

February 8, 2017

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Re: California Independent System Operator Corporation
Docket No. ER17-_____-000**

**Tariff Amendment to Implement Metering Rules Enhancements
Initiative**

Dear Secretary Bose:

The California Independent System Operator Corporation (“CAISO”) submits this tariff amendment to provide additional metering flexibility in the CAISO while maintaining meter data integrity.¹ There was broad stakeholder support for the proposed revisions in the CAISO’s metering rules enhancement policy initiative.²

I. Summary

CAISO market settlement requires settlement quality meter data (“SQMD”) for resources participating in the CAISO’s markets.³ The CAISO tariff defines SQMD as “Meter Data gathered, edited, validated, and stored in a settlement-ready format, for settlement and auditing purposes.”⁴ The CAISO obtains SQMD from two different types of market participants: CAISO metered entities (“CAISOMEs”) and scheduling coordinator metered entities (“SCMEs”).⁵ For CAISOMEs, the CAISO directly polls

¹ The CAISO submits this filing pursuant to section 205 of the Federal Power Act, 16 U.S.C. § 824d. Capitalized terms not otherwise defined herein have the meanings set forth in the CAISO tariff, and references to specific sections, articles, and appendices are references to sections, articles, and appendices in the current CAISO tariff and revised or proposed in this filing, unless otherwise indicated.

²

<http://www.caiso.com/informed/Pages/StakeholderProcesses/MeteringRulesEnhancements.aspx>.

³ It is important to note that these tariff amendments address metering data used for settlement purposes only; not telemetry data used for operations and reliability.

⁴ Appendix A to the CAISO tariff.

⁵ Current definitions of SCME and CAISOME are provided in Section II, below, and in Appendix A to the CAISO tariff.

the meters, and the CAISO performs the validation, estimation, and editing procedures to produce SQMD. For SCMEs, the scheduling coordinator polls the meters, performs the validation, estimation, and editing procedures, and submits the resulting SQMD to the CAISO.

Currently, the tariff requires participating generators and other principally CAISO wholesale market resources to be CAISOMEs; whereas, load, demand response resources, energy imbalance market (“EIM”) participants, and other resources subject to different jurisdictional metering requirements may be SCMEs.⁶ The CAISO’s proposed tariff revisions expand the SCME option to more entities, including participating generators. This expanded optionality will enable market participants to forego certain costs associated with CAISO metered entity status, such as a CAISO approved meter, meter reprogramming to meet standards applicable to CAISOMEs, meter inspection by a CAISO authorized inspector, and certain telecommunication costs. The proposed revisions would have no adverse effects. The CAISO’s proposal also provides that existing metered entities, regardless of type, will have the option to retain current metering requirements and maintain their *status quo*.

The CAISO’s proposed tariff revisions also include new measures to ensure that scheduling coordinators provide the CAISO with accurate SQMD. Scheduling coordinators for new SCMEs will be required to submit an “SQMD plan” for CAISO approval before the scheduling coordinator can submit bids on behalf of the entity. The SQMD plan will detail the metering configurations for the SCMEs the scheduling coordinator represents, including how the scheduling coordinator will configure and program its meters, aggregate and calculate meter data, test its meters, and audit its meter data, all consistent with CAISO tariff and local regulatory authority requirements. The CAISO will review and approve each plan and have auditing and testing rights to ensure continued compliance. In addition, each scheduling coordinator will have to perform an annual self-assessment and affirm to the CAISO that it continues to comply with its plan.

The CAISO’s proposed revisions received broad stakeholder support, and will benefit many market participants by providing additional flexibility and reducing potential barriers to entry. Accordingly, the CAISO requests that the Commission approve the proposed revisions as just and reasonable.

II. Background

In 2016 the CAISO launched the Metering Rules Enhancement initiative to comprehensively re-evaluate the CAISO’s metering requirements, most of which have been in place since the CAISO was established in 1997. The CAISO uses SQMD for billable quantities to represent the energy generated, consumed, or

⁶ *Id.* A full table of the current and proposed resource metering options is provided below.

transferred during a settlement interval. CAISO market settlement requires SQMD for generation, load, and tie resources. As discussed below, CAISOMEs and SCMEs are subject to different tariff provisions for providing meter data for CAISO settlement.⁷

A. CAISOMEs

The CAISO tariff defines a CAISOME as:

- (a) any one of the following entities that is directly connected directly to the CAISO 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 or small utility distribution company in whose service area it is located;
 - ii. a metered subsystem operator; or
 - iii. a utility distribution company or small utility distribution company; and

- (b) any one of the following entities:
 - i. a participating generator;
 - ii. a participating transmission owner in relation to its tie point meters with other transmission owners or balancing authority areas;
 - iii. a participating load;
 - iv. a participating intermittent resource;
 - v. an EIM participating resource that has elected not to be a SCME, with regard to the EIM resources it specifies that it represents as a CAISOME; or
 - vi. a utility that requests that unaccounted for energy (“UFE”)⁸ for its Service Area be calculated separately, in relation to its

⁷ Sections 10.2 and 10.3, respectively of the CAISO tariff; proposed Section 10.1 seeks to explain this distinction explicitly.

⁸ Appendix A to the CAISO tariff defines Unaccounted For Energy 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.”

meters at points of connection of its Service Area with the systems of other utilities.⁹

CAISOMEs generally are either individual or aggregate resources that participate only in the CAISO wholesale markets. As such, they are subject only to Commission and CAISO tariff metering requirements.

