California ISO

Metering Rules Enhancements Stakeholder Initiative

Issue Paper and Straw Proposal

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1 Introduction

The energy landscape has seen dramatic change in recent years: growth in renewables, demand response, energy storage, and distributed energy resources; expansion of regional markets through the energy imbalance market; and the potential integration of other balancing authority areas into the ISO balancing authority area. Along with this change have been advancements in metering technology and developer interest in new and complex metering configurations.

Through prior stakeholder initiatives, the ISO has made considerable effort to review its metering requirements and propose revisions to accommodate some of this change and provide additional flexibility to market participants. Many of these efforts have led to expanded use of Scheduling Coordinator Metered Entities (SCMEs).

The ISO believes that further work is needed to continue this progress and through this initiative will engage with stakeholders to develop and propose additional enhancements to its metering requirements. From the outset, however, it is important to stress that one principle will not change — the need to maintain the high quality and integrity of meter data for market settlements.

The ISO believes that development of enhanced metering requirements will necessitate balancing multiple objectives. These objectives include, among others, reducing cost barriers to participate in the ISO market, accommodating new and complex metering configurations, integrating other BAAs, leveraging local regulatory authority metering requirements, considering existing investments in metering infrastructure and requirements in place today, and maintaining the quality and integrity of meter data used in market settlements.

In this paper, the ISO provides background information on its existing metering requirements and discusses some identified issues associated with these requirements. This paper also includes the ISO's straw proposal on a set of proposed enhancements for stakeholder consideration.

At this early stage in the initiative, the ISO is targeting completion of the policy development phase by September of this year.

2 Background

The ISO tariff defines two types of metered entity, ISO metered entity (ISOME) and SCME. The ISO tariff defines ISOME as:

(a) any one of the following entities that is directly connected directly to the ISO controlled grid:

i. a Generator other than a Generator that sells all of its Energy (excluding any Station Power that is netted pursuant to Section 10.1.3) and Ancillary Services to the Utility Distribution Company (UDC) or Small UDC in whose Service Area it is located;

ii. a metered subsystem (MSS) Operator; or

iii. a UDC or Small UDC; and

(b) any one of the following entities:

i. a Participating Generator;

ii. a Participating Transmission Owner (TO) in relation to its Tie Point Meters with other TOs or Balancing Authority Areas (BAAs);

iii. a Participating Load;

iv. a Participating Intermittent Resource;

v. an Energy Imbalance Market (EIM) Participating Resource that has elected not to be a SCME, with regard to the EIM Resources it specifies that it represents as a ISOME; or

vi. a utility that requests that Unaccounted For Energy (UFE) for its Service Area be calculated separately, in relation to its meters at points of connection of its Service Area with the systems of other utilities.

The ISO tariff defines SCME as an entity that is (1) a Generator, Eligible Customer, End-User, Reliability Demand Response Resource (RDRR), or Proxy Demand Resource (PDR) that is not an ISOME; (2) an EIM Entity; and (3) an EIM Participating Resource that elects to be a SCME with regard to some or all of the EIM Resources it represents.

ISOME and SCME each have their own specific tariff provisions for metering and providing meter data for ISO settlements. Such provisions address required metering equipment, operational certification, meter inspections, meter data processing to ensure Settlement Quality Meter Data (SQMD).

The ISO tariff defines SQMD as "Meter Data gathered, edited, validated, and stored in a settlement-ready format, for Settlement and auditing purposes."[1] ISO market settlement requires SQMD for generation, load and tie resources. The tariff provides the requirements for the processing of raw meter data, obtained from meters, to produce SQMD.

The requirements for processing SQMD differ between ISOMEs and SCMEs. For ISOMEs, the ISO directly acquires the meter data from ISO certified meters and processes the SQMD. For SCMEs, the SC submits the SQMD from meters that meet the metering and metering process requirements of the applicable Local Regulatory Authority (LRA) and submits an annual self-audit report.

