and
- The draft status of this BPM and expected next steps.

1.1 Purpose of CAISO Business Practice Manuals

The Business Practice Manuals (BPMs) developed by CAISO are intended to contain implementation detail, consistent with and supported by the CAISO Tariff, including: instructions, rules, procedures, examples, and guidelines for the administration, operation, planning, and accounting requirements of CAISO and the markets. Each Business Practice Manual is posted in the BPM Library at: http://bpmcm.caiso.com/Pages/BPMLibrary.aspx. Updates to all BPMs are managed in accordance with the change management procedures included in the **BPM for Change Management**.

1.2 Purpose of This Business Practice Manual

The Energy Imbalance Market is an extension of CAISO's Real-Time Market. Many of the business practices applicable to the Real-Time Market also apply to the Energy Imbalance Market (EIM). This business practice manual is a guideline for EIM participants and will outline the processes in the EIM, including references to existing Business Practice Manuals. Revision requests for the BPMs may be submitted by stakeholders or an internal CAISO department.

If a Market Participant detects an inconsistency between BPMs, it should report the inconsistency to CAISO before relying on either provision.

The provisions of this BPM are intended to be consistent with the CAISO Tariff. If the provisions of this BPM nevertheless conflict with the CAISO Tariff, CAISO is bound to operate in accordance with the CAISO Tariff. Any provision of the CAISO Tariff that may have been summarized or repeated in this BPM is only to aid understanding. Even though every effort will be made by CAISO to update the information contained in this BPM and to notify Market Participants of changes, it is the responsibility of each Market Participant to ensure that he or

she is using the most recent version of this BPM and to comply with all applicable provisions of the CAISO Tariff.

A reference in this BPM to the CAISO Tariff, a given agreement, any other BPM or instrument, is intended to refer to the CAISO Tariff, that agreement, BPM, or instrument as modified, amended, supplemented, or restated.

1.3 References

Reference information related to this BPM includes:

- Other CAISO BPMs
- CAISO Tariff

CAISO posts current versions of these documents on its website.

Whenever this BPM refers to the Tariff, a given agreement (such as EIM Entity Agreement), or any other BPM or instrument, the intent is to refer to the Tariff, that agreement, any other BPM or instrument as it may have been modified, amended, supplemented, or restated from the release date of this BPM for the Energy Imbalance Market.

The captions and headings in this BPM are intended solely to facilitate reference and not to have any bearing on the meaning of any of the terms and conditions of this BPM.

2. BACKGROUND

In this section, you will find *Background* information describing CAISO's Energy Imbalance Market processes. The EIM is a Real-Time Market to dispatch economic bids voluntarily offered by Participating Resources to efficiently balance supply, transfers between balancing authority areas, and load across its footprint. EIM processes will be similar and integrated with CAISO's existing market processes. The primary difference is that the EIM only includes CAISO's Real-Time Market and not CAISO's Day-Ahead Market. The EIM will have some unique characteristics to reflect this difference. The EIM includes design elements that ensure EIM balancing authorities have sufficient generation resources available in the Real-Time Market, and allocates costs between balancing authorities according to CAISO guiding principles. The EIM also ensures that protections are in place so convergence bidding does not cause cost uplifts in EIM balancing authorities.

This market structure is reflected in the framework of this BPM, which is the same framework as applied to the EIM tariff provisions. Matters that are unique to the EIM will be addressed in this BPM. Matters that are generally applicable to the Real-Time Market and CAISO market participants will be addressed in existing BPMs. Matters applicable to both current Real-Time Market participants and EIM participants, particularly cost allocation of charges applicable to the Real-Time Market, will be addressed in the existing BPMs. This framework integrates this BPM with other BPMs and establishes this BPM as a guide for EIM participants. Existing market participants may continue to find practices applicable to their business in the current BPMs, available on the CAISO website.

2.1 Energy Imbalance Market Overview

CAISO has based the EIM on the Real-Time Market design, which was developed in part to comply with FERC Order No. 764, and consists of a 15-minute market and a 5-minute dispatch. Each of these market runs will produce schedules and locational marginal prices for resources. The EIM will also commit short-start generation units in the 15-minute market. Like CAISO's current Real-Time Market, the EIM will enforce a flexible ramping constraint to commit and position resources to meet future load and supply variability and uncertainty.

In the Day-Ahead time frame, EIM balancing authorities participating in the EIM will submit load forecasts or elect to use the CAISO created forecast for the EIM balancing, and anticipated resource Base Schedules to CAISO, while remaining responsible for reliability in their area. This information will allow CAISO to identify infeasible schedules, such as those that might cause transmission overloads in the EIM footprint, and provide advisory information to EIM balancing authorities so they can revise the Base Schedules to resolve any infeasibilities. These EIM Base Schedules will help to improve the accuracy of CAISO's Day-Ahead Market model.

In Real-Time, CAISO will financially settle the Energy Imbalance Market in a manner that appropriately recognizes the costs attributable to each participating balancing authority area. For example, CAISO will allocate bid cost recovery payments to resources, as well as neutrality amounts that track differences between payments received from load and payments to generation to each participating balancing authority, consistent with CAISO's cost allocation principles. The participating balancing authorities will be responsible for allocating these amounts according to their respective open access transmission tariffs. CAISO will use a process based on its existing local market power mitigation approach to mitigate market power in each balancing authority area participating in the EIM, and will monitor and assess the application of market power mitigation before and after implementation.

The proposed tariff revisions recognize the need for resources that serve load in the CAISO balancing authority area through the EIM to comply with California's greenhouse gas cap and

trade regulations. As it currently does for resources participating in its Real-Time Market, CAISO will allow EIM participating resources to include the costs of compliance in their energy bids and will incorporate this cost into its dispatch of generation as appropriate. CAISO will not consider this cost when it dispatches this generation that is attributable to serving load outside CAISO, and therefore, greenhouse gas regulation compliance costs will not affect locational prices outside the CAISO balancing authority area.

Transmission access to the EIM will be provided under the applicable transmission service provider tariffs. As part of a reciprocal arrangement, CAISO has proposed that there be no incremental transmission charge for the use of transmission to support EIM transfers between participating balancing authority areas. Within the first year of operation, CAISO will consider in consultation with stakeholders whether to continue this arrangement or to modify it, and this BPM will be updated accordingly.

3. ROLES AND RESPONSIBILITIES

This section identifies and describes the basic *Roles and Responsibilities* of the entities that participate in the CAISO Markets. The Energy Imbalance Market introduces four new types of participants in the Real-Time Market, which are collectively known as EIM Market Participants.

EIM Entity: The EIM Entity is a balancing authority that elects to participate in the Energy Imbalance Market. As an EIM Market Participant, the EIM Entity is responsible: (1) for identifying available transmission intertie capacity in its balancing authority area for use in CAISO's Real-Time Market and, (2) through its EIM Entity Scheduling Coordinator, for scheduling all load and resources in its balancing authority area that do not participate in the Real-Time Market (known as non-participating load and non-participating resources) and for settling charges and payments related to non-participating load and non-participating resources.

EIM Entity Scheduling Coordinator: The EIM Entity Scheduling Coordinator is the entity through which the EIM Entity participates in the Real-Time Market. In order to prevent the inappropriate sharing of information regarding transmission and generation, an EIM Entity Scheduling Coordinator cannot be a scheduling coordinator for a supply resource unless it is a transmission provider subject to the Commission's standards of conduct set forth in 18 C.F.R. § 358.

EIM Participating Resources: The EIM Participating Resources are the owners or operators of EIM resources that wish to bid supply into the Real-Time Market. EIM resources can be generating units, participating load, demand resource providers, or other resources qualified to

deliver energy or similar services, such as non-generation resources. Each type of resource that is eligible to participate in the current CAISO Real-Time Market is eligible to participate through the Energy Imbalance Market, but only if the EIM Entity supports participation by that type of resource and the resource meets the technical requirements for such participation pursuant to the terms and conditions of the CAISO tariff and the EIM Entity's open access transmission tariff.

EIM Participating Resource Scheduling Coordinator: The EIM Participating Resource Scheduling Coordinator is the entity through which the EIM Participating Resource participates in the Real-Time Market. To prevent the inappropriate sharing of information regarding transmission and generation, an EIM Participating Resource Scheduling Coordinator cannot be an EIM Entity Scheduling Coordinator unless it is a transmission provider subject to the Commission's standards of conduct set forth in 18 C.F.R. § 358. Information on How to become an EIM Participating Resource Scheduling Coordinator can be found in the **BPM for Scheduling Coordinator Certification and Termination** agreement.

To participate in the Real-Time Market through the Energy Imbalance Market, an entity must enter into a *pro forma* agreement with CAISO that sets out the parties' respective obligations with respect to the entity's role. The *pro forma* agreements are included in Appendix B of the tariff.

3.1.1 Implementing and Terminating the EIM Entity Participation

3.1.2 Prior to becoming an EIM Entity, a Balancing Authority must enter into an implementation agreement with CAISO. See Tariff Section 29.2(b). Each new EIM entity will be made public through the filing of *New EIM Entities*.

3.1.3 An EIM Entity may terminate participation in the EIM by providing 180 days' notice to CAISO. In addition, the EIM Entity may suspend operation of the EIM in its balancing authority area during the 180-day notice provision in accordance with Section 10.5 of this BPM.

4. SCHEDULING COORDINATOR CERTIFICATION

In the *Scheduling Coordinator Certification* section of this BPM, you will find the following information:

- An overview of how participants in the EIM transact with CAISO through a Scheduling Coordinator (SC).

- An overview of the process used for Scheduling Coordinator Certification.

There are two types of Scheduling Coordinators specific to participation in the EIM that are different from the Scheduling Coordinators listed in the **BPM for Scheduling Coordinator Certification and Termination**. The two types of Scheduling Coordinators that may transact in the EIM are:

- EIM Entity Scheduling Coordinators: Represent non-participating load and non-participating resources within the EIM. An EIM Entity Scheduling Coordinator may represent multiple EIM Entities if it has informed each EIM Entity of the multiple representations, and has completed an EIM Entity Scheduling Coordinator Representation Form and submitted it to CAISO in the manner noted on the form.

- EIM Participating Resource Scheduling Coordinators: Only represent resources that plan to participate in the EIM and may not be the EIM Entity Scheduling Coordinator.

The **BPM for Scheduling Coordinator Certification and Termination** outlines the processes and approximate associated timelines, including the training, testing, and informational submissions that an applicant must complete in order to become an eligible certified Scheduling Coordinator (SC) with CAISO. Both types of EIM Scheduling Coordinators are also responsible for registering with CAISO the resources that they will represent as noted in the Full Network Model section of this BPM.

