California ISO

EIM Track 5 Overview – Settlements

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REVISION HISTORY

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0.1	4/28/2017	Joanne Alai	Initial draft
0.2	6/21/2017	James Lynn / Heather Kelley	Updated
1.0	6/27/2017	Joanne Alai	Final updates for consistency and formatting
2.0	5/1/2018	Heather Kelley	Updated based on lessons learned
2.1	5/20/2018	Craig Williams	Clarified training provided in EIM Track 6
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2.3	4/29/2019	Ayman Fattah, Cari Chenkin	Updated content, updated formatting, punctuation, etc.
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2.5	1/31/2020	Heather Kelley, Nancy Strouse	Updates based on lessons learned; formatted
2.6	7/23/2021	Uma Ramanathan; Nancy Strouse	Updated section 10.0 *Things to consider*.

TABLE OF CONTENTS

1.0 Purpose

This document is to provide Energy Imbalance Market (EIM) Participants with an overview of the steps and deliverables required for onboarding. EIM Participants include both EIM Entities and any EIM Participating Resources. Deliverables and timing may be adjusted if mutually agreed to by the California ISO (CAISO) and EIM Participant during the planning phase.

2.0 Track 5 Settlements Overview

There are four areas for Settlements onboarding into the Energy Imbalance Market:

1. Settlement System Integration,

2. Settlement Training,

3. EIM Participant Process Change Management, and

4. Settlement Testing and Validation.

In collaboration with assigned project managers and the EIM Participants, the CAISO Settlement team will participate in regular Track 5 meetings designed to allow the new EIM Participants an opportunity to discuss the four above-mentioned areas and request clarifications on the Settlement process, Settlement calculations, and Settlements timelines. Typical meeting topics may include:

a. **Kick-Off:** Introductions, discuss overall objective, related expectations, and project outcomes. Determine and establish frequency of meetings and required participation levels needed to be successful. Discuss past practices, e.g., lessons learned, potential cost saving measures, and best practices.

b. **Settlement Requirements:** Identify and discuss settlement system requirements. Topics will include Settlements Interface Specification and the MRI-Settlements system.

c. **Settlement Configuration:** Discuss and answer questions associated with the Business Practice Manual (BPM) for Settlements, Settlements Configuration Guides, Settlement Configuration Output File, settlement dispute process, and the settlement calendar.

d. **Data Collection and Processing:** Identify and discuss the importance of providing the highest quality Settlement Quality Meter Data (SQMD) and Intertie e-tag data in support of the CAISO settlement payment calendar.

3.0 Settlement System Integration

Settlement System Integration is divided into two processes:

- Settlement Integration and

- Settlement Configuration Overview.

Settlement Integration is the process of establishing connectivity between the EIM Participant's Shadow Settlement system and the Market Operators' systems. In conjunction with Track 4, the CAISO

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Settlement team and EIM Participants will discuss settlement systems and data requirements described in the settlement technical documentation.

Technical Documents:

- [Settlements Interface Specification](#)

- [MRI-Settlements SFTP Connectivity Instructions](#)

- [API](#)

Data Requirements:

- Submittal of accurate meter data and intertie schedules e-tag information,

- Collection of settlement supporting data from Market Operators' systems such as BSAP, CMRI, OASIS, and MRI-Settlement, and

- Retrieval of settlement statements and invoices from MRI-Settlement.

