EIM Track 5 Overview - Metering

Document Owner: Morris, Janet
## REVISION HISTORY

<table>
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<tr>
<th>VERSION NO. (Must match header)</th>
<th>DATE</th>
<th>REVISED BY</th>
<th>DESCRIPTION</th>
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<tr>
<td>0.1</td>
<td>2/7/17</td>
<td>Joanne Alai</td>
<td>Initial draft</td>
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<tr>
<td>1.1</td>
<td>6/7/17</td>
<td>Mike Russell</td>
<td>Updated SQMD Plan disclaimer captured in section 4 part 3 “Submission of SQMD Plan(s)”</td>
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<tr>
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<td>6/7/17</td>
<td>Mike Russell</td>
<td>Add clarification to section 4 part 3 “Submission of SQMD Plan(s)” to include “selecting to participate as a Scheduling Coordinator Metered Entity”</td>
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<td>1.3</td>
<td>06/23/17</td>
<td>Mike Russell</td>
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<td>Section 4.3a: included SQMD submission process</td>
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<td>Section 4.3b: added Project Loader Information and Link</td>
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<td>Section 4.4: Modified to reflect Review and “Acceptance” step</td>
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<td>Section 4.7: Updated verbiage “approval” to “accepted”</td>
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<td>Section 4.8: Inserted new step reflecting “Approval” of EIM Metering Portfolio step</td>
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<td>Section 6.0 (previously 5.0) “Cross Team Communication” removed “Accellion” references to capture NRI process.</td>
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<td>Section 7.0: Miscellaneous updates to captured Project Loader, SQMD Submission Process, SQMD Approval Letter timing etc.</td>
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<td>1.4</td>
<td>08/01/17</td>
<td>Mike Russell</td>
<td>Combined sections 4.5 &amp; 4.6 associated with EIM Metering Portfolio Validation incorporating existing SQMD Data mapping. Updated section 8 Metering Key Deliverables with modified EIM Metering Portfolio Design and Validation (4.5) and SQMD Data Mapping deliverables.</td>
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<tr>
<td>1.5</td>
<td>08/21/17</td>
<td>Mike Russell</td>
<td>Section 4.3(a): removed Pseudo Ties, Financial Interties, Dynamic Imports and added Intraties; Section 4.5: added “System” resource</td>
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<td>Section 4.6: modified testing and validation parameters to include those of system resources.</td>
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<td>Section 8.0: EIM Metering Portfolio Testing &amp; Validation: added &quot;System&quot; resources.</td>
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<td>1.6</td>
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<td>Mike Russell</td>
<td>Updated verbiage to sections 4.2.3 &amp; 4.2.4 and added links to supporting documentation.</td>
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<td>Updated section 4.3 to captured the required Single Line Diagram (c).</td>
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<td>1.7</td>
<td>9/18/2018</td>
<td>Nancy Strouse</td>
<td>Updated timeline.</td>
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<tr>
<td>1.8</td>
<td>4/29/19</td>
<td>Priyanka Namburi, Ayman Fattah, Cari Chenkin</td>
<td>Updated timeline, verbiage updates. Updated formatting, punctuation, etc.</td>
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1.0 Purpose

This document is meant to provide entities who are joining the Energy Imbalance Market (EIM) with a summary of key metering related requirements and processes to ensure that their settlement quality meter data (SQMD) reflects a high level of meter data accuracy used in the settlement process. This document also identifies key deliverables and general timing to ensure successful Market Simulation and Parallel Operations testing.

2.0 Track 5 Metering Overview

Track 5 contains the various metering activities required to be successful within the Energy Imbalance Market (EIM). There are two elements of metering that are key to ensuring successful metering integration: physical metering and meter data accuracy.

2.1 Physical Metering

Physical metering, associated with a market resource, is the identification and classification of relevant metering components that must be in alignment with Local Regulatory Authority (LRA) requirements, or meet existing CAISO metering standards and accuracy ratings. For resources that do not have an LRA standard which applies for a Market Resource, and have equipment that does not meet the CAISO accuracy requirement, a correction factor may be applied. In support of this effort, all EIM participants choosing to be a Scheduling Coordinator Metered Entity (SCME) for any market resource, must submit a settlement quality meter data (SQMD) plan for each market resource and obtain approval from the CAISO prior to bidding within ISO markets.

2.2 Meter Data Accuracy

The second element captures the steps and measures needed to support a high level of meter data accuracy. Within this section, processes are highlighted to identify validation measures addressing market resource configurations and related metering components in alignment with the market resources physical characteristics and participation level within the EIM.