The **BPM for Scheduling Coordinator Certification and Termination** also addresses the responsibilities and status that an SC must maintain in order to participate in the markets operated by CAISO. To participate in the EIM, entities must request access to a variety of applications as noted in Section 5.3.4 of the **BPM for Scheduling Coordinator Certification and Termination**. While registration as an EIM participant is part of the standard process to become an SC, if additional SC_IDs are desired, an EIM participant should refer to Section 5.5 of the **BPM for Scheduling Coordinator Certification and Termination** for more information.

For EIM Entity Scheduling Coordinators and EIM Participating Resource Scheduling Coordinators, there are certain activities outlined in Section 3 of the **BPM for Scheduling Coordinator Certification and Termination** that do not apply to participation in the EIM. Specifically, those activities listed that reflect Inter-SC Trades, CAISO Balancing Authority Area

Generating Units, CAISO Balancing Authority Area Load, and Convergence Bidding are not applicable to participation in the EIM.

5. CREDIT MANAGEMENT

In this section, you will find the information that relates to *Credit Management* within the context of the EIM. Participants in the EIM must comply with all applicable aspects of CAISO's Credit Management Policy. The **BPM for Credit Management** describes the credit-related policies and processes used at CAISO to protect the financial integrity and effectiveness of the CAISO markets. For EIM participants, since Virtual Bidding, Reliability Must Run contracts, and Congestion Revenue Rights are not applicable to the EIM, these portions of the Financial Responsibilities outlined in the **BPM for Credit Management** are not applicable.

6. FULL NETWORK MODEL

Within the *Full Network Model* section, you will find information that describes the business processes used by CAISO to maintain the Full Network Model in the EIM.

CAISO maintains a Network Model for use by the CAISO markets. The **BPM for Managing Full Network Model** explains how the Full Network Model and its associated processes are used to support market operations, and describes the process Market Participants follow in providing data used to support the model and in gaining access to model data. The CAISO Network Model contains some, but not all, of the related information for neighboring Balancing Authority Areas within WECC.

Balancing Authority Areas participating in the EIM will maintain their own Network Model processes with resources within their BAA, and will export that information to CAISO on a regular basis for promotion into CAISO's Full Network Model and subsequent use by the EIM. Any issues identified by CAISO in the EIM Entity BAA's model information will be resolved before promoting the information into a model used by the CAISO markets. EIM Entities are responsible for coordinating their network model updates with other impacted parties, including neighboring Balancing Authorities and WECC as appropriate.

The CAISO Full Network Model timeline can be found in Section 5.1 of the **BPM for Managing Full Network Model**. Before every network model update, an EIM Entity will complete and provide a network model update template to CAISO. The document will contain a detailed description of the updates for communication between CAISO and the EIM Entity network

model teams, and to the Real-Time operators. The document is posted on the Network and Resource Modeling section of the CAISO website and should contain any changes to the EIM Entity's network model including, but not limited to, new equipment, equipment commissioning/decommissioning, date/time, new system configurations, display changes, SCADA point changes, and interconnection changes.

The EIM Entity shall make the Network Model Update document available to CAISO before the commissioning/decommissioning of transmission or generation equipment. This will help resolve and cross the gap between the different cycles of network model updates among CAISO and the different EIM entities. The document is only used to synchronize the EMS network models between an EIM Entity and CAISO, and does not replace the existing requirement or processes in place to register participating and non-participating resources in an EIM Entity balancing area in the CAISO Market registry system or Master File.

An EIM Entity will export its EMS network model to CAISO along with an associated limits file. In order for CAISO to implement an EIM Entity's model into CAISO's full network model in a timely manner, the EIM Entity will send the required information to CAISO based on the full network model timeline in Section 5.1 of the **BPM for Managing Full Network Model**.

While an EIM Entity's model deployment cycle may differ from CAISO's network model update timeline, any EIM Entity market model changes should follow the effective timelines specified and maintained in the CAISO BPM Section 5.1 of the **BPM for Managing Full Network Model**. New resources must complete the interconnection processes of their host Balancing Authority Area (BAA) prior to being included in a Full Network Model build and participating in the EIM.

All resources within an EIM Entity must be included in the CAISO's Full Network Model. The New Resource Implementation guide posted on the CAISO website contains requirements for establishing new resources with CAISO. Resources participating in the EIM will be required to submit requisite information to CAISO via the Resource Data Template (RDT) process described in Section 5.4 of the **BPM for Managing Full Network Model**. Additional information regarding the specific information contained in the RDT can be found in Attachment B of the **BPM for Market Instruments**. All EIM Participating Resource Scheduling Coordinators must register the resources that they shall represent using the RDT process, update the information on a timely basis, and share that information with the EIM Entity Scheduling Coordinator in coordination with CAISO's network model update timeline. Also, an EIM Entity Scheduling Coordinator must register all non-participating resources, specifying the EIM Entity within which the resources exist, using the RDT process and update that information in accordance with CAISO's network model build process.

An EIM Entity shall update the EIM Transmission Service Information no less frequently than the timelines for updates to the Full Network Model as outlined in Section 5.1 of the **BPM for Managing Full Network Model**. Also, upon entering into an EIM Implementation Agreement, an EIM Entity shall establish and inform CAISO of the maximum EIM Transfer limit at least ninety days prior to the EIM Entity Implementation Date via the Full Network Model update process.

As previously described, the **BPM for Managing Full Network Model** explains how the Full Network Model and its associated processes are used to support market operations. For EIM participants, references to the IFM, Use Limited Resources, CRR Systems, Participating Transmission Ownership, Metered Sub-Systems, Utility Distribution Companies, Trading Hubs, and RUC Zones are not applicable to the EIM.

The section of the **BPM for Managing Full Network Model** relating to maintenance of the Full Network Model depicts the existing process, but is currently being evaluated for revisions necessary to appropriately incorporate updates from EIM Entity BAAs.

7. METERING

Within the *Metering* section of this BPM, you will find information that explains the process and procedures used by CAISO, CAISO Metered Entities, and Scheduling Coordinators for Scheduling Coordinator Metered Entities to obtain Settlement Quality Meter Data (SQMD) used for the Settlement of the CAISO markets within the EIM.

The **BPM for Metering** covers the metering responsibilities for CAISO, CAISO Metered Entities, Scheduling Coordinator (SC) Metered Entities, and Scheduling Coordinators representing Metered Entities for the meter installation, certification, and maintenance in addition to the creation of SQMD. The **BPM for Metering** also describes the process and procedures used by CAISO, CAISO Metered Entities, and Scheduling Coordinators for Scheduling Coordinator Metered Entities to obtain SQMD used for the settlement of the CAISO markets. SQMD is used for billable quantities to represent the energy generated or consumed during a Settlement Interval. SQMD is obtained from two different sources: CAISO Metered Entities (Meter Data directly polled by CAISO) and Scheduling Coordinator Metered Entities (Meter Data submitted to CAISO by Scheduling Coordinators).

Entities participating in the EIM may opt to be CAISO Metered Entities or Scheduling Coordinator Metered Entities. A determination must be made for each resource in an EIM Entity BAA, and the requisite requirements of Section 29.10 of the CAISO Tariff met, prior to that BAA

participating in the EIM. If an EIM Participating Resource chooses to switch from one type to another, they must notify CAISO and complete the associated pieces of the *New Resource Interconnection Process*.

With the exception of Section 9.2, no other portion of the metering configurations listed in Sections 9, 10, 11, or 12 of the **BPM for Metering** is currently available to EIM participants.

8. DIRECT TELEMETRY

In the *Direct Telemetry* section of this BPM, you will find information about telemetry requirements and the transfer of telemetry information for the CAISO markets as it relates to the EIM.

CAISO has specific requirements regarding the transfer of telemetry information for the CAISO markets. For transmission information, CAISO utilizes data transferred via the Inter-Control Center Communication Protocol (ICCP). For generation units, as well as certain qualified non-generation units, the **BPM for Direct Telemetry** covers the responsibilities of CAISO and CAISO Market Participants relating to the installation, validation, and maintenance of telemetry equipment, and includes the specific telemetry data required.

Prior to inclusion of an EIM Entity BAA into the EIM, CAISO and an EIM Entity must agree on the telemetry requirements for each of the different types of resources described in the Tariff Section 29.10 (a). At minimum, data must be transferred to CAISO via the Inter-Control Center Communications Protocol (ICCP). If additional requirements are required and agreed to between CAISO and an EIM Entity, a schedule of implementation of the additional requirements will be agreed to as well.

8.1 Use of Inter-Control Center Communications Protocol (ICCP)

The Inter-Control Center Communications Protocol (ICCP) is an allowable communication protocol option for the exchange of Real-Time telemetry data as a concentration of individual distributed energy resources similar to the current Remote Intelligent Gateway (RIG) aggregation model. This proposal provides an optional industry standardized communication protocol but does not eliminate the need for a direct Energy Communication Network (ECN) connectivity.

All other information security requirements remain effective as set forth in *CAISO Information Security Requirements for the ECN*.

This option is not applicable to metering and is an option only for approved entities representing multiple single-location aggregations or multi-location aggregations of a minimum size.

ICCP was established for bulk transfer of data from control centers to CAISO and was not intended for individual resource direct telemetry connections due to complexity and cost of setup and limited connectivity capabilities.

For additional information, refer to the **BPM for Direct Telemetry**.

9. OUTAGE MANAGEMENT

In the *Outage Management* section of this BPM, you will find information relating to the Outage Management process within the framework of the Energy Imbalance Market.

CAISO will implement 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. The EIM Entity shall be responsible for performing engineering studies, modeling, and approving Outages on transmission and generation facilities within the EIM Entity Balancing Authority Area. The EIM Entity will then submit the approved outages into the CAISO Outage Management System. CAISO will not evaluate or approve any outages submitted by the EIM Entity.

9.1 Objectives, Roles, Scope, and Participants

9.1.1 Outage Management Objective

The objective of the CAISO business processes related to Outage Management for EIM Entities is to reflect outage information in the CAISO markets as soon as possible in order to allow the EIM to accurately reflect their operations in the market results. EIM Entity approved Outages must be consistent with the Full Network Model.

9.1.2 CAISO Role

CAISO's role in the Outage Management business process for EIM is to provide an Outage Management System to allow the EIM Entity Scheduling Coordinator to submit notice of EIM Entity approved transmission and generation Outages for the EIM Entity BAA. This section describes the processes CAISO uses to perform this role.

9.1.3 Facility Owner Role

The EIM Entity, EIM Participating Resources, and EIM Transmission Service Providers remain solely and directly responsible for the performance of all maintenance work, whether on energized or de-energized facilities, including all activities related to providing a safe working environment in coordination with the EIM Entity. The EIM Entity is responsible for ensuring Outages have been studied, modeled, and approved prior to submission to CAISO.