During the Settlement configuration overview process, the CAISO settlement team will discuss the system and data requirements to develop and integrate the EIM participant's shadow settlement system. The settlement configuration overview will cover:

- [BPM Settlements Documents](#)

- [BPM Settlements Configuration Guides](#)

- [Settlement Configuration Output file](#)

- [ISO Market Charge Codes Matrix](#)

4.0 Settlement Training

In support of EIM Settlement integration, the CAISO will provide the EIM Participants with several training opportunities. These various training opportunities provide the Participants with an understanding of the EIM settlement process, settlement charge code calculations, and settlement timelines. The settlement training opportunities include:

Course	Target Audience	Delivery Timeframe
Computer Based Training (CBT) modules : • Settlements Foundational Concepts • Metering and Settlements with MRI-Settlement • Settlements Validation	EIM Participant Settlement Analysts EIM Onboarding Teams	Anytime, Prior to Day In the Life
*Settlements for EIM 101: Settlements 101 reviews the market inputs that flow through to settlements and demonstrate how settlement information can be validated. Also	EIM Participant Settlement Analysts EIM Onboarding Teams	After completion of functional testing

Course	Target Audience	Delivery Timeframe
covered: how to identify configuration files and billing determinants, and how billing determinants are used in settlement formulas.	*This training will be scheduled and coordinated through Track 6.*	
*Settlement for EIM 201: Settlements 201 covers more complex charge codes that are commonly used in EIM settlements processing.	EIM Participant Settlement Analysts *This training will be scheduled and coordinated through Track 6.*	After completion of functional testing
Settlements Workshop (optional): A customized, hands-on workshop designed to walk through specific examples of how charge codes are calculated.	EIM Participant Settlement Analysts	Prior to or early in Market Simulation. Discuss with the project team.
3rd Party Workshop: The 3rd Party Workshop is jointly delivered by the EIM Participant and the CAISO. Hosted by the EIM Participant, this workshop demonstrates to non-participating resources how the CAISO Settles with the EIM Participant, and then how the EIM Participant Settles with the non-participating resources.	Non-participating Resources	Typically delivered after the EIM Participant has been approved by FERC

5.0 Participant Process Change Management

EIM Participants should perform an impact assessment to determine which of the EIM Participant's processes need to change to accommodate participation in the Energy Imbalance Market. Identifying and implementing these needs must occur before Market Simulation. This enables EIM staff to test new processes during Market Simulation and Parallel Operations, giving staff time to practice and modify processes before production implementation.

Processes to consider include:

- The retrieval and submittal of EIM statements and invoices from the CAISO

- Changes/updates to payments and invoicing processes with non-participating resources

- Settlement dispute procedures

- Process to support and maintain the EIM Participant's shadow settlement and other relevant systems

- Monitoring processes for rules of conduct with the CAISO Tariff (meter data submissions)

- Settlement quality meter data audit processes

6.0   Settlement Validation and Testing

During the Settlement Validation and Testing process, EIM Participants will perform end-to-end testing of settlement charge code calculations. During the settlement end-to-end validation, the EIM Participants should:

- Verify the ability to submit and retrieve the required settlement data

- Develop and verify shadow settlement statement validation process

- Develop and verify settlement Invoices validation process

- Develop and verify settlement dispute process

- Validate third party settlement, if necessary

As discussed in Track 4, there are three opportunities for settlement validation and testing after functional integration testing: during day in the life, market simulation, and parallel operations.

6.1   Day in the Life Testing

Objective:	After completion of the day in the life testing period, the EIM Participant should be able to do the following: • Submit and validate SQMD data to the CAISO through MRI-S (API or GUI) • Submit Intertie e-tag schedules to CAISO through EIMRTINTERCHANGESCHEDULE payload. • Retrieve EIM settlement daily market statements and monthly market statements • Retrieve EIM settlement invoices • Identify and retrieve settlement supporting data from CMRI, OASIS, and MRI-Settlements
Duration:	Day in the life testing is performed over a one-month period.
Statement Frequency:	In support of day in the life testing, the CAISO will publish: • Four Daily Initial Market Statements, one per week (T+4B) • A Monthly Initial Market Statement (T+4B) • Two Daily Recalculation Market Statements (T+8B) (only if Actual SQMD is submitted) • A Monthly Recalculation Market Statement(T+8B) and • Two Market Invoices.

Validation:	The EIM Participant should only use the above mentioned statements and invoice to validate connectivity between EIM Participant shadow settlement system, the CAISO Settlement System, and CAISO support systems.
	The EIM Participant should have a functioning shadow settlement system at this time. All functional testing should be completed.