ISOME resources require ISO certified meters and installations. The ISO sets the standards and procedures for the registration, certification, auditing, testing, and maintenance of revenue quality meters. The ISO does not accept meter data from ISOMEs unless produced by metering facilities certified in accordance with the ISO tariff and metering BPM and has a current certificate of compliance. The ISO is responsible for taking the raw unedited meter data and performing validation, estimation, and editing (VEE) procedures to produce actual SQMD.

[1] Appendix A of the ISO tariff.

SCMEs, on the other hand, are required to meet the standards of their applicable LRA. The ISO does not accept SQMD relating to SCMEs unless produced by metering facilities certified in accordance with the certification or similar criteria by the relevant LRA.[2] If the LRA has not prescribed any certification criteria for the metering facilities, the certification criteria prescribed for ISOMEs in the metering BPM apply. While adhering to the requirements of the applicable LRA, SCMEs must produce SQMD submitted to the ISO in accordance with the payment calendar for market settlement calculations. At the time of market start-up, this reliance on LRAs enforcing jurisdictional metering standards was practical because LRA standards were already in place and many entities already complied with them; however, as participation in ISO markets expands, uniform (but flexible) standards may be expedient.

All SCs that submit SQMD are required to perform an annual SC self-audit. In this audit, the SC takes all the actions necessary to support an attestation that they have completed the audit and are processing their meter data in accordance with their requirements.

In addition to settling the market for generation and load, the ISO settles Unaccounted for Energy (UFE). UFE is the difference between net Energy delivered and total measured Demand.[3] The difference is generally attributable to metering or modeling errors, theft, or distribution loss deviations. The ISO performs UFE calculations for each of the UDC areas and requires both interties (interfaces between control areas) and intraties (interfaces between UDCs). The ISO acquires this data from ISO certified meters at the intraties and control area interchange checkout data at the interties when ISO certified meters are unavailable.

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[2] The ISO may require SCs to provide it with a copy of any certificate issued by the LRA.

[3] The tariff defines UFE as "The difference in Energy, for each utility Service Area and Settlement Period, between the net Energy delivered into the utility Service Area, adjusted for utility Service Area Transmission Losses, and the total Measured Demand within the utility Service Area adjusted for distribution losses using Distribution System loss factors approved by the Local Regulatory Authority. This difference is attributable to meter measurement errors, power flow modeling errors, energy theft, statistical Load profile errors, and distribution loss deviations. For EIM Market Participants, the CAISO will calculate Unaccounted For Energy based on the EIM Entity Balancing Authority Area instead of the utility Service Area." Appendix A of the ISO tariff.

Exemptions are yet another area of background relevant to this initiative and to the development of metering rules enhancements. The ISO has the authority to grant exemptions from certain ISO metering standards for ISOMEs. Since the ISO market began operations, the ISO has faced numerous requests for metering exemptions from projects configured in a unique manner not contemplated in the ISO tariff. As an example, projects may consist of multiple resources each having a separate power purchase agreement but sharing equipment (such as a step-up transformer or transmission line) and requiring multiple meters to measure power delivered to the ISO from each resource as well as calculate the associated losses. Currently such schemes require exemptions. However, with advancements in the metering technology, revenue meters are now capable of performing complex computations while still maintaining the accuracy and integrity of the data. This suggests the need to consider updating some of these metering rules. For example, allowing ISO revenue meters to communicate with other ISO revenue meters to perform complex computations, calculate losses and then apply the losses on the net output of each resource may be practical. Currently this would require an exemption.

Reviewing and tracking exemption requests for individual meter configuration solutions requires the expenditure of time and resources from both market participants and the ISO. These requests are becoming more frequent as developers look to leverage existing infrastructure when siting their projects and take advantage of advancements in technology. The ISO believes that the present initiative provides an opportunity to reduce the need for many metering exemption requests by providing resources with greater flexibility for unique needs.

3 Initiative Schedule

Milestone	Date
Issue Paper and Straw proposal posted	February 23
Stakeholder web conference	March 3
Stakeholder comments due	March 17
Revised Straw Proposal posted	April 19

Milestone	Date
Stakeholder web conference	April 26
Stakeholder comments due	May 10
Draft Final Proposal posted	June 7
Stakeholder web conference	June 14
Stakeholder comments due	June 28
Board of Governors Meeting	August 31–September 1

4 Straw proposal

The ISO's straw proposal to enhance its metering rules consists of the three elements summarized below. Subsequent sections discuss each element in detail.