The CAISO's revenue meter data acquisition and processing system ("RMDAPS") directly polls each CAISOME's revenue quality meters.¹⁰ The CAISO also retrieves information on the performance and status of the meters (e.g., error logs and back-up battery status). The CAISO takes the raw, unedited meter data and performs the validation, estimation, and editing procedures to produce actual SQMD. The CAISO does not accept meter data from a CAISOME unless that meter data is produced by metering facilities certified by a CAISO authorized inspector.¹¹ The inspector certifies that the meter meets CAISO metering standards for the physical meters themselves, and that those meters are programmed pursuant to CAISO tariff standards.¹² Installing CAISO approved meters and undergoing the certification process can represent significant costs to new resources, particularly smaller resources. However, a CAISOME can mitigate its initial upfront costs can by avoiding the ongoing costs associated with meter data collection, validation, estimation, editing, and submission to the CAISO (because the CAISO itself performs these functions). For variable energy resources that are CAISOMEs, the CAISO also reports output to the Western Electric Coordinating Council ("WECC") for those resources' renewable energy certificate requirements, which saves the resources the cost of doing the reports themselves. In addition, CAISOMEs can avoid rules of conduct penalties for late or inaccurate SQMD (because the CAISO polls the meters instantaneously).¹³ Thus, significant benefits accrue to CAISOMEs.

⁹ Appendix A to the CAISO tariff.

¹⁰ Appendix A to the CAISO tariff defines RMDAPS as "A collective name for the set of CAISO systems used to collect, validate, edit and report on Revenue Quality Meter Data."

¹¹ Section 10.2.5 of the CAISO tariff. The CAISO maintains a list on its website of authorized inspectors, as well as the procedures for applying to become an authorized inspector.

¹² Sections 10.2.2 to 10.2.4 of the CAISO tariff.

¹³ Section 37.5.2 of the CAISO tariff.

B. SCMEs

The current CAISO tariff defines an SCME as an entity that is:

- (a) a generator, eligible customer, end-user, reliability demand Response resource (“RDRR”), or proxy demand resource (“PDR”) that is not a CAISOME;
- (b) an EIM entity; and
- (c) an EIM participating resource that elects to be an SCME with regard to some or all of the EIM resources it represents.¹⁴

Unlike CAISOMEs, SCMEs generally are resources already subject to another jurisdictional entity’s metering standards. The CAISO tariff refers to these other jurisdictional entities as “Local Regulatory Authorities.”¹⁵ For example, end-users and demand response resources,¹⁶ are inherently retail entities subject to state and local metering standards. Likewise, EIM entities may be subject to another balancing authority’s wholesale open-access tariff. As such, the CAISO has provided SCMEs with flexibility in metering standards so long as the CAISO can ensure that the SCME meets its local regulatory authority standards and the additional CAISO standards for SCMEs.¹⁷ The CAISO tariff requires scheduling coordinators to ensure that SCMEs comply with local regulatory authority standards and have all necessary inspections and certificates.¹⁸ The tariff requires scheduling coordinators to provide the CAISO with copies of all necessary certifications upon request.¹⁹ Where the SCME does not have local regulatory authority standards, the CAISO requires the SCME to adhere to CAISO standards.²⁰

The scheduling coordinator for an SCME validates, estimates, and edits the meter data, then submits the data as SQMD directly into the CAISO’s SQMD system (“SQMDS”).²¹ While adhering to applicable local regulatory authority requirements, SCMEs must produce SQMD submitted to the CAISO in accordance with the CAISO’s payment calendar for market settlement

¹⁴ Appendix A to the CAISO tariff.

¹⁵ Appendix A to the CAISO tariff defines Local Regulatory Authority as “The state or local governmental authority, or the board of directors of an electric cooperative, responsible for the regulation or oversight of a utility.”

¹⁶ In the CAISO, demand response resources consist of PDRs and RDRRs.

¹⁷ See, e.g., Sections 10.3.7, 10.3.9, 10.3.11 of the CAISO tariff.

¹⁸ Section 10.3.9 of the CAISO tariff.

¹⁹ *Id.*

²⁰ *Id.*

²¹ Appendix A to the CAISO tariff defines SQMDS as “A collective name for the set of CAISO systems used to accept, analyze and report on SQMD.”

calculations. Scheduling coordinators who fail to submit SQMD accurately and timely may face rules of conduct penalties.²²

All scheduling coordinators that submit SQMD must perform an annual self-audit. In this audit, the scheduling coordinator affirms that it remains in compliance with local regulatory authority and CAISO requirements.

III. Proposed Tariff Revisions

A. Expanded SCME Optionality

The CAISO proposes to expand the pool of entities eligible to be SCMEs.²³ Specifically, the CAISO proposes to allow participating generators, participating intermittent resources, utility distribution companies,²⁴ and tie points to choose whether to be a CAISOME or an SCME. The following table shows every entity's proposed metering eligibility:

Entity Type	Current Eligibility	Proposed Eligibility
Participating Generator	CAISOME	CAISOME or SCME
Qualifying Facility ²⁵	SCME	SCME
Metered Subsystem	CAISOME	CAISOME
Utility Distribution Company	CAISOME	CAISOME or SCME
Utility Distribution Company requesting separate UFE	CAISOME	CAISOME
Tie Point Meters	CAISOME	CAISOME or SCME
EIM entities	CAISOME or SCME	CAISOME or SCME
Participating Load ²⁶	CAISOME	CAISOME

²² See Section 37.5.2 of the CAISO tariff.

²³ Proposed Appendix A definitions for Scheduling Coordinator Metered Entity and CAISO Metered Entity.

²⁴ Excluding utilities that request separate unaccounted for energy calculations, as explained below.

²⁵ At this time, the CAISO is not proposing to expand CAISOME eligibility to resources already afforded SCME eligibility: qualifying facilities, end users, and demand response resources. There was no stakeholder demand for such eligibility, likely because most of these resources are small, subject to retail metering requirements, and/or have already operated and complied with existing SCME requirements for many years. Moreover, the flexibility SCMEs have in configuring their meters certainly allows them to use CAISO approved meters, 5-minute interval programming, and have a CAISO authorized inspector inspect and seal their meters. But doing so would be a disproportionate cost for the size of these resources, hence the lack of demand for CAISOME status.