6.2   Market Simulation

Objective:	After completion of the market simulation period, the EIM Participant should be able to:
	• Validate Daily Initial Market and Monthly Initial Market Settlement Charge Code calculations,
	• Validate Daily Recalculation Market and Monthly Recalculation Market Settlement Charge Code calculations based upon the SQMD data (including Interties) submitted,
	• Identify and validate settlement impacts from Price Corrections and
	• Validate EIM settlement invoices.
Duration:	The market simulation is approximately six to eight weeks in duration.
Statement Frequency:	In support of market simulation testing, the CAISO will publish:
	• Two daily Initial Market Statements per week (T+4B)
	• A Monthly Initial Market Statement per week, starting the second week (T+4B)
	• Two Daily Recalculation Market Statements per week (T+8B)
	o CAISO will initiate the Price Correction process for one Daily Recalculation Market Statement
	• A Monthly Recalculation Market Statement per week, starting the third week after meter data submission (T+8B)
	• Two Market Invoices
Validation:	The EIM Participant should use the above-mentioned statements and invoice to validate settlement charge code calculations. The EIM Participant should use the mechanism they plan to use at go-live, typically a shadow settlement system. The EIM Participant should also use the Market Simulation period to:
	• Develop EIM settlement validation processes and procedures.

- Develop EIM settlement dispute processes and procedures.

- Identify third party settlement requirements. Validate full setup of the shadow settlement system.

6.3 Parallel Operations

Objective:	After completion of the Parallel Operations period, the EIM Participant should be able to:
	
	 • Validate Daily Initial Market and Monthly Initial Market Settlement Charge Code calculations.
	
	 • Validate Daily Recalculation Market and Monthly Recalculation Market Settlement Charge Code calculations based upon the SQMD data (including Interties) submitted.
	
	 • Identify and validate settlement impacts from Price Corrections.
	
	 • Validate EIM Settlement Invoices.
	
	     o Identify Shadow Settlement System performance metrics.
	
	     o Execute Third Party Settlements, if necessary.

Duration:	The Parallel Operations period is approximately six to eight weeks in duration.
Statement Frequency:	In support of Parallel Operations testing, the CAISO will publish: • Two Daily Initial Market Statements per week (T+4B), • A Monthly Initial Market Statement as specified in Payment Calendar, starting the second week (T+4B), • Two Daily Recalculation Market Statements per week (T+8B), • A Monthly Recalculation Market Statement, starting the third week after meter data submission (T+8B), and • Two Market Invoices.
Validation:	The EIM Participant should use the above-mentioned statements and invoice to validate settlement charge code calculations. The EIM Participant should also use the Market Simulation Period to: • Refine EIM Participants settlement validation processes and procedures,

| | • Refine EIM Participants Settlement dispute process and procedures (including interactions with Third Parties), and |
| | • Generate and Validate Third Party Settlements. |