1. No *required* changes to existing metered entities. This will allow existing metered entities, whether ISOME or SCME, to maintain compliance with their metering infrastructure and requirements without being required to change to new tariff requirements unless they elect to do so. Submission of an SQMD Plan would not be required for these metering entities (see the third proposal element below).
2. Allow SCs to submit SQMD for all resources. This will provide market participants with greater flexibility by allowing SCs to submit SQMD for load, generation, and intertie/intratie resources. Under this option SCs would be able to:
    a. Acquire, process, and submit SQMD for generation resources they represent.
    b. Acquire, process, and submit SQMD for their load resources by following the requirements of an applicable LRA, or by calculating their load from qualified tie meters and internal generator meters.

c. Process and submit SQMD for tie resources when the interchange checkout data is unavailable.

3. SQMD plan. This element of the proposal ensures that the second element of the proposal will not compromise the integrity of settlement data. Here, SCs that choose to provide SQMD for all resources would be required to develop and submit a Settlement Quality Meter Data Plan (SQMD Plan). The SQMD Plan would indicate how the entity would securely and accurately install, maintain, and calibrate measurement equipment to ensure that data produced, collected, and used in the development of submitted SQMD meets accuracy standards established by the ISO. The SQMD Plan would include identification of processes used in the establishment of submitted SQMD. The SC also would be required to perform an SC self-audit and attest to meeting the requirements of the SQMD Plan and any requirements of an applicable LRA.

In the following subsections, the ISO discusses these proposal enhancements in more detail.

4.1 No required changes to existing metered entities

The ISO believes that existing metered entities, whether ISOME or SCME, should be able to remain as such and maintain compliance with their metering infrastructure and requirements without being required to change to new tariff requirements (unless they elect to do so). Therefore, under this proposal, these metering entities are not required to submit an SQMD Plan (see section 4.3 below) even if they are SCMEs.

For existing metered entities, metering enhancements generally would affect ISOMEs. These entities have already invested in metering infrastructure, communication, and maintenance plans. ISOMEs use ISO meter data processing services to acquire their RQMD and to convert it to SQMD for settlement. As such, the ISO wants to allow these entities to continue with their present practices unless they opt to take advantage of the option described below in section 4.2.[4]

[4] This straw proposal does not address the process involved if an existing metered entity requests to become subject to the new rules. That process will be developed in later papers or in implementation. It suffices here to say that existing entities will be allowed to opt into the new rules if they desire.

Similarly, this proposal respects LRA requirements, such as the use of retail metering to produce SQMD. If the entities the SC represents are under the jurisdiction of an LRA (e.g., CPUC-jurisdictional bundled service customer load), they may continue to process their meter data under their existing requirements.

4.2 Allow SCs to submit SQMD for all resources represented

To provide market participants with greater flexibility, the ISO is proposing to allow SCs the option to submit SQMD for load, generation, and intertie/intratie resources. [5] SCs that elect to take advantage of this option will be required to develop and submit a SQMD Plan.

At this time, the ISO is not proposing to extend this option to metered subsystems (MSSs).[6] MSSs will be required to maintain existing metering requirements, including the metering requirements for MSS intratie meters.

As explained above, entities participating in the ISO market today use one or more of the following three methods to process meter data for use in ISO settlement.

Existing methods

1. ISOME — the ISO acquires the meter data and processes the SQMD.
2. SCME — the SC submits the SQMD from meters that meet LRA approved metering and metering process requirements. The SC submits an annual SC Self Audit Report.
3. Allow the ISO to use the meter flows from approved meters at the interties

[5] The ISO is aware that some power purchase agreements may require a resource to be an ISOME, and therefore many existing and future entities may wish to be ISOMEs.