The elements described in Sections 2.1 and 2.2 are critical in the development and sustainability of accurate and timely submission of SQMD used in settlements.
3.0 Track 5 Metering Timeline (April Go-Live)
4.0 EIM Metering Onboarding

4.1 Introduction
To support accurate and timely submission of SQMD used in settlement processing, the CAISO has developed computer based training (CBT)* modules to assist our customers.

*To obtain CBT access, work with your organization’s User Access Administrator.

4.2 Participation (Track Meetings)
In collaboration with assigned project managers and the EIM entity, the CAISO Metering team will participate in predesignated Track meetings designed to allow the new EIM entity to request clarification on the process and documentation, and ensure a mutual understanding of the entity’s metering configuration.

4.2.1 Kick-Off Meeting
The kick-off meeting will include:
- Introductions, discuss overall objective, related expectations, and project outcomes,
- Determination and establishment of frequency of meetings and required participation levels needed to be successful, and
- Discussion of past practices i.e., lessons learned, potential cost saving measures, and best practices.

4.2.2 EIM Participation
Discuss the EIM entity’s proposed market resources (EIM Portfolio) and participation role (CAISOME vs. SCME). Meetings will take an in-depth review and analysis in identifying participation types (market resources) i.e. generation, interties etc., physical locations vs. modeled participation.

4.2.3 Metering Requirements
Identify and discuss physical metering requirements and options. Topics will include the various processes and related requirements based on participation role CAISO Meter Entity vs. Scheduling Coordinator Meter Entity (CAISOME vs. SCME).

Metering requirements associated with a CAISOME can be found in CAISO End Use Metering Standards and Technical Specifications located under Attachments A & B of the Business Practice Manual for Metering.
Those entities wishing to participate as a SCME must meet the metering standards outlined by their Local Regulatory Authority (LRA). In the absence of a LRA, prospective SCME’s are required to meet or exceed CAISO Metering Standards reference above which can be found at:

https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Metering

### 4.2.4 Meter Data Collection and Processing

Focus on the methods, processes, and supporting systems needed to submit SQMD with the highest level of accuracy in accordance with the Business Practice Manual for Metering Section 6.2 “Settlement Quality Meter Data” which can be found at:

https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Metering

### 4.3 Submission of SQMD Plan(s)

EIM entities selecting to participate as a Scheduling Coordinator Metered Entity (SCME) must submit their SQMD Plans for CAISO review and acceptance. SQMD Plans must be approved before the Scheduling Coordinator may submit bids on its behalf into the CAISO Markets. **CAISOME are not subject to the submission of a SQMD Plan.** (Complete 16-weeks prior to market simulation).

a. EIM entity must submit a SQMD Plan for each SCME market resource identified within their EIM Metering Portfolio following the 5750 Settlement Quality Meter Data (SQMD) Plan – Submission and Approval Process (External). Market Resources include Generation (Participating and Non-Participating), Interties, Intraties and Load.


b. Each SQMD Plan must be associated with a unique CAISO NRI Project Number (used in tracking and customer notifications).

c. Each SQMD Plan requires a supporting Single Line Diagram (SLD) excluding those associated with a “Load” market resource type i.e. DLAP/ELAP.

d. New EIM Onboarding

e. During EIM Onboarding only, the EIM entity will be allowed to submit a spreadsheet (New Resource Implementation Energy Imbalance Market Onboarding Project Loader) representing all market resources IDs within their EIM Metering Portfolio. EIM Entities will be notified by NRI with the related CAISO NRI Project Numbers associated with each Market Resource ID.

4.3.1 Post Onboarding Updates/Additions

EIM entities must complete a Project Details Form and submit it to NRI@CAISO.COM for processing to obtain their unique CAISO NRI Project Number. This process will be followed for SQMD Plan updates or if new SQMD Plans are submitted after CAISO portfolio validation and approval.

http://www.caiso.com/Documents/ProjectDetailsForm.docx

SQMD Plan Templates are to reflect the actual equipment and related processes that will be in place at the time of the EIM Metering Portfolio Testing and Validation.

4.4 Review and Acceptance of SQMD Plans

(COMPLETE 12 WEEKS PRIOR TO MARKET SIMULATION)

The CAISO Metering team will review, validate, and accept the submitted SQMD Plan(s). Questions and clarifications can be addressed via email (NRI process) or during any one of the regularly scheduled Track 5 conference calls.