7.0 EIM Metering and Settlements Timeline
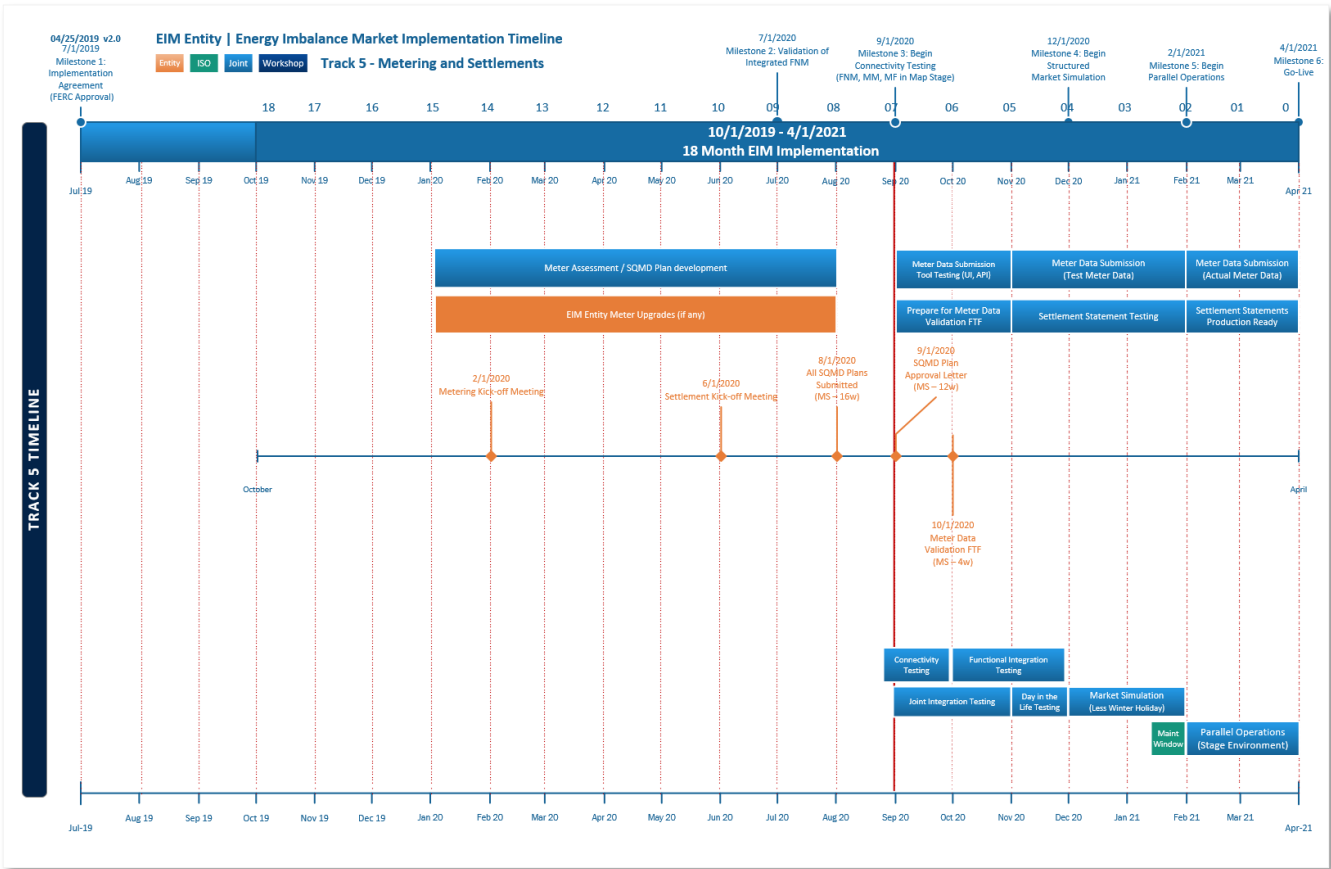
8.0 Track 5 Settlement Key Deliverables

The following are key deliverables required by EIM Participants and the CAISO.

Deliverable	Responsible	Timing	Description of deliverable
Completion of Settlement CBTs modules	EIM Participant	Before Settlement	Required: • Settlements Foundational Concepts