[6] A MSS is a geographically contiguous system operating as an electric utility for a number of years prior to the ISO market operations as a municipal utility, water district, irrigation district, state agency or federal power marketing authority, subsumed within the ISO BAA, encompassed by ISO certified revenue quality meters at each interface point with the ISO controlled grid and ISO certified meters on all resources internal to the system, and operated in accordance with a MSS agreement.

The ISO is proposing to supplement the existing methods for processing meter data used in ISO market settlement with the following two new methods.

Proposed new methods

4. The SC submits calculated SQMD from meters qualified in their SQMD Plan. The SC uses qualified generator or individual load metering and processes the meter data per their SQMD Plan. For aggregated load values of a default load allocation point (DLAP), the SC calculates the SQMD from qualified tie meters and internal generators. The SC submits an annual SC Self-Audit Report.
5. The SC submits SQMD for tie data from flow meters qualified in their SQMD Plan. The SC submits an annual SC Self-Audit Report.

The ISO has developed the following table to compare the methods each type of entity would use to process meter data under both existing rules and the proposed enhancements. The numbered values in the table refer to the methods outlined in the previous list.

Comparison of Existing Methods for Submittal of SQMD to Proposed New Methods		
Entity Type	Present Requirements	Proposed Options
Generator – Provides regulation and/or AS	1	1, 2, 4
Generator – Provides energy Only (e.g., Diablo Canyon)	1	1, 2, 4
Generator – Provides energy to UDC in whose territory they reside (e.g., QF)	2	2, 4
Generator – Tie Generator – Pseudo Tie	1, 3	1, 3, 4

Load – Individual grid connected	1, 2	1, 2, 4
Load – DLAP	1, 2	1, 2, 4
Load - EIM	2	4
Intertie – BA to BA	3 (a few 1s)	3
Intratie – UDC-UDC	1	1, 5
MSS	1	1
Distributed Energy Resources (DER)	2	2, 4
Demand response (PDR/RDRR)	2	2

4.3 SQMD Plan

To provide market participants with greater flexibility, the ISO is proposing to allow SCs the option to submit SQMD for load, generation, and intertie/intratie resources. To maintain the integrity and quality of meter data used in market settlements, SCs that elect to take advantage of this option will be required to develop and submit a SQMD Plan. These plans will provide SCs with the opportunity to demonstrate to the ISO that the meter data submitted to the ISO will be settlement quality. These SCs also could propose any unique metering configurations they plan to use according to their SQMD Plan.

The ISO will reserve the right to perform audits and inspections on the implementation and use of each SQMD Plan. Any SQMD Plan that proves to be inadequate is subject to revision to ensure it produces SQMD/RQMD.

In addition to the SQMD Plan, the entity will be required to submit an annual self-assessment where its management will attest to the implementation and adherence to

its SQMD Plan. The entity also will be subject to the Rules of Conduct for late or inaccurate meter data.

The ISO proposes the following topics should be included in each SQMD Plan.

- Metering Facility Design. Based on what types of resources the SC is representing, the plan should include important description and information on the design of the generation facility, load calculation, and or tie metering. This may include electrical schematics (one/three line diagrams), identification of supporting equipment (including serial numbers or other applicable characteristics of the equipment), distribution factors, line loss factors, accuracy of equipment, and verification of the adequacy of the design (such as a professional engineers stamp or equivalent).
- Procedures. The plan should provide the procedures used for installation, testing, calibration, maintenance, and security of the metering device, and the processing of the meter data from the meter through the submittal of SQMD.
- Ongoing monitoring and inspection. The plan should describe the program for ongoing monitoring of the health of the metering device and metering facility. The plan should identify mitigating actions for any problems with the equipment. The plan also should establish a testing schedule.
- Meter Data Process. The plan should describe the program that reads the metering device; performs validation, editing, and estimation; applies the appropriate metering factors to create the SQMD file for submission; and verifies timely reception of data. The plan also should identify on-going monitoring of these meter data processes.
- Communication. The plan should describe the system and process used to interrogate the metering device(s), maintain the integrity of the metering data, and transmit the SQMD to the ISO.
- SC Self-Assessment. The plan should describe the procedure used to perform the annual SC self-audit.