²⁶ Appendix A to the CAISO tariff defines Participating Load as "An entity, including an entity with Pumping Load or Aggregated Participating Load, providing Curtailable Demand, which

Entity Type	Current Eligibility	Proposed Eligibility
End Users	SCME	SCME
Distributed Energy Resources	SCME	SCME
Demand Response (PDR/RDRR)	SCME	SCME

Allowing generators and other resources to be SCMEs will provide greater flexibility to entities that participate in the CAISO markets.²⁷ New resources choosing to be SCMEs will be able to forego the higher upfront costs associated with CAISO metering and inspection. Resources participating in other markets will be able to participate in the CAISO markets without modifying their existing meters. Existing CAISO resources may choose to move their metering calculations into an existing scheduling coordinator calculation. Allowing generators to be SCMEs will give them the same metering flexibility currently afforded to other suppliers of energy and ancillary services—demand response resources, distributed energy resources, and EIM resources—and thus ensure a level playing field.

To be sure, generators and utility distribution companies may continue to choose to be CAISOMEs as well. In fact, the CAISO expects that the majority of existing CAISOMEs will choose to remain CAISOMEs, and that many new generators will choose to become CAISOMEs. The CAISOME option ensures compliance with CAISO tariff standards, avoids future costs for collecting, validating, and editing the meter data, and avoids the risk of potential rules of conduct penalties for late or inaccurate data. In addition, becoming a CAISOME will avoid the new SQMD plan requirement, explained below.

Where adjacent transmission owners or utility distribution companies that have chosen to be SCMEs cannot agree on the metering configuration of their shared intraties, they will be required to use meters directly polled by the CAISO pursuant to CAISOME rules.²⁸

has undertaken in writing by execution of a Participating Load Agreement to comply with all applicable provisions of the CAISO Tariff.” Participating Loads generally are pumped hydroelectric storage facilities and state-owned water pumps that provide non-spinning reserve.

²⁷ At this time, the CAISO is not proposing to expand SCME eligibility to Metered Subsystems, Participating Loads, or utilities that request their own unaccounted for energy calculation. There was no stakeholder demand for such eligibility, and doing so would present significant technical development issues for the CAISO, Metered Subsystems, and utilities that request their own unaccounted for energy calculations.

²⁸ Proposed Section 10.3.14.1 of the CAISO tariff.

B. SQMD Plan

Although the CAISO believes it is fair and prudent to provide more entities with the flexibility to be SCMEs, the CAISO must ensure that it can maintain the integrity and quality of meter data it has achieved to date. Compared to other regions, the CAISO has enjoyed relatively low unaccounted for energy and neutrality,²⁹ and the CAISO intends to maintain this benefit for its market participants through the SQMD plan requirements. Many new SCMEs may come from jurisdictions with few, if any, metering standards. Where metering standards exist, the local regulatory authority may not have contemplated future participation in the CAISO markets. Accordingly, the CAISO proposes to require any new SCME (regardless of resource type) to develop and submit an “SQMD plan.”³⁰ These plans will describe how the scheduling coordinator will collect, maintain, aggregate, and submit SQMD in accordance with CAISO tariff and, where applicable, local regulatory authority metering and settlement standards. Specifically, SQMD plans will include detailed descriptions of the following, as applicable, for each SCME:³¹

- (1) The type, programming, and configuration of all associated metering devices;
- (2) How the scheduling coordinator or its agent will collect, validate, aggregate, and submit associated meter data;
- (3) Single-line diagrams with professional engineer stamps (or equivalent) depicting the physical elements and relationships among the metering device(s);
- (4) Any calculation or algorithm to derive SQMD from the metering device(s);
- (5) Processes for aggregating individual SCMEs to resource identifications; and
- (6) Plans and schedules to perform regular tests of the metering devices and audit the associated meter data pursuant to CAISO tariff requirements.

²⁹ As explained above, unaccounted for energy is the difference between metered energy delivered and measured demand. The difference is attributable to meter measurement errors, power flow modeling errors, energy theft, statistical Load profile errors, and distribution loss deviations. Neutrality could be considered the settlement equivalent: the difference between charges due from the CAISO to market debtors and amounts due to the CAISO from market creditors. The difference can result from unaccounted for energy, rounding, and different settlement intervals.

³⁰ Proposed Sections 4.5.3.15 and 10.3.7.1 *et seq.*, and Appendix A of the CAISO tariff. SQMD plans will allow SCMEs to comply with existing tariff obligations that require reports or certifications. These obligations now will be effected through the SQMD plan, hence the proposed revisions to Sections 10.3.10.1 and 10.3.11.

³¹ “Each SCME” could include aggregations of SCMEs, such as distributed energy resource aggregations.

The information on these SQMD plans will enable the CAISO to foresee and prevent potential metering or settlement issues and ensure the continued integrity of CAISO meter data.

The CAISO will review each proposed SQMD plan to ensure that the SCME's metering configuration meets all CAISO tariff and business practice manual standards. The Scheduling coordinator may not submit bids on the SCME's behalf until the CAISO has approved the SQMD plan.³² The CAISO also must approve any SCME-proposed modifications to a CAISO-approved SQMD plan. So long as the SCME remains in compliance with its SQMD plan, or where a proposed modification intends to bring the SCME into compliance, the scheduling coordinator may continue to submit bids and meter data while the CAISO reviews proposed SQMD plan modifications.³³ The CAISO believes that this safe harbor for self-reporting potential non-compliance will incentivize SCMEs to alert the CAISO to potential issues.

In addition to the CAISO's various auditing rights for metering configurations and settlement data, the CAISO will have the right to perform audits or inspections to ensure that scheduling coordinators and SCMEs have implemented and comply with their SQMD plans.³⁴ The CAISO will then be able to determine whether the SCME must modify its SQMD plan or is otherwise subject to penalty under the CAISO tariff. If the CAISO concludes that the SCME is not able to bring itself into compliance, the CAISO may require the SCME to convert to a CAISOME.³⁵

The CAISO also proposes to require SCMEs to audit and test their metering facilities with the same frequency as CAISOMEs, namely, every two years. These audits and tests will ensure continued compliance with the CAISO tariff and local regulatory authority requirements.³⁶ In addition, on an annual basis the SCME must perform a self-assessment and affirm to the CAISO that it has implemented and continues to comply with its SQMD Plan.³⁷ Where the SCME performs a self-assessment and determines that it will not be able to affirm its compliance to the CAISO, the SCME must describe the issue to the CAISO and its plan to remedy the issue. The associated scheduling coordinator may continue to submit bids and meter data while the CAISO reviews the plan to remedy the issue.