4.5 EIM Metering Portfolio Design and Validation

(COMPLETE 6 WEEKS PRIOR TO MARKET SIMULATION)

Based on the market resource information obtained from the EIM entity, the CAISO metering team (EDAS) working in collaboration with the EIM entity, will confirm all market and system-related resource information identified within the EIM entities’ Metering Portfolios. EDAS personnel will then compile and create a visual representation “Bubble Diagram” capturing the physical location vs. modeled participation of each individual resource associated with the Entity’s EIM Metering Portfolio to ensure a high level of meter data accuracy.

In preparation for the EIM Metering Portfolio Testing and Validation, the EIM entity shall provide documentation that represents a breakdown of data mapping and/or configurations of all data relationships captured within the entity’s data processing application(s) used in the creation of SQMD associated with market resources identified within their EIM Metering Portfolio.

4.6 EIM Metering Portfolio Testing and Validation

(COMPLETE 4 WEEKS PRIOR TO MARKET SIMULATION)

Once the EIM Metering Portfolio has been confirmed and validated, CAISO and the EIM entity will work together at the EIM entity’s facility to test, validate, and resolve any discrepancies associated with the collection and validation of EIM-related market resources. This includes, but is not limited to:
• Data relationships, supporting calculations, and/or algorithms affiliated with all identified market resources i.e., load calculations, aggregations, etc.,

• Systems associated with the collection and processing of meter data, including Validation, Estimation, and Editing (VEE) practices,

• Unaccounted for Energy (UFE), with and without losses and

• Procedures and controls related to the processing and submission of SQMD to ensure overall accuracy and timely submission in support of accurate settlement statements.

Testing and validation will include those market resources associated with an “accepted” SQMD Plan and any system resources associated with the EIM Metering Portfolio.

4.7 Approval of EIM Metering Portfolio
(Prior to market simulation)

An “Approval” Letter will be provided to the EIM entity after all SQMD Plans associated with their EIM Metering Portfolio have been “accepted” and they have successfully completed their EIM Metering Portfolio Testing and Validation.

4.8 Meter Data Submission
(Day in the Life, Market Simulation and Parallel Ops)

Settlement statements will be created for the first time during Day in the Life testing, and statement creation will continue through Parallel Operations, but with different frequencies.

The EIM entity will be expected to submit meter data according to the predefined timeline outlined in the settlement statement calendar provided in the Market Simulation Plan (available 6 weeks prior to Market Simulation).

Meter data is submitted through the CAISO MRI-S system and can be submitted either through the UI or API.

Prior to the submission of actual meter data to CAISO, EIM entities are required to have successfully completed their testing and validation (EIM Metering Portfolio Testing and Validation) and to have obtained CAISO “Approval” (SQMD Plans) associated with their EIM Metering Portfolio. This will ensure a high level of meter data accuracy before settlement statements based on this actual meter data are generated.

Day in the Life: New EIM entities will typically not utilize actual meter data during the Day in the Life testing phase. However, they may opt to submit meter data as tests to validate the API and UI interfaces, fine-tune their market resource attributes (i.e., naming convention, interval-size etc.), and ensure the data submitted is in the right format and successfully received and processed within settlements. Since this occurs before the EIM Metering
Portfolio Testing and Validation, the data and settlement statements are expected to be less accurate.

a. **Market Simulation:** Meter data for structured and unstructured scenarios will likely be test data to match the tests being conducted. However, *post-validation* actual meter data can be submitted for further validation of the submission process.

b. **In Parallel Operations:** The SC representing the EIM entity is expected to submit SQMD that represents actual live production meter data. Settlement statements will be most accurate, as submissions will mimic production activity. As in production, the CAISO expects the EIM entity to submit meter data for all active market resources per Trade Date.

### 5.0 Support (Meter Data Processing)

The CAISO will provide assistance with meter data and system access related issues associated with processing of SQMD submitted during Day in the Life, Market Simulation, Parallel Operations, Go-Live, and post Production support.

To facilitate such support, the EIM entities will submit CAISO CIDI tickets for each identified issue to ensure that their request gets proper tracking and visibility for a timely resolution.

### 6.0 Cross Team Communication

The CAISO and EIM entity metering teams will meet as needed to coordinate activity and deliverables and clarify expectations.

All questions and issues should be logged in the CAISO CIDI system.

SQMD Plans will be tracked and communicated through the NRI process.