The EIM Entity, EIM Participating Resources, and EIM Transmission Service Providers may elect to have an agent perform some or all of the activities required to meet their responsibilities related to Outage Management; however, the EIM Entity remains responsible for the successful completion of these activities. See Section 6, *Communication of Outage Maintenance Information,* of the **BPM for Outage Management** for a discussion of the requirement for an EIM Entity to establish a single point of contact, such as an EIM Entity SC.

9.1.4 Application to Parties

The *BPM for Outage Management* applies to CAISO and the following EIM parties:

- All associated with the EIM Entity
- Connected Entities, to the extent that the agreement between the Connected Entity and CAISO so provides
- EIM Scheduling Coordinators for EIM Participating Resources
    - Notification of approved EIM Outages via the CAISO Outage Management System UI/API or via e-mail (as a backup) if the CAISO Outage Management System is unavailable
- EIM Entity for Transmission and EIM Non-Participating Resources
    - Notification of approved EIM Outages via the CAISO Outage Management System UI/API or via e-mail if the CAISO Outage Management System is unavailable

9.1.5 CAISO Outage Coordination Office

The CAISO Outage Coordination Office (OCO) operates Monday through Friday, except holidays. OCO personnel are located in Folsom, California. The location, contact information, and areas of responsibility for this office are detailed in the most recent version of the applicable CAISO *Operating Procedures* (Section 1.5, References-3210F), available through the CAISO website.

The OCO uses an electronic Outage Management System (OMS) application to support the receipt and processing for new EIM approved Outages, as well as updates to existing Outages.

The electronic application used by CAISO for Outage Management is referenced throughout this section of the BPM.

The types of scheduled EIM Entity approved Outages that are accepted and processed by the OCO Outage Management System are as follows (not an exhaustive list):

Balancing Authority Area Interconnections work:

- All Outages that affect interconnected systems will be coordinated between Interconnected Transmission Operators.

- All work on facilities forming the EIM Entity Controlled Grid, including associated control or protective equipment:
  - This refers to all Outages affecting EIM Entity equipment and Generators with an EIM Participating Resource agreement.
- All reportable Outages or partial curtailments of EIM Participating Resources with a rated capacity greater than 10MW
- EMS work that disables any portion of the EIM Entity Grid monitoring, control, or protective equipment, including EMS equipment and communication circuits
- EMS work that affects Generator AGC or RIG equipment or communication circuits
- Interconnections with responsible entities outside the EIM Entity Balancing Authority Area.

9.2 Requesting Maintenance Outages

For additional information, see Tariff Section 29.9 *Coordination of Outages and Maintenance*.

9.2.1 EIM Entity and EIM Scheduling Coordinator Outage Request Process

The EIM Entity Scheduling Coordinator shall submit notice of approved transmission and generation Outages or revisions to approved maintenance Outages to CAISO.

9.2.1.1 Outage Scheduling Requirements

Transmission Outage Scheduling

The EIM Entity must submit a new approved Maintenance Outage or a revision to an approved Maintenance Outage to CAISO via the OMS no later than seven days prior to the start date of the proposed Outage for Transmission facilities, as specified in the CAISO Tariff Section 9.3.6.3.1, for the Outage to be a planned maintenance Outage. Note: The determination of a seven-day prior notice excludes the date of submission and the date of the Outage.

Notification by the EIM Entity Scheduling Coordinator of approved Transmission Outage must specify the following:

- Identification and location of the transmission system element(s) to be maintained
- Nature of the maintenance to be performed
- Modeled system Outage boundaries to facilitate the equipment Outage
- Date and time the Maintenance Outage is to begin
- Date and time the Maintenance Outage is to be completed
- Emergency Return Time – The time required to terminate the maintenance and restore the transmission system to normal operation, if necessary

Generation Outage Submission

The EIM Entity or EIM Scheduling Coordinator must submit a new approved Maintenance Outage or a revision to an approved Maintenance Outage to CAISO via the OMS no later than seven days prior to the start date of the proposed Outage as specified in CAISO Tariff Section 9.3.6.3.1 in order for the Outage to be a planned Maintenance Outage.

Note: The determination of seven-day prior notice excludes the date of submission and the date of the Outage.

For Generators, a request for an Outage must specify the following:

- Generating Unit or System Unit name and Location Code
- Nature of the maintenance to be performed
- Date and time the Outage is to begin
- Date and time the Outage is to be completed

- Emergency Return Time – The time required to terminate the Outage and restore the Generating Unit to normal capacity, if necessary

9.2.2 Generation Resource Start-Up Time

Generation Maintenance Outages should not include start-up time. Each generator's start-up time is documented in the Master File and is considered to begin once the generator has been called on by the EIM Entity or for a scheduled start up.

9.2.3 Confirmation and Acknowledgement of Receipt of Outage Request

CAISO OMS acknowledges receipt of each new EIM Entity approved Outage request. EIM Entity and EIM Scheduling Coordinator approved Outage requests and revisions must meet the minimum data requirements of the CAISO OMS. If an Outage request or revision passes that validation, the Outage will automatically be processed and passed to the market systems without the CAISO OCO review or revision.

9.2.4 Withdrawal or Modification of Request

The EIM Entity and EIM Scheduling Coordinator may withdraw an Outage at any time prior to actual commencement of the Outage. Outage modifications can be made via the CAISO Outage Management System and will automatically be processed if all data entries are valid.

9.2.5 Changes to Planned Maintenance Outages

The EIM Entity or EIM Scheduling Coordinator may cancel a previously approved planned Maintenance Outage or submit a request to change a previously approved planned Maintenance Outage at any time prior to the Outage start. Requests for such changes must include the information required and be in accordance with the EIM Outage request timing requirements which are consistent with the CAISO **BPM for Outage Management**. Requests to cancel an Outage after the Outage start date and time have passed are not allowed. In that situation, the Outage must be returned to service even if no Outage activity actually occurred.

9.3 Management of Forced Outages

In the *Management of Forced Outages* Section you will find the following information:

- A description of how EIM approved Forced Outages or an extension of an approved Maintenance Outage is processed in the CAISO Outage Management System (OMS).

9.3.1 Forced Outages

Outage Scheduling

If the EIM Entity or the EIM Scheduling Coordinator submits a new approved Maintenance Outage or a revision to an approved Maintenance Outage to CAISO via the Outage Management System less than seven days prior to the start date of the proposed Outage, the Outage will be a Forced Outage. The timely submission of outages directly impacts the network topology configuration, availability of the electrically connected resources, and/or the MW dispatch range of the available resources. Delays in submission of the forced outage information may result inaccurate real-time imbalance calculation for the look–ahead market intervals, and as a result price signals that may not represent the actual system conditions. Therefore, the timing requirements for submission of forced outages in the EIM entity BAA is set in accordance with the timing required for CAISO as described by the **BPM for Outage Management**, which is currently set at 60 minutes after the occurrence of the outage.

Note: The determination of seven-day prior notice excludes the date of submission and the date of the Outage.

9.3.2 Extended Scheduled Outage

If the EIM Entity or the EIM Scheduling Coordinator wishes to continue to perform maintenance work beyond the date and time specified in an approved Maintenance Outage, the Owner may submit an approved revision to extend the approved Maintenance Outage.

9.4 Communication of Maintenance Outage Information

In the *Communication of Maintenance Outage Information* Section you will find the following information:

- A description of the need for a single point of contact for communication purposes.
- A description of methods of communication to be used as a part of the Outage Management business processes.
- A brief description of the Outage Management System.

Refer to Tariff Sections 9.3.4: Single Point of Contact and 9.3.5: *Method of Communication*.

9.4.1 Single Point of Contact

All EIM Entity Scheduling Coordinator communications concerning the notice of an approved transmission and generation Outage or to confirm or change an approved Maintenance Outage

must occur between CAISO and the designated single point of contact for each EIM Entity. The EIM Entity must provide in its initial Outage notification and any subsequent changes to its Master File, the identification of the single point of contact who is responsible for all Outage Management related activities. This identification is confirmed in all communications with CAISO in relation to Outage notification, including any request to CAISO for confirmation, notification, and revision of approved Outages.

This section includes a discussion of the primary and backup mechanisms to communicate Outage Management information, a discussion of the need for some communications to be conducted with Control Center personnel, and a brief description of the CAISO OMS.

9.4.1.1 Primary Mechanism

The CAISO Outage Management System is the primary method of communicating Outage Management related information. The Outage Management System, which is described in more detail in Section 6.2.1 of the **BPM for Outage Management**, provides an automated mechanism for parties and CAISO to communicate the information required for all aspects of Outage Management. The OMS provides both a mechanism to communicate as well as a mechanism to confirm the receipt of information from users and from CAISO either by using the system user interface or by using an Application Program Interface (API).

9.4.1.2 Backup Mechanism

In the event that the CAISO OMS is not operational, emergency capabilities are used to communicate with CAISO. The emergency capabilities that can be used as a back-up if the OMS application is unavailable include:

- Electronic format (such as e-mail)
- Voice communication with Control Center Personnel

As discussed in this BPM, some Outage Management related communications by or with CAISO Control Center personnel are conducted on the telephone. These communications are described in detail in CAISO Operating Procedures (see Section 1.3, References).

9.4.1.3 Use of the CAISO Outage Management System

The CAISO Outage Management System is a secure software system that enables parties to interact with CAISO to complete the various transactions included in the Outage Management business processes. The OMS includes a web client version for use by an individual and an Application Program Interface (API) version for use in computer-to-computer data transfers.

Using the Outage Management System, an EIM Entity or EIM Scheduling Coordinator can perform the following functions:

- Submit notification of new approved EIM Outage.
- Receive confirmation of notification from CAISO.
- Obtain status of an Outage.
- Enter Outage Cause Codes (NERC GADS, reason for Outage).
- Update an Outage.
- Search the database of completed, scheduled, or active Outages. This function allows an EIM Entity Scheduling Coordinator to review only their data and not the data of other owners.
- User instructions are available on the CAISO website.

Other functions provided for in the Outage Management System (OMS) are listed in the OMS materials shown in Section 1.3, References, of the **BPM for Outage Management**.

9.5 Records and Reports

In this section you will find the following information:

- Availability of and access to Outage records retention provided for by CAISO and the access provided to those records.
- A description of the various reports related to Outage Management that CAISO produces.
- Also refer to Tariff Sections 9.3, Coordination of Outages and Maintenance; and 9.5, Records.

9.5.1 Records of Approved Maintenance Outages

The CAISO OCO maintains a record of each approved Maintenance Outage as it is implemented. Such records are available for inspection at the CAISO OCO by EIM Entities or their designated representatives. Only those records pertaining to the equipment or facilities owned by the facility owner are made available for inspection at the CAISO OCO with notice at least 15 days in advance of the requested inspection date.