³² Proposed Section 10.3.7.2 of the CAISO tariff.

³³ Proposed Section 10.3.7.3 of the CAISO tariff.

³⁴ Proposed Section 10.3.7.4 of the CAISO tariff.

³⁵ *Id.*

³⁶ Proposed Section 10.3.10.1 of the CAISO tariff.

³⁷ Proposed Section 10.3.7.5 of the CAISO tariff.

The CAISO and stakeholders agreed that the SQMD plan requirement will not apply to SCMEs that pre-date the SQMD plan requirement.³⁸ These SCMEs have been in compliance with CAISO tariff and local regulatory authority requirements for considerable time, and imposing this new requirement upon them would subject them to significant costs midstream, or even close to retirement for some. These existing resources already complied with current CAISO tariff requirements to certify that they comply with all local regulatory authority standards, or, if they have no local regulatory authority standards, CAISO standards.³⁹ Moreover, existing resources are subject to CAISO audits for ongoing compliance.⁴⁰

As such, the CAISO's proposed tariff revisions state that the SQMD plan requirement will apply only to SCMEs that were not participating as such before the proposed effective date of these tariff revisions. However, if a grandfathered SCME later adds generating capacity, repowers its facilities,⁴¹ or reprograms its meters to use a different meter data interval, the SCME will be subject to the SQMD plan requirement.⁴² This exception to the exemption is appropriate because if market participants that are in compliance change their configuration, the CAISO must be able to ensure their future meter integrity and data quality.⁴³

The CAISO also proposes to include clarifying language for demand response resources already subject to requirements similar to the SQMD plan

³⁸ Proposed Section 10.3.7.1 of the CAISO tariff.

³⁹ Section 10.3.9 of the CAISO tariff.

⁴⁰ Section 10.3.10.2 of the CAISO tariff.

⁴¹ The repowering process allows generators to modernize their generating facilities without a new interconnection request so long as the change will not increase generating capacity or substantially change their electrical characteristics. Repowering generally involves replacing older generating technologies (e.g., removing older generating facilities and replacing them with energy storage). See Section 12 of the CAISO's Business Practice Manual for Generator Management, *available at* <https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Generator%20Management>.

⁴² Proposed Section 10.3.7.1 of the CAISO tariff.

⁴³ For example, a qualifying facility could be an SCME today, and thus not have to file an SQMD plan because the facility has been in operation and in compliance for several years. . . . When this qualifying facility's Existing QF Contract expires, the facility will need to convert to Participating Generator status, but it could still remain an SCME under this proposal. The resource's change from qualifying facility to participating generator would have no effect on its metering configuration or settlement processes, and therefore requiring an SQMD plan would not be warranted. However, if the qualifying facility were to repower its facility—as many qualifying facilities do when their Existing QF Contracts expire—it would not be the same facility that has been in compliance for years, and thus it would need to submit an SQMD plan so the CAISO can ensure it provides the CAISO with SQMD for that newly re-configured facility.

requirement, namely, the demand response registration process.⁴⁴ In practice, the CAISO will provide SQMD plan templates on its website that SCMEs may utilize; however, the demand response resources provide this information through the demand response registration process, which describes the demand response resource, how sub-resources are aggregated and metered, and what calculations and baselines the resource will use.⁴⁵ To avoid confusing demand response providers into believing that they must provide the same information through the demand response registration process and via the CAISO's SQMD plan template, the CAISO has included proposed language clarifying that demand response resources may satisfy the SQMD plan requirement by providing all required information through the demand response registration process.

C. Other Changes

The metering rules enhancement initiative provided the CAISO and its stakeholders with an opportunity to review the CAISO metering requirements comprehensively. Many of these provisions have remained unchanged since the CAISO's inception twenty years ago, and some are now anachronistic. Certain provisions thus require the CAISO to grant and publish several specific configuration exemptions under its tariff authority.⁴⁶ To avoid the need to grant exemptions in the future, the CAISO proposes additional clarifying revisions.

First, the CAISO proposes to update its tariff provisions on metering intervals for SCMEs.⁴⁷ The current CAISO tariff merely provides that scheduling coordinators must ensure that SQMD submitted to the CAISO is in intervals of five (5) minutes for loads and generators providing ancillary services and/or imbalance energy, and one (1) hour for all other SCMEs.⁴⁸ This provision predates both the fifteen-minute market and the CAISO's EIM market. In addition, it does not provide SCMEs *not* providing ancillary services with the ability to submit meter data on a more granular basis.⁴⁹ As such, the CAISO

⁴⁴ Proposed Section 10.3.7.1 of the CAISO tariff.

⁴⁵ See, e.g., Section 4.13.4 of the CAISO tariff.

⁴⁶ Section 10.4 of the CAISO tariff gives the CAISO authority to grant exemptions from compliance with certain metering requirements. It requires the CAISO to maintain on its website the guidelines it follows in reviewing exemption applications. The CAISO also must publish on its website all exemption applications and details of whether the CAISO approved the applications, including its reasons for approval or rejection. Section 10.4.2 of the CAISO tariff.

⁴⁷ CAISOMEs do not require a metering interval requirements because the CAISO polls the meters itself and produces 5-minute intervals for settlement purposes.

⁴⁸ Section 10.3.2.2 of the CAISO tariff.