Deliverable	Responsible	Timing	Description of deliverable
		101 and 201 training	• Settlements Validation • Working in MRI-S It is recommended that EIM Participants' settlement teams also take: • Metering Foundational Concepts • Interchange and e-Tags
*Settlement 101 and 201 training	CAISO EIM Participants attend	After completion of functional testing	Described in Section 4.0. *This training is part of Track 6
Settlement Workshop	CAISO EIM Participant attends	Optional	Provided as needed or requested during Day in Life, Market Simulation, and Parallel Operations
Submit Generation Meter Data	EIM Participant	TD+4B 18:00	Per settlement calendar - Description, via API or MRI-S UI
Submit Load Meter Data	EIM Participant	TD+4B 18:00	Per settlement calendar - Description, via API or MRI-S UI
Submit Tie Meter Data	EIM Participant	TD+4B 18:00	Per settlement calendar - Description, via API or MRI-S UI
Settlement Support Info on CMRI	CAISO	TD+1B	Post market data published to CMRI
Settlement Support Info on OASIS	CAISO	TD+1B	Market data published to OASIS
Publish Initial Statement	CAISO	TD+4B	Without meter data
Publish Recalc Statement	CAISO	TD+8B	Includes meter data
Monthly Statement	CAISO	Per Settlement Calendar	Via API or UI in MRI-S
Monthly Invoice	CAISO	Published per settlement calendar	Via API or UI in MRI-S

9.0 Sample Settlement Calendar

The settlement calendar below is a sample settlement calendar. The CAISO will provide a specific calendar like this for each testing phase where settlement statements are provided: Day in the Life, Market Simulation, and Parallel Operations.

California ISO

Market Sim Calendar
Spring 2020 Release

Calendar Day	Day	CMRI T+1B	Publish Initial Statement T+4B	Submit Meter Data by T+4B 18:00 for Recalc	Publish Recalc Statement T+8B	Publish Market Invoice
21-Mar-20	Saturday					
22-Mar-20	Sunday					
23-Mar-20	Monday					
24-Mar-20	Tuesday					
25-Mar-20	Wednesday	24-Mar				
26-Mar-20	Thursday	25-Mar				
27-Mar-20	Friday					
28-Mar-20	Saturday					
29-Mar-20	Sunday					
30-Mar-20	Monday		24-Mar	24-Mar		
31-Mar-20	Tuesday		25-Mar; Monthly Initial 24-Mar - 25-Mar	25-Mar		Daily Initial 24-Mar 25-Mar, Monthly Initial 24-Mar - 25-Mar
01-Apr-20	Wednesday					
02-Apr-20	Thursday					
03-Apr-20	Friday				24-Mar	
04-Apr-20	Saturday					
05-Apr-20	Sunday					
06-Apr-20	Monday				25-Mar, Monthly Recalc 24-Mar - 25-Mar	Daily Recalc 24-Mar, 25-Mar, Monthly Recalc 24-Mar - 25-Mar
07-Apr-20	Tuesday					
08-Apr-20	Wednesday					
09-Apr-20	Thursday					
10-Apr-20	Friday					
11-Apr-20	Saturday					
12-Apr-20	Sunday					

10.0 Things to consider

As the Energy Imbalance Market Settlement has developed over the years, the CAISO Settlement Team has identified some specific "Pain Points" that other EIM Participants have experienced:

- Inaccurate generation meter data will result in higher Uninstructed Imbalance Energy Settlement.

- Inaccurate Intertie meter data will result in inflated Unaccounted for Energy Settlement.

- Inaccurate calculation of ELAP Load meter data can result in high Uninstructed Imbalance Energy Settlement and Over-Scheduling/ Under-Scheduling Charge.

- Submission of After-the-fact Intertie e-tag Schedules including Dynamic System Resources after T+1B will result in High Operation Adjustment and Uninstructed Imbalance Energy Settlement.

- All the above mentioned inaccuracies will have a direct impact on Imbalance Energy Offset Allocations and potential congestion revenue.

- Lack of knowledge of Settlement concepts and calculations may result in delays of identifying and resolving settlement calculation inaccuracies, this may result in not being able to meet dispute timelines.

- Understanding the Expected Energy calculations is essential because the energy is settled based upon energy types.

- Understanding the Commitment Costs is also essential so that EIM's can learn which Bid Costs is considered in BCR when CAISO is committing the resource.

- Understanding of how the market calculates Forecast movement and Uncertainty Awards relationship to fulfill the Flexible Ramp Requirement.

- It is imperative that the day-to-day staff who will manage and run EIM Settlements participate in training, workshops, and Track 5 meetings provided by the CAISO.