10. MARKET OPERATIONS

Welcome to the *Market Operations* section of the BPM for the Energy Imbalance Market. This section describes the EIM-specific rules, design, operational elements, and separation procedures of the CAISO markets. This section is intended for those entities that expect to participate in the EIM, as well as those entities that interface with the EIM.

The operation of the EIM and the regular CAISO market are similar in many ways. Rather than repeat the description of those portions which are the same between markets, this section describes only the EIM-specific implementation details and the differences from the regular CAISO market. Therefore, it is recommended that the reader review the **BPM for Market Instruments** and the **BPM for Market Operations** prior to reading this section.

10.1 About the Market

This section is intended to describe the features of the EIM market design that are common to both the Day-Ahead and Real-Time Markets. In subsequent sections, the EIM-related features pertaining specifically to Day-Ahead or Real-Time Markets are described.

10.1.1 Ancillary Services

The EIM participants will be responsible for procuring their own ancillary services in conformance with NERC and WECC requirements. EIM resources will be allowed to submit self-provision ancillary services of the EIM Participating Resource into the RTM to reserve the capacity for the EIM Entity BAA's ancillary service and reliability dispatch needs.

10.1.2 Interties Between BAAs

This section briefly describes intertie modeling and the use of data related to interties. The intertie is oriented in the export direction with the From bus being the CAISO/EIM BAA bus.

10.1.2.1 Interchange Transactions and E-Tagging

Since the actual non-EIM Entities net schedule interchange values are not submitted to CAISO but are required for the calculation of loop flow impact of external schedules on the CAISO and the EIM entities network, CAISO will receive/download automatically all raw tag data from Western Interchange Tool (WIT) for all external BAA at a pre-defined frequency and time of day.

The data file will contain detailed schedule and path information for every transaction schedule in WIT within the specified time period. Each transaction schedule will present the North American Standards Board (NAESB) defined tag transaction type and composite state. The

data will include the source and sink BA information, and will exclude any PSE information other than that included in the tag name.

10.1.3 EIM Transmission Services Information

The EIM Entity shall send to the CAISO its EMS network model information including any flowgates, intertie definitions and physical limits on its transmission equipment and the available capacity limits for the EIM Entity internally enforced flowgates. The submission of the EIM Entity network model shall use the Common Information Model (CIM) industry standard protocol for exchanging network model data. The EIM Entity shall also send to CAISO SCADA and measurements mapped to the EIM Entity EMS network model. The process of submission of the EIM network model shall be consistent and in accordance to the already established CAISO FNM update process and its publically published deadlines for collecting network updates. Please refer to CAISO BPM for Managing Full Network Model for description of this process.

The EIM Entity shall send, via a direct interface to CAISO, the transmission limit updates due to planned or forced outages or derates for its internal major paths or flowgates that are usually posted on its OASIS system.

10.1.4 Maximum EIM Transfer Limits

EIM Entity Scheduling Coordinators shall send to the CAISO market system the EIM intertie Available Transfer Capacity (ATC) and any updates due to planned or forced outages or derates based on physical limits, schedule limits, and/or contract limits or rights owned by the EIM Entity on the EIM interties with neighboring BAAs. The Market Operator shall enforce the limits in corresponding market optimization per applicable Operating Procedures. The EIM Entity shall communicate these limits via direct interface to CAISO.

The EIM Entity shall communicate to the CAISO market system any real-time Dynamic Transfer Capability (DTC) limits enforced by any third party transmission provider that the EIM Entity utilizes its transmission or has transmission rights. The EIM Entity shall reflect the DTC limit in the transmission profile of the corresponding EIM transfer dynamic e-tag.

Specific procedures may be developed to document specific conditions, communication of EIM Entity, External BAA, or third party transmission provider as designed by EIM Entity.

10.1.5 Entitlement Constraints for Rate of Changes

The entitlement constraints limit power flow contributions from resources in an EIM Entity Balancing Authority Area (BAA), or the CAISO BAA, on interties or transmission corridors in external BAAs. Power flow contributions from intertie transactions participating in the EIM or

DAM can also be constrained by entitlement constraints. The limit in an entitlement constraint represents either contractual rights or scheduling rights that have been agreed upon between BAAs. The difference between entitlement constraints and regular transmission constraints is that the former constraint only a subset of the resources that participate in a market, as opposed to the latter where all such resources are constrained. Furthermore, entitlement constraints in the EIM may also limit the rate of change of the relevant power flow contributions across 5-minute dispatch intervals.

Specific procedures may be developed to document specific conditions, communication of EIM Entity, External BAA, or third party transmission provider as designed by EIM Entity.

10.1.6 Transmission Constraint Relaxation

Transmission Constraint Relaxation refers to the process of constraint enforcement using 'penalty' prices, as opposed to hard constraints, in order to improve the quality of the optimization solution. Constraints will be relaxed if the shadow price of the constraint exceeds the penalty value. Based on CAISO Tariff Section 29.34 (o), please refer to Section 6.6.5 of the **BPM for Market Operations** for details on the penalty prices used in the markets.

10.1.7 Coordination with Reliability Coordinator and WECC Unscheduled Flow Mitigation

EIM's congestion management process will use its effective resources to remove congestion before curtailing any existing schedules, by being responsive to price differences resulting from congestion, rather than only to reliability-based curtailments. Flows resulting from the EIM dispatch will provide counter-flows for congestion, and thereby support scheduled flows that may otherwise need to be curtailed through WECC's Unscheduled Flow Mitigation Plan (UFMP). If the UFMP has not been initiated, the Market Operator will manage congestion directly in the EIM dispatch by automatically enforcing constraints, using the transmission capacity available to EIM. EIM will dispatch only bids submitted by EIM Participating Resource Scheduling Coordinators, and will not adjust self-schedules outside the submitted bid range. Coordinated reliability curtailments such as through UFMP or Reliability Coordinator intervention in mandating schedule curtailments remain the role of the EIM Entity.

The EIM will not automatically initiate the UFMP, but will alert EIM Entities to conditions that EIM has no effective bids to resolve, which may require the EIM Entity to initiate non-market procedures. An EIM Entity may choose to issue reliability curtailments using its own procedures, after the EIM Market Operator notifies the EIM Entity that the Market Operator observes congestion or other conditions that EIM cannot resolve, or separately before such conditions occur.

It is the responsibility of the EIM entity to communicate unscheduled flow mitigation orders on any of its BAA resources via updating the energy profile of the corresponding tag to reflect the unscheduled flow mitigation procedure cuts, as well as entering manual dispatches in the designated BAA operator's CAISO provided user interface or displays, or if these displays are not functioning, through other back up mechanisms such as phone or oral communications with the Market Operator. Financial implications resulting from any uninstructed energy deviations due to manual dispatches and or lack of communication of the manual dispatches to the Market Operator is the responsibility of the resource's registered scheduling coordinator.

Dynamic e-tags for EIM flows will be updated prior to real-time to show the expected EIM Transfers, to enable management by the UFMP, and be updated for actual EIM dispatch after the end of the operating hour. Any intra-hour reduction in EIM available transmission must be communicated to the Market Operator by the EIM Entity.

When the CAISO initiates curtailments through the UFMP, EIM Market Participant schedules in the Real-Time Market will be affected based on the CAISO unscheduled flow mitigation procedure located at: http://www.caiso.com/Documents/3510.pdf

10.2 Day-Ahead Operations

This section is intended to describe the actions taken by EIM participants in the Day-Ahead Market. It is strongly recommended that readers first review Section 6 of the **BPM for Market Operations**, which describes the general operation and timeline of the Day-Ahead Market. By 10:00 a.m. on the day preceding the Operating Day, the EIM Entity Scheduling Coordinators on behalf of non-participating resources and EIM Participating Resources, will:

- **Submit Base Schedules for External BAA Supply and Interchange:**
    - The EIM Resource Plan with its components that may cover a seven-day horizon (with hourly detail for each resource) beginning with the Operating Day.
    - Day-Ahead supply Base Schedules, including intertie schedules. The process begins seven days before the Operating Day.
    - Base Schedules must be submitted (can be 0 MW) for all generating resources in an EIM Entity BAA, including EIM non-participating resources, and must include disaggregation of forward export schedules to other BAAs. Base import schedules to an EIM Entity BAA from BAAs other than CAISO must be submitted at the relevant intertie scheduling points.

- If resource(s) are modeled as a Multi-Stage Generator (MSG), the Base Schedule(s) shall include the base MSG configuration in the Day-Ahead Market (DAM).

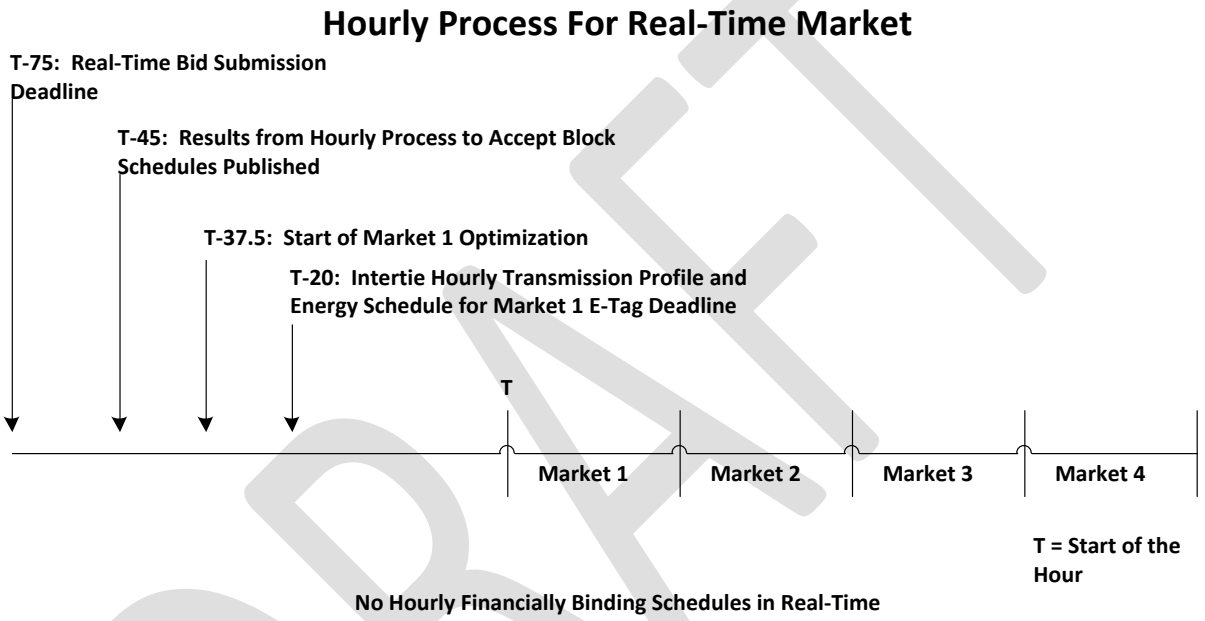
- **Perform Feasibility Test for Each EIM Entity BAA:**
  - The EIM Base Schedules included in the EIM Resource Plan should be balanced with the Demand Forecast for each EIM Entity Balancing Authority Area.
  - CAISO will perform Day-Ahead and Base Schedule power flow feasibility test; if the Day-Ahead Market resulted in transmission violation in the EIM Entity Balancing Authority Area, then the test fails.
  - The test result will be broadcasted to the EIM Entity SC.
  - The Day-Ahead Market test result is for information only and will not have a settlement impact.