⁴⁹ The CAISO has issued a class exemption under Section 10.4.2 to allow for more granular submissions. The revision proposed here will allow the CAISO to remove the exemption and provide greater transparency.

proposes to add more specificity to this provision to reflect the granular meter data the CAISO receives. Specifically, the CAISO proposes to require five-minute intervals for EIM interties, loads providing ancillary services, and generators providing ancillary services;⁵⁰ 5-minute or 15-minute intervals for EIM participating resources or for generators not providing ancillary services; and 5-minute, 15-minute, or 60-minute intervals for all other SCMEs.⁵¹ This revision will ensure that the CAISO has sufficiently granular data for settlement purposes, provide flexibility for new and existing resources, and provide transparency in the CAISO tariff. Once an SCME notifies the CAISO of the metering interval programmed into its physical meter, the SCME may not deviate from that interval except by notifying the CAISO of the proposed change. The CAISO also adds clarifying language providing that where the SCME is not generating, consuming, or otherwise participating in the CAISO markets, it need not submit values. In other words, the scheduling coordinator does not need to report zeroes for intervals without activity (e.g., during an outage). No submission will be interpreted as zero for that interval.⁵²

Second, the CAISO proposes to remove language stating that CAISOMEs may submit meter data to the CAISO directly or “via a central data server which collects Revenue Quality Meter Data for various CAISO Metered Entities provided that the central data server does not aggregate or adjust data.”⁵³ As discussed above, CAISOMEs have only used the former option—direct polling by the CAISO. Moreover, there is concern that a third-party central data server for meter data could present security, data integrity, and dispute risks. In any case, the CAISO and stakeholders agreed that the “central data server” language is unnecessary, and the CAISO therefore proposes to remove it.

Third, the CAISO proposes to remove tariff language stating that scheduling coordinators may obtain SQMD relating to the entities they represent by requesting extracts from the CAISO.⁵⁴ The CAISO and stakeholders concluded that this language was confusing and unnecessary. The SCME itself owns the meter data. As such, language implying that the scheduling coordinator needs permission from the CAISO to get the meter data it submitted

⁵⁰ Generally, such loads would be demand response resources.

⁵¹ Proposed Section 10.3.2.2 of the CAISO tariff. The CAISO also proposes to replace language dictating that scheduling coordinators aggregate meter data by LAPs and PNodes with broader language allowing a scheduling coordinator to aggregate meter data for its SCMEs at the applicable market or resource level. The existing language poorly reflects market characteristics of demand response resources and distributed energy resources. The CAISO also proposes to clarify that SQMD may be packaged into kWh or MWh values, in proposed Section 10.3.2.2 and in Section 10.1.3.1.

⁵² *Id.*

⁵³ Section 10.2.6 of the CAISO tariff.

⁵⁴ Section 10.3.2.3 of the CAISO tariff.

is confusing. Moreover, the CAISO does not believe that this is a rate, term, or condition of service, and fully intends to give scheduling coordinators and SCMEs access to their own data whenever requested. As such, the CAISO proposes to remove this provision.

Fourth, the CAISO proposes minor tariff revisions to Section 10 of the tariff that reflect the fact that electronic records suffice and paper copies are not necessary for meter certification or inspection.⁵⁵

Fifth, the CAISO proposes minor revisions to clarify that the CAISO or, more commonly, CAISO authorized inspectors, may seal metering facilities for CAISOMEs.⁵⁶

IV. Stakeholder Process

The stakeholder process that resulted in this filing included:

- The CAISO issuing six issue papers produced;
- Six stakeholder meetings and conference calls to discuss the CAISO papers and the draft tariff provisions; and
- Seven opportunities for stakeholders to submit written comments on the CAISO papers and the draft tariff provisions.⁵⁷

The policies resulting in these proposed tariff revisions received broad stakeholder support. They were presented to the Board on December 15, 2016, where the Board voted unanimously to authorize this filing.⁵⁸

V. Effective Date

Pursuant to 18 C.F.R. § 35.17(b), the CAISO requests an effective date of April 10, 2017, 61 days from this filing.

⁵⁵ Proposed Sections 10.2.4.4 and 10.2.5.2 of the CAISO tariff. To be sure, the CAISO is not proposing less documentation here; only that the documentation can be maintained and communicated electronically.

⁵⁶ Proposed Section 10.2.8.1 of the CAISO tariff.

⁵⁷ All stakeholder materials are available on the CAISO website:
<http://www.caiso.com/informed/Pages/StakeholderProcesses/MeteringRulesEnhancements.aspx>.

⁵⁸ <http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=731A5B22-CFA5-469E-9D1C-98F8904E917B>.

VI. Communications

Correspondence and other communications regarding this filing should be directed to:

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VII. Service

The CAISO has served copies of this filing on the California Public Utilities Commission, the California Energy Commission, and all parties with scheduling coordinator agreements under the CAISO tariff. In addition, the CAISO has posted a copy of the filing on the CAISO website.

VIII. Contents of Filing

In addition to this transmittal letter, this filing includes the following attachments:

Attachment A	Clean CAISO tariff sheets incorporating this tariff amendment
Attachment B	Red-lined document showing the revisions contained in this tariff amendment
Attachment C	Revised draft final proposal
Attachment D	Board memoranda
Attachment E	List of key dates in the stakeholder process

IX. Conclusion

The CAISO's proposed revisions received broad stakeholder support, and will benefit many resources. They will provide additional flexibility for market resources and lower potential barriers to entry. For the reasons set forth above, the CAISO respectfully requests that the Commission accept these proposed tariff revisions as just and reasonable, with an effective date of April 10, 2017.

Respectfully submitted,

/s/ William H. Weaver
Roger E. Collanton
General Counsel
Sidney L. Mannheim
Assistant General Counsel
William H. Weaver
Senior Counsel

Counsel for the California Independent System
Operator Corporation

Attachment A – Clean Tariff Records
Tariff Amendment to Implement Metering Rules
Enhancement Initiative
California Independent System Operator Corporation

4.5.3.15 SQMD Plan

Complying with the SQMD Pan for eligible entities it serves pursuant to Section 10.3.7.