### 7.0 Things to consider

Ensuring a high level of accurate settlement statements requires the timely submission of SQMD representing those EIM market resources supported by procedures that promote good data processing, controls, and knowledgeable meter data acquisition personnel. Listed below are some best practices.
• Set up a service level agreement (SLA) among internal business units, i.e., Meter Technicians, Communication Techs, IT Support, etc., to support the timely submission of meter data.

• Include mechanisms and controls to validate that meter data was submitted accurately and processed successfully within the Market Results Interface – Settlements (MRI-S).

• Understand the meter data relationships within your supporting systems to ensure a high level of meter data accuracy.

8.0 Track 5 Metering Key Deliverables

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

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Responsible</th>
<th>Timing</th>
<th>Description of deliverable</th>
<th>Format</th>
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<tr>
<td>Project Details Form</td>
<td>EIM entity</td>
<td>Prior to submission of SQMD Plan</td>
<td>After initial Onboarding has been approved, the EIM entity must complete a Project Details Form for any subsequent SQMD Plan changes or additions. Submit Project Details Forms to <a href="mailto:NRI@CAISO.COM">NRI@CAISO.COM</a></td>
<td>Project Details Form</td>
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processing to obtain the unique CAISO NRI Project Number.
Expect it to take 2-5 Business days to generate the Project Number.
http://www.caiso.com/Documents/ProjectDetailsForm.docx

| Submit SQMD Plan(s) | EIM entity | 16 weeks prior to start of market simulation | Per Tariff Section 10.3.7.1, all Scheduling Coordinator Metered Entity’s (SCME) associated resources are required to submit an SQMD Plan via the 5750 Settlement Quality Meter Data (SQMD) Plan – Submission and Approval Process (External) - for each market resource they plan to use within the Imbalance Energy Imbalance Market (EIM).
http://www.caiso.com/Documents/SQMDPlanTemplate.docx

SQMD Plan Tutorial
Those entities selecting to participate as a CAISO Metered Entity (CAISOME) will need to follow the current requirements associated with this role. See Metering BPM for more details.
https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Metering

| Review & Acceptance of SQMD Plans | CAISO | 12 weeks prior to start of market simulation | The CAISO Metering team will review, validate, and accept the submitted SQMD Plans. Address any questions and clarification requests via email (NRI process) or during any one of the regularly scheduled Track 5 conference calls. |
| EIM Metering Portfolio Design and Validation (Bubble Diagram) | EIM entity and CAISO | 6 weeks prior to start of market simulation | Working in collaboration with the EIM entity, CAISO EDAS personnel will confirm all related market and system resource information identified within the EIM entities’ Metering Portfolio. Based on this information, EDAS personnel will compile and create a visual representation “Bubble Diagram” capturing each individual resource’s physical location vs. modeled participation within their EIM Metering Portfolio, to ensure a high level of meter data accuracy. | MS Word |
| SQMD Data Mapping | EIM entity | Before EIM Metering Portfolio Testing & Validation | In preparation for the EIM Metering Portfolio Testing and Validation, the EIM entity shall provide certain documentation. This needs to represent a breakdown of data mapping and/or configurations of all data relationships captured within the entity’s data processing application(s) used in the creation of SQMD associated with market resources identified within their EIM Metering Portfolio. | MS Excel or equivalent |
| EIM Metering Portfolio Testing & Validation | EIM entity and CAISO | 4 weeks prior to start of market simulation | EIM entities must perform on-site testing and validation at their facilities. This should consist of all EIM market and system resources utilizing related systems, processes, and personnel responsible for the collection, validation and submission of SQMD. | FTF Meeting |
| SQMD Plan Approval Letter | CAISO | Prior to start of market simulation | CAISO will provide an “Approval” Letter to the EIM entity after all SQMD Plans associated with their EIM Metering Portfolio have been “accepted” and they have successfully completed their EIM Metering Portfolio Testing and Validation. | Letter |
The CAISO must approve a Scheduling Coordinator Metered entity’s SQMD Plan(s) before the Scheduling Coordinator may submit Bids on its behalf into the CAISO Markets.

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<th>Data Submission (Day in the Life, Market Simulation, Parallel Operations)</th>
<th>EIM entity</th>
<th>Based on Predefined Settlement Calendar</th>
<th>Provide Test or SQMD according to predefined testing requirements and timelines. Submit this data via the MRI-S system API or User Interface.</th>
<th>XML or CSV</th>
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