- **Other Considerations:**
  - The EIM Participating Resource SC and the EIM Entity SC may not submit bids in the CAISO Day-Ahead Market, except for EIM Entity SC bids at the EIM Entity BAA Scheduling Hub.
  - The Day-Ahead Market shall run with the Day-Ahead Base Schedule as a fixed injection without enforcing transmission constraints in the external BAA and the EIM Entity BAA.
  - The Market Operator will report any transmission overloads in the EIM Entity BAAs.
  - The Day-Ahead Market will maintain historical generation, demand, and interchange schedules for all external BAAs in the EIM footprint. Also, it will harvest data from the State Estimator and WECC RC, and receive Area to Area Net Scheduled Interchange (AANSI) from WECC WIT and BAA load forecast.
  - Since the actual non-EIM Entity BAA Day-Ahead supply schedules are unknown to CAISO but are required for a solution, CAISO will estimate the schedules based on the demand forecast and net scheduled interchange using an AC power flow solution where supply, demand, and any known or historical net interchange are balanced for each BAA individually, using a distributed load slack for the corresponding BAA. The same process will also be performed for EIM Entity BAAs initially and until the Day-Ahead Base Schedule submission process becomes robust.

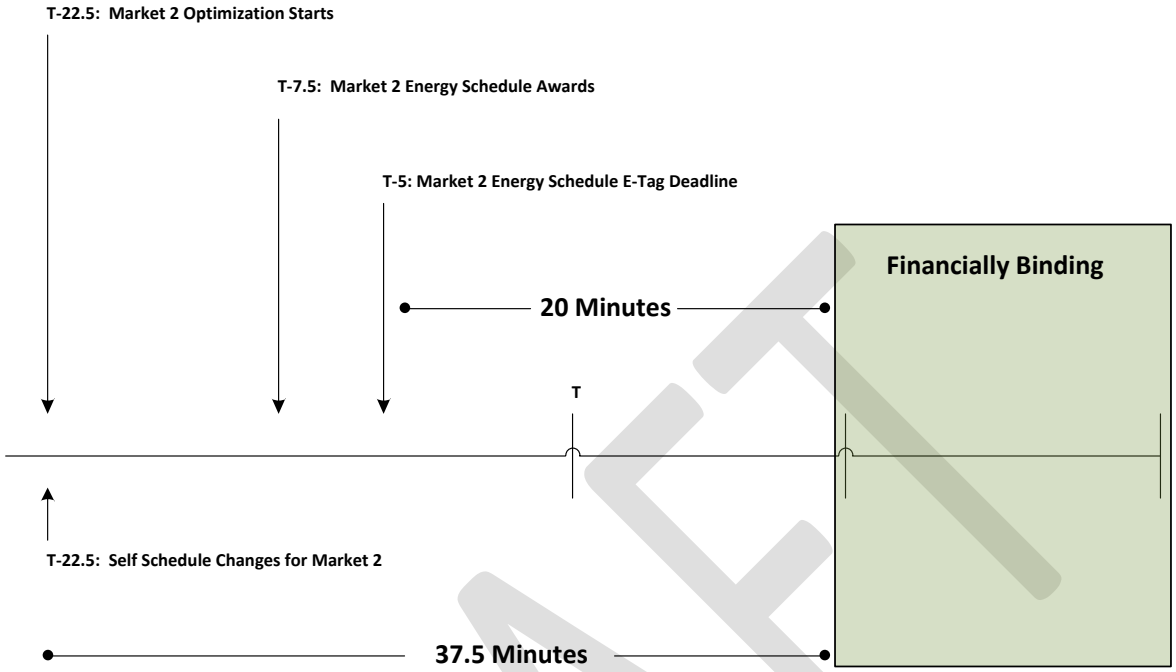
- Import/export bids to/from CAISO will be excluded from Base Schedule calculation.

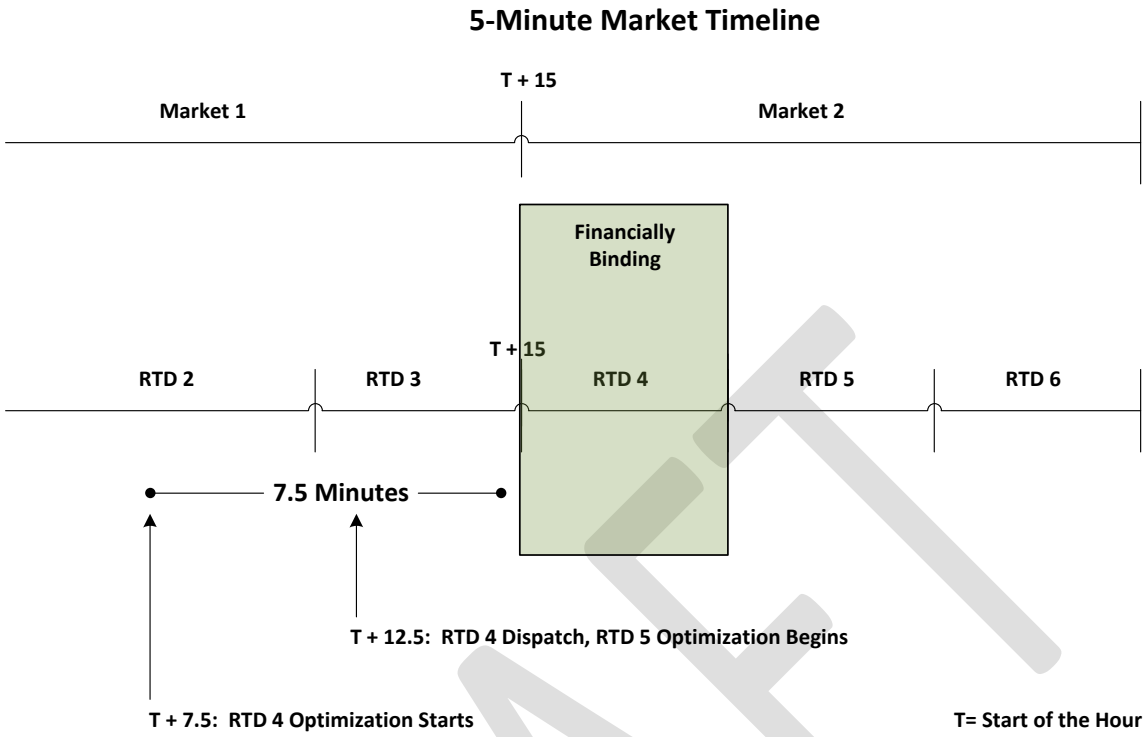
10.3 Real-Time Operations

This section is intended to describe the actions taken by EIM participants in the Real-Time Market. It is strongly recommended that readers first review Sections 6 and 7 of the **BPM for Market Operations**, which describes the general operation and timeline of the Day-Ahead Market and Real-Time Market, respectively.



15-Minute Market Timeline





10.3.1 Establishment of Hourly Base Schedules and Hourly Resource Plan

CAISO will receive hourly Base Schedules from all resources within the EIM balancing authority area and interchange transactions five hours prior to the operating hour, in order to provide an input for all Real-Time processes including the longer-term Short-Term Unit Commitment (STUC) as well as Real-Time Unit Commitment (RTUC) and Real-Time Dispatch (RTD). These hourly Base Schedules will balance against the load forecast and serve as the baseline for settling imbalance energy in the EIM. The combination of load forecasts, Base Schedules, and the bid range from Participating Resources will become the hourly Resource Plan for the EIM balancing authority. Under the EIM, the EIM Entity Scheduling Coordinator is responsible for the accuracy of the resource plan and the base schedules it submits to CAISO. The EIM balancing authority scheduling coordinator will have visibility to all elements of the Resource Plan and the results of the various checks in the resource sufficiency evaluation described below, and will be able to make changes to hourly Base Schedules to resolve unbalanced supply and demand, transmission flow overloads, insufficient Participating Resource bid range, and ramping capability. This provides the EIM balancing authority scheduling coordinator with the opportunity

to resolve any identified issues prior to the start of the EIM. At 40 minutes prior to the operating hour, the hourly Resource Plan is approved by the EIM balancing authority scheduling coordinator and it becomes final. In addition to hourly Base Schedules, Participating Resources will have the opportunity to submit bid offers for EIM dispatch by 75 minutes prior to the operating hour.

10.3.2 Resource Sufficiency Evaluation

The EIM does not include forward resource adequacy requirements or obligations for resources to submit bids, but instead includes several elements to ensure each EIM balancing authority has sufficient resources to serve its load while still realizing the benefits of increased resource diversity. The EIM design elements that ensure resource sufficiency include:

- **Load Base Schedule Adjustments:** If Base Schedules from generation resources in a Resource Plan are insufficient to meet the load forecast, CAISO will lower the load Base Schedule to equal the scheduled generation, reduced by transmission losses. The resulting shortfall will be settled through the EIM along with any applicable under-scheduling penalties as will be reflected in the flexible ramping requirements. The load Base Schedule is only used as a reference for calculating load imbalance energy for settlement. The market solution will use the applicable demand forecast for each interval in the market horizon.

- **Under-Scheduling and Over-Scheduling Penalties and Resource Balancing Provisions:** If an EIM balancing authority uses the CAISO forecast but does not schedule resources within one percent of the forecasted demand, then it will be subject to over-scheduling or under-scheduling penalties if its actual load is five percent more or less than scheduled, respectively. If an EIM balancing authority does not use the CAISO's forecast, then it will be subject to over-scheduling or under-scheduling penalties for actual load imbalances. The penalties collected will be allocated to the other balancing authorities who have not incurred a scheduling penalty for the Operating Day.

- **Capacity Test:** Prior to commencing the EIM, CAISO will administer a capacity test if an EIM balancing authority uses the CAISO forecast and does not balance that forecast exactly with submitted Base Schedules. There must be a sufficient Participating Resource capacity bid range in the EIM through incremental or decremental energy bids above or below the Base Schedules to meet the imbalance, positive or negative. If the EIM balancing authority fails the capacity test, it will automatically fail the flexible ramp sufficiency test.