* * * *

10.1 General Provisions

An entity seeking to provide or process Energy, Demand, or Ancillary Services in the CAISO Markets must provide the CAISO with Meter Data. Based upon its eligibility and election, an entity provides the CAISO with either (a) Revenue Quality Meter Data as a CAISO Metered Entity or (b) Settlement Quality Meter Data as a Scheduling Coordinator Metered Entity. Pursuant to Section 10.2, the CAISO directly polls CAISO Metered Entities' certified revenue quality meters to acquire Revenue Quality Meter Data. Pursuant to Section 10.3, Scheduling Coordinators for Scheduling Coordinator Metered Entities collect and provide the CAISO with Settlement Quality Meter Data.

* * * *

10.1.3 Netting

10.1.3.1 Permitted Netting

CAISO Metered Entities and Scheduling Coordinators may, when providing Meter Data to the CAISO, net kWh or MWh values for Generating Unit output and auxiliary Load equipment electrically connected to that Generating Unit at the same point provided that the Generating Unit is on-line and is producing sufficient output to serve all of that auxiliary Load equipment. For example, where a Generating Unit's auxiliary Load equipment is served via a distribution line that is separate from the switchyard to which the Generating Unit is connected, that Generating Unit and auxiliary Load equipment will not be considered to be electrically connected at the same point.

* * * *

10.2.4 Certification Of Meters

10.2.4.4 Certificate of Compliance

If the Metering Facilities satisfy the certification criteria as specified in this CAISO Tariff and in the Business Practice Manuals (after taking into account any exemptions to the certification criteria granted by the CAISO), the CAISO will issue a Certificate of Compliance of those Metering Facilities to the CAISO Metered Entity.

* * * *

10.2.5 CAISO Authorized Inspectors

10.2.5.2 Current Certificates

It is the responsibility of the relevant CAISO Metered Entity to ensure that any inspector it engages to undertake the certification of its Metering Facilities is a CAISO Authorized Inspector at the time of inspection.

* * * *

10.2.6 Metering Communications

The CAISO's RMDAPS shall collect and process Revenue Quality Meter Data made available by CAISO Metered Entities pursuant to Meter Service Agreements for CAISO Metered Entities and the applicable Business Practice Manual. Revenue Quality Meter Data for CAISO Metered Entities shall be made available to the CAISO's RMDAPS as specified in the applicable Business Practice Manual directly by the CAISO Metered Entity. Revenue Quality Meter Data on the CAISO's RMDAPS may be provided or made accessible to other CAISO systems as deemed necessary by the CAISO, subject to the CAISO being satisfied that such access by such authorized uses and/or systems will not adversely affect the security of the data held by the CAISO. CAISO Metered Entities shall ensure that their Metering Facilities are compatible with the CAISO's RMDAPS for these purposes. The CAISO may, at its discretion, exempt a

CAISO Metered Entity from the requirement to make Revenue Quality Meter Data directly available to the CAISO's RMDAPS, for example, where the installation of communication links is unnecessary, impracticable or uneconomic. The CAISO shall maintain the RMDAPS and remedy any faults occurring in such system. Scheduling Coordinators and other authorized users requiring Settlement Quality Meter Data for CAISO Metered Entities may obtain such data by accessing the CAISO's Settlement Quality Meter Data Systems in accordance with the CAISO Tariff and applicable Business Practice Manuals. Scheduling Coordinators and other authorized users shall not poll the CAISO revenue meters for any other purpose, unless specifically authorized in the Meter Service Agreement for CAISO Metered Entities.

* * * *

10.2.8 Security And Meter Data Validation Procedures

10.2.8.1 Meter Site Security

Metering Facilities of CAISO Metered Entities and secondary devices that could have any impact on the performance of the Metering Facilities must be sealed by the CAISO or a CAISO Authorized Inspector.

* * * *

10.3.2.2 Format for Data Submission

Scheduling Coordinators shall submit Settlement Quality Meter Data to the Settlement Quality Meter Data System for the Scheduling Coordinator Metered Entities they represent using one of the CAISO's approved Meter Data Exchange Formats. Subject to any exemption granted by the CAISO, Scheduling Coordinators must ensure that Settlement Quality Meter Data submitted to the CAISO is in intervals of five (5) minutes for EIM Interties, Loads providing Ancillary Services, and Generators providing Ancillary Services. Scheduling Coordinators for EIM Participating Resources or for Generators not providing Ancillary Services may elect to submit Meter Data in 5-minute or 15-minute intervals. Scheduling Coordinators for all other Scheduling Coordinator Metered Entities may elect to submit Meter Data in 5-minute, 15-minutes, or 60-minute intervals. Elections will be recorded by the CAISO, and may not be

deviated from or revised except by application. The elected interval may not be a granularity lower than what may be programmed on the Scheduling Coordinator Metered Entity's physical meter(s) or as specified in the applicable Business Practice Manual.

Each Scheduling Coordinator shall submit Settlement Quality Meter Data in kWh values for all of the Scheduling Coordinator Metered Entities for which it is responsible, aggregated by the applicable market or resource level. Scheduling Coordinators are not required to submit values in the absence of Supply, Demand, or other participation in the CAISO Markets.

* * * *

10.3.7 Meter Standards

10.3.7.1 SQMD Plan

For Scheduling Coordinator Metered Entities that were not participating as such before [[proposed effective date]], or that repower, modify their Meter Data interval, or add generating capacity after [[proposed effective date]], the Scheduling Coordinators must submit an SQMD Plan to ensure that the Scheduling Coordinator will submit and maintain the integrity of Meter Data submitted to the CAISO for that Scheduling Coordinator Metered Entity. The SQMD Plan will describe how the Scheduling Coordinator will collect, maintain, aggregate, and submit Settlement Quality Meter Data in accordance with CAISO Tariff and, where applicable, Local Regulatory Authority metering and settlement standards. SQMD Plans will include detailed descriptions of the following, as applicable, for each Scheduling Coordinator Metered Entity or Scheduling Coordinator Metered Entity aggregation or calculation:

- (1) The type, programming, and configuration of all associated metering devices;
- (2) How the Scheduling Coordinator or its agent will collect, validate, aggregate, and submit associated Meter Data;
- (3) Single-line diagrams with professional engineer stamps (or equivalent) depicting the physical elements and relationships among the metering device(s);
- (4) Any calculation or algorithm to derive Settlement Quality Meter Data from the metering device(s);

- (5) Processes for aggregating individual Scheduling Coordinator Metered Entities and/or Resource IDs; and
- (6) Plans and schedules to perform regular tests of the metering devices and audit the associated Meter Data pursuant to CAISO Tariff requirements.