- **Flexible Ramping Sufficiency Test:** Prior to commencing the EIM, CAISO will calculate a flexible ramping requirement. The requirement is based upon the CAISO load forecast, the CAISO variable energy resource forecast, and CAISO's historical assessment of the ramping capability needed to meet forecast uncertainty and variability. An EIM balancing authority will have insufficient flexible ramp capacity if the ramping capability of Participating Resources with submitted energy bids cannot meet the EIM balancing authority's flexible ramping requirement. In such cases, the EIM Transfers between the deficient EIM balancing authority and other EIM balancing authorities and CAISO will be held at previous levels.

10.3.2.1 Flexible Ramp Sufficiency Test Details

The individual EIM Entity BAA requirement for the flexible ramp sufficiency test will be calculated for the second hour of the time horizon of RTUC and Short-Term Unit Commitment (STUC) runs as follows:

$$FRR'_i = \max\left(\max(0, FRR_i - NIC_i), FRR_i \frac{TFRR - DB}{TFRR} - NE_i\right)$$

Where:

FRR'_i is the flexible ramp requirement for the EIM Entity *i* with diversity benefit;

FRR_i is the flexible ramp requirement for the EIM Entity *i* without diversity benefit;

NIC_i is the available net import capability of the EIM Entity *i*, not consumed by Base Schedules or EIM scheduled transfers prior to the operating hour;

TFRR is the total flexible ramp requirement for the entire EIM footprint without diversity benefit (the sum of FRR_i for all BAAs in the EIM including the CAISO BAA);

DB is the EIM diversity benefit; and

NE_i is the flexible ramp credit equal to the net imbalance energy export before the operating hour.

This requirement reflects a pro rata share of potential EIM Diversity Benefit and the flexible ramping credit, up to the available net import capability. The EIM Diversity Benefit is the difference between the sum of the individual flexible ramping requirements of each BAA in the EIM Area and the flexible ramping requirement for the entire EIM Area taken as a whole.

The Market Operator will perform a series of flexible ramping constraint sufficiency tests prior to commencing the EIM. The EIM Entity Scheduling Coordinator will have an opportunity to re-

submit Base Schedules if it fails the flexible ramping constraint sufficiency test or to resolve congestion up to 40 minutes prior to the operating hour, which is just before the start of the first financially binding EIM 15-minute market for the operating hour.

The flexible ramp sufficiency test is performed for each EIM Entity BAA after T-75', T-55', and T-40' for the trading hour starting at T. The test uses the initial schedules at T-7.5' and EIM resources energy bids and ramp rates.

The test for meeting flexible ramp requirements is cumulative for each 15' interval of the hour.

15' ramp from T−7.5' to T+7.5' (1st 15' interval)

30' ramp from T−7.5' to T+22.5' (2nd 15' interval)

45' ramp from T−7.5' to T+37.5' (3rd 15' interval)

60' ramp from T−7.5' to T+52.5' (4th 15' interval)

- The test passes if all four cumulative tests pass; the test fails if any of the four cumulative tests fail.

In RTUC and RTD, the flexible ramping capacity requirement constraints for the CAISO BAA, each EIM Entity BAA, each EIM Entity BAA group, and the total EIM footprint must be enforced:

- If the EIM Entity BAA fails the sufficient ramp test, CAISO will constrain the EIM Transfer for that EIM Entity BAA during the hour starting at T at its solution for T-7.5'. The Market Operator (CAISO) will enforce the individual EIM Entity BAA flexible ramp requirement in the isolated EIM Entity BAA and will not include that BAA in BAA group constraints.
- If the EIM Entity BAA passes the sufficient ramp capacity test, the flexible ramp original requirement (no DB) shall be reduced by the available net import capacity. The Market Operator will enforce the constraint for each EIM Entity BAA, the CAISO BAA, each BAA group and total requirement with DB for the EIM footprint group for BAAs that pass the flexible ramping capacity test.
- The market model will map the corresponding resources that can provide the flexible ramping capacity for the EIM Entity BAA or EIM Entity BAA group constraints.
- The flexible ramp requirements for BAA groups can be potentially lower than the individual requirements of each BAA in the group, reflecting the benefits of reduced uncertainty and volatility across the BAA group.
- CAISO will broadcast the resource flexible ramping awards.

- CAISO will publish the shadow prices of each flexible ramping constraint and associated BAA, BAA group, and total EIM footprint.

The flexible ramping capacity shall be managed in corresponding RTD for EIM market in the same manner as the current CAISO RTM. The RTD shall enforce the flexible ramping capacity requirement constraints. The requirement of each five-minute interval in the RTD run horizon will be preserved according to the pre-defined percentage of each interval, currently as 0%, 25%, 50%, 75%, 100%, 100%... The same percentage will apply to the effective requirement (reduced by the available net import capacity) for each EIM Entity BAA and EIM Entity BAA group constraints.

10.3.3 Locational Marginal Prices

The CAISO Markets, including the EIM, are based on using a Full Network Model coupled with locational marginal pricing. This coupling is meant to ensure that the Locational Marginal Prices (LMPs) reflect both the physical system as well as the schedules produced by the market applications. A detailed explanation for how the LMPs are derived is contained in Section 3.2 of the **BPM for Market Operations**.

10.3.3.1 Accounting for Greenhouse Gas Regulation

Imports of energy into CAISO and generation of energy within CAISO from greenhouse gas emitting resources are subject to the California Cap on Greenhouse Gas Emissions regulated by the California Air Resources Board (CARB). According to CARB rules, energy generated outside of California that is not imported into California is not subject to this regulation.

The EIM design accounts for this regulation through the following:

• For generation within an EIM balancing authority, the cost of the greenhouse gas compliance obligation will be included in dispatching energy from these resources to serve CAISO load, but will otherwise be excluded.

• The energy produced by each generator within an EIM balancing authority that serves CAISO load will be calculated by CAISO. EIM Participating Resources' scheduling coordinators will be provided with summary reports listing these amounts which will be the basis of their greenhouse gas regulation compliance obligation with the California Air Resources Board.

• EIM Participating Resource Scheduling Coordinators can include the costs of their greenhouse gas regulation compliance obligation as an adder to their energy bids.

The EIM has been designed so that the greenhouse gas compliance costs will not affect the locational marginal price in an EIM balancing authority area. Rather, the market optimization will calculate the marginal cost difference between EIM generation serving load in CAISO and serving load outside of CAISO. This difference will be the marginal greenhouse gas regulation compliance cost and will be the rate CAISO will use to calculate a payment to each generator in an EIM balancing authority for its output that served CAISO imbalances. This payment will be funded through the price paid within CAISO for imbalance energy.

10.3.4 EIM Market Power Mitigation

10.3.4.1 EIM Market Power Mitigation Procedure

- CAISO will use the same dynamic competitive path assessment (DCPA) and LMPM methodology to mitigate energy bids from EIM Participating Resources in the RTM. DCPA will be conducted for each transmission constraint separately in each EIM Entity BAA, and LMPM may mitigate EIM Participating Resource bids for binding congestion separately in each EIM Entity BAA. Interties between BAAs are subject to market power mitigation.
- CAISO will use the distributed load slack bus for each EIM Entity BAA as the mitigation reference bus since there is no obvious/good location that can be free of market power for an EIM Entity BAA with scattered network topology and without a high voltage transmission backbone. Therefore, each EIM Entity BAA has its own reference bus for LMP decomposition for LMPM assessment.

10.3.4.2 Dynamic Competitive Path Assessment

CAISO shall conduct the dynamic 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:

- EIM Participating Resource Scheduling Coordinators shall submit information required by CAISO to perform dynamic competitive path assessment.
- The dynamic 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.
- 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.

10.3.4.3 Locational Marginal Price Decomposition

CAISO shall perform the Locational Marginal Price decomposition for each EIM Entity Balancing Authority Area using the results of the dynamic 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 CAISO Tariff Sections 34.2.3 and 39.7, except that:

- CAISO will not mitigate resource bids for scheduling limit constraints with Balancing Authority Areas that do not participate in the EIM;
- 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(c)(4);
- 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(c)(4); and
- EIM Transfer constraints into an EIM Entity Balancing Authority Area on an EIM Internal Intertie shall be included in the Market Power Mitigation procedures if CAISO determines that EIM Entity Balancing Authority Area market power exists based on a structural competitiveness assessment of an individual or group of EIM Balancing Authority Areas in the EIM Area, provided such authority has been granted by the CAISO Governing Board based on the assessment of structural competiveness.

10.3.5 Default Energy Bids

CAISO shall use the methods and standards set forth in Section 39.7 of the CAISO Tariff to determine Default Energy Bids for EIM Participating Resources.

10.3.6 Compensating Injections in the RTM

Compensating Injections will be modeled at applicable points defined at the Full Network Model (FNM) boundary in the Real-Time Market (RTM). These Compensating Injections would be calculated by a methodology that would adjust the Compensating Injections in Real-Time so that the net schedule contributions on interties match the corresponding intertie measurements.

10.3.7 Manual Dispatch

EIM Entity BAA must inform CAISO RTM of any manual dispatch within its area. The market will reflect the dispatch in the next RTD run whenever possible. CAISO will provide a software tool that will allow the EIM Entity operator to enter a Manual Dispatch. The manual dispatch will include information such as resource name, start and end time, and megawatt constraint values. The EIM Entity operator shall enter this information as soon as possible. Once entered, the EIM Entity operator has the ability to modify the instruction while it is still active; for example, extending the time of the dispatch.

Once received by CAISO, CAISO will dispatch the resource in the next applicable market interval in accordance with the manual dispatch while still honoring resource constraints.

10.3.8 Contingency Dispatch

The Real-Time Contingency Dispatch (RTCD) mode of operation is run in response to a significant Contingency event, such that waiting until the next normal Real-Time Economic Dispatch (RTED) run is not adequate.

RTCD produces an optimized set of Dispatch Instructions for a single five-minute Dispatch Interval for EIM Entity BAA. It is possible that Dispatch Instructions are issued more than once in the same five-minute Interval, once from RTED and later from RTCD. Resources must respond to RTCD Dispatch Instructions as soon as possible. The Dispatch Instructions from RTCD override any previously issued Dispatch Instructions from RTED.

10.3.8.1 In the Event of a Contingency in the CAISO

- RTUC and RTD shall isolate the CAISO BAA from the rest of the EIM Area by fixing the EIM Transfer between the CAISO BAA and the EIM Entity BAAs at the last non-contingency market solution for binding and advisory intervals.

- RTD shall use prior advisory interval results for EIM Participating Resources while RTCD or RTDD is invoked for CAISO. These advisory results come from the last RTD before the contingency event, and shall be sent through the Automatic Dispatching System (ADS).

- This process will persist for the duration of the contingency status until RTD runs are reinstated.

- The contingency dispatch instructions for CAISO internal or CAISO dynamic resources shall be sent through ADS normally.

- Any contingency reserves dispatched in RTCD/RTDD from Intertie Resources shall be included in the CAISO BAA NSI.

10.3.8.2 In the Event of a Contingency in an EIM Entity Area

Contingencies in an EIM Entity area are generally handled by that EIM Entity, since the EIM Entity manages their own operating reserves. Thus RTCD will not be used in this case. However, the regular market systems, RTUC and RTD, will adjust available resources within the affected area to help manage the contingency situation.

- In the event of a contingency, the EIM Entity Operator will electronically communicate the contingency status to RTM.

- RTUC and RTD shall isolate that EIM Entity Area from the rest of the EIM Area by fixing the EIM Transfer between the CAISO BAA and the EIM Entity BAAs at the last non-contingency market solution for binding and advisory intervals.

- The contingency flag of the EIM Entity BAA shall be published through ADS.

- The EIM Entity Operator for the EIM Entity BAA that is under contingency may dispatch manually contingency reserves from resources (participating or not) in the BAA or Interchanges through interties with other BAAs outside the EIM Area; these manual dispatch instructions must be sent to RTM. Any interchange schedules changes shall be included in the EIM Entity BAA NSI.

- RTD shall be run with the latest operating conditions and any manual dispatch instructions. Within the affected EIM Entity area, RTD will adjust available resources and manually dispatched resources in order to help manage the contingency event.

For EIM Entities that represent multiple EIM Entity BAAs, the functionality described above is also supported at the BAA group level; therefore, the contingency signal will specify either the EIM Entity BAA or the EIM Entity BAA group.

CAISO is authorized to adjust a resource's submitted energy bid downward to the level of the resource's cost based bid, or Default Energy Bid, when the resource has been determined to wield Local Market Power. The Local Market Power Mitigation procedure is administrated by an automated process integrated into the Day-Ahead and Real-Time Market systems. This section describes the Local Market Power Mitigation procedure as it is applied to the EIM market. Applicable portions of Sections 6 and 7 of the **BPM for Market Operations** describe the general operation and timeline of the Local Market Power Mitigation process for the Day-Ahead and Real-Time Markets, respectively.

As mentioned in the previous section, the Default Energy Bid is a resource's cost-based bid that may be used in the event that the CAISO markets determine that the resource wields Local Market Power. See also the **BPM for Market Instruments** Appendix Attachment D for additional details.

10.4 Contingencies and Corrective Actions

With the implementation of the Energy Imbalance Market (EIM), measures must be in place to ensure a smooth transition from the current CAISO markets to include the co-optimization with EIM Entities. These measures must consider grid reliability, market stability, and other system conditions for all market participants. Although CAISO will do everything possible to assure a successful transition and operation of the EIM, problems may arise which would require the EIM Entity to be suspended and potentially revert back to a previous state.

A monitoring strategy is necessary to evaluate whether or not the EIM is performing according to market design and system requirements. In the event that either the market design or the software systems are not performing as expected, a series of pre-defined steps will need to be followed to address the situation and all resulting impacts.

This section of the EIM BPM covers the overview of the criteria used to arrive at the decision to revert back and to provide a high level plan to ensure a reliable and orderly termination.

10.4.1 Recovery Approach

In the event that data exchange and/or communication between CAISO and the EIM Entity BAA are disrupted, the following steps may be implemented to handle such disruptions:

1. When certain input data becomes unavailable and there is a recent history that can be used by the market applications, the latter can continue to function producing approximate, acceptable market results. For example, if demand forecast becomes unavailable, the last available demand forecast for that period could be used for the market horizon and for several market runs. Similarly, if telemetry becomes unavailable, the last SE solution can be used in the next market run. This recovery approach can be used until the data is considered too old to produce reasonable market results. The time cutoff depends on the nature and importance of the data and should be determined separately for each data stream.

2. When a market run fails, advisory market results from the last successful market run can be used. This recovery approach can be used until all advisory intervals run out.

3. When certain input data becomes unavailable, the affected BAA can be isolated from the EIM by freezing the NSI, the demand, and the dispatch at the last market solution within the hour, and at the base for future hours, and also by ignoring bids in that BAA. The market applications should still produce market results for the remaining BAAs in EIM. The affected BAA operator must balance the BAA outside EIM through regulation and dispatch instructions issued directly to resources, following pre-EIM protocols. LMPs will be calculated for that BAA and will be used to settle Uninstructed Imbalance Energy. This disruption can last for a maximum of 1 day.

4. If disruption is prolonged, an additional option can be enabled to suppress settlement statements for the affected BAA.

5. When market runs continuously fail and the above disruptions are no longer applicable because the advisory dispatches are exhausted and the market application cannot run, the fallback is the Day-Ahead schedules for the CAISO BAA and the Base Schedules for the EIM Entity BAAs; each BAA operator will balance the BAA through regulation and dispatch instructions issued directly to resources. Administrative prices will be used to settle imbalance energy.

Corrective Actions

Summary of Authority to Address Contingencies	
Period	CAISO Corrective Action(s)
Initial 60 days from Implementation Date	Discontinuation: per Tariff Section 29.1(d)(1): • Prevent EIM Transfers • Suspend EIM settlements • Terminate participation of EIM Entity (if resolution is not achieved within Tariff timeframes)
After 60 days from Implementation Date (ongoing operations)	EIM Disruption: per Tariff Section 29.7(j) • Prevent EIM Transfers • Communications failure measure • Market run failure measure

Summary of Authority to Address Contingencies	
	• Establish administrative prices • Suspend EIM settlements not available to CAISO, but CAISO will respond to request from EIM Entity
After EIM Entity Notice of Termination (180 day notice period)	Termination for this time period not at election of CAISO. CAISO would respond to Termination of EIM Entity with the following measures: • Prevent EIM Transfers (day 1 of 180 day period) • EIM Entity is switched to "non-EIM Entity" (day 2 of 180 day period)

10.5 Separation of the EIM Entity

In the event the EIM Entity needs to separate from the EIM, CAISO will take appropriate steps to restrict operations and suspend settlements within the market.

10.5.1 EIM Entity Separation from Market

When a separation is activated by CAISO:

- No Economic Bids:
  - SIBR rejects any energy bids from the resources that belong to the EIM Entity BAAs.
  - Therefore, no Unit Commitment/Economic Dispatch for EIM resources in the RTM.
- The flexible ramping requirement equals zero for the EIM Entity BAA
  - Set the flexible ramping requirement= 0 for the EIM Entity BAA in the market.
  - Set FRR test failed for the EIM Entity BAA.
- Balance the Base Schedule for EIM Entity BAA:
  - EIM Entity must submit the Base Schedules.
  - Includes the Base Schedule of EIM Entity BAAs in the balance constraint in market.
- No incremental transfer between EIM Entity BAA and the CAISO BAA:

- NSI=Base Schedule NSI for EIM Entity BAA in the RTM
- No congestion management for the EIM Entity BAA:
  - Will not enforce the EIM Entity BAA transmission constraints in RTM
- The EIM Entity SC shall submit meter in alignment with T+55B Recalculation Statement (Final Meter Submittal T+48B)
- EIM Entity SC shall submit the meter equal to the total expected energy for all the EIM Entity BAA resources.
- As normal process, the settlement produces statements at T+3B and T+12B using estimation of meter, which is the total expected energy from the market. If an EIM Entity BAA activates the separation flag, the expected energy calculated from the market will equal to the Base Schedule for all the resources/loads/interties that belong to this BAA. Therefore, the estimation of meter will equal to Base Schedule. The EIM imbalance energy will equal to zero.

Note: The EIM Entity is responsible for Base Schedule, meter submission, and imbalance energy settlement if the meter is not equal to the Base Schedule.

10.6 Advanced Load Forecasting System (ALFS)

10.6.1 Requirements for Load Forecasting

CAISO forecasts load demand for each hour of the next nine Operating Days utilizing advanced utility industry accepted neural-network forecasting software for each load forecast zone. In order to accurately forecast the load zone, the software requires historical load profiles and utilizes an ensemble of weather forecasting data sources for each zone.

CAISO's forecasting software requires the following:

- Defined EIM Entity Balancing Authority Areas to forecast.
- Defined national weather stations within EIM Entity Balancing Authority Areas
  - CAISO will contract to receive hourly weather data from weather forecast vendor (s) for stations and historical weather data, to use as an input for EIM load forecast.
- The five-minute average historical load data (at least two years) to train the forecast software.

- PI tags for EIM load data points as input to collect five-minute average data that feeds into software.

Using the above data for input into the neural-network forecasting software, CAISO will create and continually monitor its load and weather forecasting results to ensure the average forecast error is minimized.

10.7 Variable Energy Resource (VERs)

This section is based on CAISO Tariff Sections 4.6.1.1, 4.8, 9.3.10, Appendix F (Rate Schedules) and Appendix Q (Eligible Intermittent Resources Protocol (EIRP)).

10.7.1 Forecast Fee

10.7.1.1 Variable Energy Resource Forecast Charge

- **In General:** CAISO will charge EIM Entity Scheduling Coordinators and EIM Participating Resource Scheduling Coordinators a fee for the Variable Energy Resource forecasting services in accordance with Appendix F, Schedule 4.

- **Waiver:** CAISO will waive the Variable Energy Resource forecast charge if an EIM Entity has an independent forecast for its Variable Energy Resources and provides the independent forecast to CAISO.

10.7.2 EIM Variable Energy Resource Forecasting

EIM Variable Energy Resources, both participating and non-participating, must provide the ISO with an independent third party forecast of output. The independent third party forecast can be provided by a forecast service provider approved by the EIM Entity or through the ISO forecasting service. The forecast granularity for an EIM Entity approved forecast service provider is the same as required of CAISO's forecast service provider which is produced in five-minute intervals and updated every five minutes. The forecast of EIM Variable Energy Resources must be submitted to the CAISO forecast system.

If the EIM Variable Energy Resource elects the CAISO forecast, the EIM Variable Energy Resource must make metrological data available at minimum 30 days in advance so the CAISO system can do the forecast for EIM Variable Energy Resources.

In addition, the EIM participating resource, similar to VER resources located in the CAISO BAA, may elect to use SC forecast option that will allow it to submit its five-minute output forecast to CAISO SIBR system. The SC forecast will be used as the financially binding forecast.

11. SETTLEMENTS AND BILLING

In this section, *Settlements and Billing*, you will find information on the related processes within the context of the Energy Imbalance Market.

The business process for settlement of the fiscal results of participation in the EIM is outlined in the **BPM for Settlements and Billing**. That BPM provides an overview of the settlement, billing, invoicing, and financial clearing business functions, an overview of key settlement and billing principles, and an overview of the settlement and invoicing cycles.