Proxy Demand Resources and Reliability Demand Response Resources may satisfy this requirement through the demand response registration process.

10.3.7.2 CAISO Review of SQMD Plan

The CAISO must approve a Scheduling Coordinator Metered Entity's SQMD Plan before the Scheduling Coordinator may submit Bids on its behalf in the CAISO Markets.

10.3.7.3 SQMD Plan Modifications

Scheduling Coordinator Metered Entities may propose for CAISO approval modifications to approved SQMD Plans. So long as the Scheduling Coordinator Metered Entity remains in compliance with its existing SQMD Plan, or where the proposed modification intends to bring the Scheduling Coordinator Metered Entity into compliance, the associated Scheduling Coordinator may continue to submit Meter Data for settlement while the CAISO reviews the SQMD Plan modifications.

10.3.7.4 SQMD Plan Audits and CAISO Remedies

In addition to the CAISO's audit rights pursuant to this Section 10, the CAISO may perform audits or inspections to ensure that Scheduling Coordinators and Scheduling Coordinator Metered Entities have implemented and comply with their SQMD Plans. Based on an audit, inspection, or other information, the CAISO will determine whether the Scheduling Coordinator Metered Entity must modify its SQMD Plan or is subject to penalty under the CAISO Tariff, including conversion to a CAISO Metered Entity.

10.3.7.5 Annual Affirmation

In addition to the auditing and testing requirements contained in its SQMD Plan, on an annual basis the Scheduling Coordinator Metered Entity must perform a self-assessment and affirm to the CAISO, in writing, that it has implemented and continues to comply with its SQMD Plan. Where the Scheduling Coordinator Metered Entity performs a self-assessment and determines that it will not be able to affirm its compliance to the CAISO, the Scheduling Coordinator Metered Entity will describe the issue to the

CAISO and its plan to remedy the issue. The associated Scheduling Coordinator may continue to submit Meter Data for settlement while the CAISO reviews the plan to remedy the issue.

* * * *

10.3.10 Requirement For Audit And Testing

10.3.10.1 Audit and Testing by Scheduling Coordinator

At least every two years, each Scheduling Coordinator shall (or engage an independent, qualified entity to conduct) audit and test the Metering Facilities of the Scheduling Coordinator Metered Entities that it represents and the Meter Data provided to the Scheduling Coordinator in order to ensure compliance with all applicable requirements of any relevant Local Regulatory Authority and the Scheduling Coordinator Metered Entity's SQMD Plan. Scheduling Coordinators shall undertake any other actions that are reasonably necessary to ensure the accuracy and integrity of the Settlement Quality Meter Data (actual or Scheduling Coordinator estimated) provided by them to the CAISO.

* * * *

10.3.11 Scheduling Coordinator To Ensure Certification

If the relevant Local Regulatory Authority has not prescribed any certification criteria for the Metering Facilities of a Scheduling Coordinator Metered Entity, the Scheduling Coordinator representing that Scheduling Coordinator Metered Entity must promptly notify the CAISO in writing that no such criteria have been prescribed. Where applicable, this notification may be included in the Scheduling Coordinator Metered Entity's SQMD Plan. Consistent with Section 10.3.9, Scheduling Coordinators of a Distributed Energy Resource Aggregation for which no Local Regulatory Authority criteria have been prescribed for Metering Facilities may self-certify that their Metering Facilities meet the default certification criteria set forth in the CAISO Business Practice Manual or their SQMD Plan.

10.3.11.1 Confirmation of Certification

On the written request of the CAISO, each Scheduling Coordinator must give the CAISO written

confirmation that the Metering Facilities of each Scheduling Coordinator Metered Entity that it represents are certified in accordance with either the criteria of the relevant Local Regulatory Authority, the Scheduling Coordinator Metered Entity's SQMD Plan, and/or the criteria prescribed by the CAISO Tariff and Business Practice Manuals within five (5) Business Days of receiving a request from the CAISO.

* * * *

10.3.14 Approval By LRA Of Security And Validation Procedures

10.3.14.1 UDC and TO Agreements

Each Scheduling Coordinator shall be responsible for obtaining any necessary consent from the UDCs on whose Distribution Systems or the Participating TOs on whose transmission facilities the Scheduling Coordinator has Scheduling Coordinator Metered Entities as is necessary to give effect to the procedures governing Meter Data validation and security and inspection and testing of Metering Facilities.

Scheduling Coordinators must verify with the relevant UDC and/or Participating TO the identity of each Scheduling Coordinator Metered Entity they represent and must notify the UDC and/or Participating TO of any discrepancies of which they become aware. Where UDCs or Participating TOs serve adjacent service areas and have elected to submit Settlement Quality Meter Data at the intratie(s), they will be required to agree on the metering configurations used for submitting Meter Data to the CAISO. If they cannot reach an agreement, the intratie(s) will be required to use revenue quality meters directly polled by the CAISO pursuant to Section 10.2.

* * * *

- CAISO Metered Entity

Pursuant to Section 10.1, an eligible entity that has elected that the CAISO will collect and process its Revenue Quality Meter Data directly from CAISO certified revenue quality meters. Eligible entities include:

- (a) any one of the following entities that is directly connected to the CAISO 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 or Small Utility Distribution Company in whose Service Area it is located;
 - ii. an MSS Operator; or
 - iii. a Utility Distribution Company or Small Utility Distribution Company; and
- (b) any one of the following entities:
- i. a Participating Generator;
 - ii. a Participating TO in relation to its Tie Point Meters with other TOs or Balancing Authority Areas;
 - iii. a Participating Load;
 - iv. a Participating Intermittent Resource;
 - v. an EIM Participating Resource; or
 - vi. a utility that requests that Unaccounted For Energy 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.