11.1 Charge Codes

CAISO maintains the *ISO Market Charge Codes Matrix* which can be found by navigating to the Settlements subheading under the Market & Operations portion of the CAISO website. This matrix highlights which Charge Codes are applicable to the various forms of resources participating in the markets operated by CAISO. A detailed description of each settlement Charge Code or predecessor Pre-Calculation, including business rules and specific data calculation formulas, can be found in the *BPM Configuration Guide* documents posted under the Settlements and Billing section of the BPM Document Library on the CAISO website. Section 8 of the **BPM for Settlements and Billing** provides details on how to use and read a *BPM Configuration Guide*.

Settlements concepts unique to participation in the EIM include settlements related to Over- and Under-Scheduling of EIM Base Schedules, the EIM Initial Fee, and EIM Administrative Charges. As documented in Sections 29.11, 29.26, and 29.32 of the CAISO Tariff, calculations of some settlement Charge Codes have EIM-specific implications referencing the submitted EIM Base Schedules or the transfer of energy between BAAs participating in the EIM. In addition, the calculation of the settlement of the Real-Time Congestion Offset will incorporate the respective pieces of the congestion component of the LMP for PNode in each EIM BAA as noted in the formulas contained in the Configuration Guide for the Real-Time Price Pre-Calc. However, CAISO will not calculate and invoice charges related to FERC fees or NERC/WECC fees for EIM participants. In addition, there will be no charge between CAISO and EIM balancing authorities for use of transmission to support EIM Transfers for the first year of EIM operation. During this time, as stakeholders gain operational experience and additional balancing authorities consider joining the EIM, CAISO will coordinate with stakeholders to consider various alternatives for a long-term transmission rate design.

11.2 Disagreements

Any disagreements with the published results of CAISO's settlement process for the EIM must be submitted to CAISO by the Scheduling Coordinator with which CAISO settled and are governed by the dispute process outlined in Section 2.3.5 and Section 5 of the **BPM for Settlements and Billing**. Disputes by a non-participating resource of amounts calculated by CAISO and distributed to it by an EIM Entity Scheduling Coordinator are between the non-participating resource and the EIM Entity Scheduling Coordinator, not with CAISO. If an EIM Entity Scheduling Coordinator disagrees with the amounts calculated by CAISO for EIM non-participating resources, the EIM Entity Scheduling Coordinator is responsible for submitting a settlement dispute through the process outlined in Section 2.3.5 and Section 5 of the **BPM for Settlements and Billing**.

11.3 Suspension

In the case where there is a suspension of EIM participation by an EIM Entity, as described in Section 10.1.9 of this BPM, a Market Notice will be issued by CAISO to alert all market participants. The EIM Entity will still be required to submit Base Schedules during the period of the suspension along with meter data matching those values. CAISO will manually suspend the calculation of Unaccounted For Energy (UFE) for the EIM Entity BAA, but will continue to generate and publish settlement statements utilizing the Base Schedule and meter data information submitted by the EIM Entity.

12. RULES OF CONDUCT

In the *Rules of Conduct* section, you will find information summarizing the behavior that is subject to Sanction under the CAISO Tariff Rules of Conduct (CAISO Tariff Section 37).

Participants in the CAISO markets are expected to comply with the provisions of the CAISO Tariff as well as requirements contained within its Business Practice Manuals. The process that CAISO undertakes to ensure compliance with these documents is described in the **BPM for Rules of Conduct Administration**. A participant in the EIM is also subject to these rules as defined by their specific participation in the EIM.

13. CHANGE MANAGEMENT

Within the *Change Management* section of this BPM, you will find information relating to requests for additions, edits, deletions, revisions, or clarifications to a BPM, including any attachments and exhibits to a BPM that are expressly incorporated by reference.

The Business Practice Manuals (BPMs) developed by CAISO are intended to contain implementation detail consistent with and supported by the CAISO Tariff, including: instructions, rules, procedures, examples, and guidelines for the administration, operation, planning, and accounting requirements of CAISO and the markets operated by CAISO. Changes to the information provided in the BPMs posted by CAISO are governed by the process outlined in the **BPM for Change Management**.

14. DEFINITIONS AND ACRONYMS

Welcome to the *Definitions and Acronyms* section of the BPM for the Energy Imbalance Market. The **BPM for Definitions & Acronyms** serves as a general reference for readers of the CAISO BPMs. It lists definitions used in the BPMs, including both newly defined terms and pertinent terms from the CAISO Tariff Appendix A. **The BPM for Definitions & Acronyms** also provides a list of acronyms used in CAISO BPMs, as well as acronyms associated with the remainder of the defined terms in Appendix A, regardless of whether they appear in the BPMs.

14.1 Acronyms

In this section you will find abbreviations and acronyms that are used in the CAISO EIM BPM.

Acronym	Definition
AANSI	Area to Area Net Scheduled Interchange
API	Application Program Interface
BPM	Business Practice Manual
CAISO	California Independent System Operator Corporation
DAM	Day-Ahead Market
DB	EIM diversity benefit
EIM	Energy Imbalance Market
EIM Entity BAA	The Balancing Authority Area of Entity that is participating in the Energy Imbalance Market

External BAA	The Balancing Authority Area of Entities that are not CAISO BAA. External BAA includes EIM Entity BAA, non-EIM Entity BAA, and boundary BAA that are not modeled in the FNM.
HVDC	High-Voltage Direct Current
ISO	Independent System Operator
CAISO BAA	The Balancing Authority Area of California Independent System Operator
Non-EIM Entity BAA	The Balancing Authority Area of Entity that is not participating in the Energy Imbalance Market
OCO	Outage Coordination Office
OMS	Outage Management System
PSE	Purchase Selling Entity
RDT	Resource Data Template
RTM	Real-Time Market
WECC RC	Western Electricity Coordinating Council Reliability Coordinator

14.2 Definitions

In this section you will find terms and definitions that are used in the CAISO EIM BPM.

Term	Definition
Base Schedule	A forward energy schedule, with hourly granularity, that is the baseline to measure deviations for settlement through the EIM. Base Schedules include the hourly forecasts of load, hourly generation schedules, and hourly interchange schedules.
EIM Entity	A Balancing Authority that represents one or more EIM Transmission Service Providers and that enters into an EIM Entity Agreement with CAISO to enable the operation of the Real-Time Market in its Balancing Authority Area (BAA).
EIM Entity Scheduling Coordinator	The EIM Entity or a third party designated by the EIM Entity that is certified by CAISO and that enters into an EIM Entity Scheduling Coordinator Agreement, under which it is a Scheduling Coordinator and a Market Participant and is responsible for meeting the requirements specified in Section 29 on behalf of the EIM Entity.

Term	Definition
EIM Net Imbalance Interchange	The net energy transfer of real time between an EIM Entity BAA and the CAISO BAA or between EIM Entity BAAs as a result of EIM market optimization. It is calculated after the EIM market optimization, excluding Base Schedule. **EIM Transfer out** is the net imbalance energy export from the EIM Entity BAA**. EIM Transfer in** is the net imbalance energy import to the EIM Entity BAA**.**
EIM Participating Resource	An owner of, operator of, or seller of Energy from an EIM Resource that elects to participate in the Real-Time Market and enters into an EIM Participating Resource Agreement, under which it is responsible for meeting the requirements specified in Section 29 of the Tariff.
EIM Participating Resource Scheduling Coordinator	The EIM Participating Resource, or a third-party designated by the EIM Participating Resource, that is certified by CAISO and enters into an EIM Participating Resource Scheduling Coordinator Agreement, under which it is a Scheduling Coordinator and is responsible for meeting the requirements specified in Section 29 of the Tariff on behalf of the resource.
EIM Transfer	The transfer of Energy in Real Time between an EIM Entity Balancing Authority Area and the CAISO Balancing Authority Area or between EIM Entity Balancing Authority Areas using transmission capacity made available to the Real-Time Market through the Energy Imbalance Market.
Energy Imbalance Market (EIM)	The rules and procedures in Tariff Section 29 governing CAISO's operation of the Real-Time Market in Balancing Authority Areas outside of the CAISO Balancing Authority Area and the participation of EIM Market Participants in the Real-Time Market.
Market Operator	California Independent Systems Operator (CAISO)
Non-Participating Loads	The EIM Entity SC shall receive the settlement for the non-participating load. The CAISO will settle EIM non-participating load UIE as the algebraic difference between the hourly meter data and the calculated Base Schedule at the applicable hourly Real-Time LAP price using volumetric weighted average LMP of 15-minute and 5-minute markets in that hour for the relevant LAP. The weights in the calculation are as follows: For the 15-minute LMP, it is the difference between 15-minute demand forecast and the demand forecast that was used to calculated base load at T-40 (Load + Loss). For the 5-minute LMP, it is the difference between 5-minute and 15-minute demand forecast. The LMP is bounded by Max/Min LMP over the hour: For Hourly LMP , is the sum of (15-minute LMP * 15-minute demand forecast deviation from the demand forecast that was used to calculate the base load at T-40) over four 15-minute intervals + Sum of (5-minute LMP * 5-minute demand forecast deviation from the 15-minute

Term	Definition
	demand forecast) over twelve 5-minute intervals divided by The sum of [15-minute demand forecast deviation from the demand forecast that was used to calculate base load at T-40 over four 15-minute intervals + the sum of (5-minute demand forecast deviation from the 15-minute demand forecast) over twelve 5-minute intervals]
Non-Participating Resource	A resource located within an EIM Entity that chooses not to make its resource available for dispatching in the Real-Time Market. The Entity Scheduling Coordinator must ensure that these resources are accounted for when determining balanced Base Schedules.
NSI Forecast	Net-Schedule Interchange Forecast
Participating Resource	A resource located within an EIM Entity that elects to participate in the EIM. Through their Participating Resource Scheduling Coordinator, these resources submit bids to the Market Operator which convey their availability in the Real-Time Market.
Participating Resource Scheduling Coordinator	An entity certified by CAISO that submits economic bids and is responsible for financial settlements for one or more Participating Resources.
Resource Plan	Hourly resource components must cover a seven-day horizon beginning with the Operating Day. The Resource Plan consists of a combination of load Base Schedules, generation Base Schedules, interchange Base Schedules, ancillary services plans of the EIM Entity, and the bid range voluntarily submitted by EIM Participating Resources. Also, if an EIM Entity Scheduling Coordinator is not using CAISO demand forecast, then it includes demand forecast. Resource Plans balance demand and supply and are used in the resource sufficiency evaluation.
System Resource	A group of resources, single resource, or a portion of a resource located outside of the CAISO Balancing Authority Area, or an allocated portion of a Balancing Authority Area's portfolio of generating resources that are either a static Interchange Schedule or directly responsive to that Balancing Authority Area's Automatic Generation Control (AGC) capable of providing Energy and/or Ancillary Services to the CAISO Balancing Authority Area, provided that if the System Resource is providing Regulation to CAISO it is directly responsive to AGC.
Operating Day	The day when the Real-Time Market runs and Energy is supplied to Load.