* * * *

- Scheduling Coordinator Metered Entity

Pursuant to Section 10.1, an eligible entity that has elected that its Scheduling Coordinator will process and submit its Settlement Quality Meter Data to the CAISO. Eligible entities include:

- i. a Generator, including Participating Generators and QFs;
- ii. a Utility Distribution Company or Small Utility Distribution Company;
- iii. a Participating Intermittent Resource;
- iv. an EIM Entity or EIM Participating Resource;
- v. a Proxy Demand Resource or Reliability Demand Response Resource;
- vi. a Distributed Energy Resource;

- vii. an End User;
- viii. a utility that requests that Unaccounted For Energy for its Service Area be calculated separately, in relation to its meters at points of connection of its Service Area with the system of other utilities; and
- ix. Tie Point Meters with other Transmission Owners or Balancing Authority Areas.

* * * *

- SQMD Plan

A document submitted to the CAISO for Scheduling Coordinator Metered Entities that details how the Scheduling Coordinator will measure, collect, maintain, aggregate, process, and submit Settlement Quality Meter Data in accordance with applicable CAISO Tariff and, where applicable, Local Regulatory Authority metering and settlement standards.

* * * *

Attachment B – Marked Tariff Records
Tariff Amendment to Implement Metering Rules
Enhancement Initiative
California Independent System Operator Corporation

4.5.3.15 SQMD Plan

Complying with the SQMD Pan for eligible entities it serves pursuant to Section 10.3.7.

* * * *

10.1 General Provisions

An entity seeking to provide or process Energy, Demand, or Ancillary Services in the CAISO Markets must provide the CAISO with Meter Data. Based upon its eligibility and election, an entity provides the CAISO with either (a) Revenue Quality Meter Data as a CAISO Metered Entity or (b) Settlement Quality Meter Data as a Scheduling Coordinator Metered Entity. Pursuant to Section 10.2, the CAISO directly polls CAISO Metered Entities' certified revenue quality meters to acquire Revenue Quality Meter Data. Pursuant to Section 10.3, Scheduling Coordinators for Scheduling Coordinator Metered Entities collect and provide the CAISO with Settlement Quality Meter Data.

* * * *

10.1.3 Netting

10.1.3.1 Permitted Netting

-CAISO Metered Entities and Scheduling Coordinators may, when providing Meter Data to the CAISO, net kWh or MWh values for Generating Unit output and auxiliary Load equipment electrically connected to that Generating Unit at the same point provided that the Generating Unit is on-line and is producing sufficient output to serve all of that auxiliary Load equipment. For example, where a Generating Unit's auxiliary Load equipment is served via a distribution line that is separate from the switchyard to which the Generating Unit is connected, that Generating Unit and auxiliary Load equipment will not be considered to be electrically connected at the same point.

* * * *

10.2.4 Certification Of Meters

10.2.4.4 Certificate of Compliance

-If the Metering Facilities satisfy the certification criteria as specified in this CAISO Tariff and in the Business Practice Manuals (after taking into account any exemptions to the certification criteria granted by the CAISO), the CAISO will issue a Certificate of Compliance ~~in respect~~ of those Metering Facilities ~~and provide the original Certificate of Compliance~~ to the CAISO Metered Entity ~~that requested the certification of those Metering Facilities.~~

* * * *

10.2.5 CAISO Authorized Inspectors

10.2.5.2 Current Certificates

-It is the responsibility of the relevant CAISO Metered Entity to ensure that any inspector it engages to undertake the certification of its Metering Facilities ~~holds a current certificate of approval issued by the CAISO which authorizes that inspector to carry out the duties of~~ is a CAISO Authorized Inspector at the time of inspection.

* * * *

10.2.6 Metering Communications

The CAISO's RMDAPS shall collect and process Revenue Quality Meter Data made available by CAISO Metered Entities pursuant to Meter Service Agreements for CAISO Metered Entities and the applicable Business Practice Manual. Revenue Quality Meter Data for CAISO Metered Entities shall be made available to the CAISO's RMDAPS as specified in the applicable Business Practice Manual ~~either~~ directly by the CAISO Metered Entity ~~or via a central data server which collects Revenue Quality Meter Data for various CAISO Metered Entities provided that the central data server does not aggregate or adjust that data.~~ Revenue Quality Meter Data on the CAISO's RMDAPS may be provided or made accessible to

other CAISO systems as deemed necessary by the CAISO, subject to the CAISO being satisfied that such access by such authorized uses and/or systems will not adversely ~~ea~~ffect the security of the data held by the CAISO. CAISO Metered Entities shall ensure that their Metering Facilities are compatible with the CAISO's RMDAPS for these purposes. The CAISO may, at its discretion, exempt a CAISO Metered Entity from the requirement to make Revenue Quality Meter Data directly available to the CAISO's RMDAPS, for example, where the installation of communication links is unnecessary, impracticable or uneconomic. The CAISO shall maintain the RMDAPS and remedy any faults occurring in such system. Scheduling Coordinators and other authorized users requiring Settlement Quality Meter Data for CAISO Metered Entities ~~on whose behalf they Bid~~ may obtain such data by accessing the CAISO's Settlement Quality Meter Data Systems in accordance with the CAISO Tariff and applicable Business Practice Manuals. Scheduling Coordinators and other authorized users shall not poll the CAISO revenue meters for any other purpose, unless specifically authorized in the Meter Service Agreement for CAISO Metered Entities.

* * * *

10.2.8 Security And Meter Data Validation Procedures

10.2.8.1 Meter Site Security

Metering Facilities of CAISO Metered Entities ~~(including communications devices)~~ and secondary devices that could have any impact on the performance of the Metering Facilities must be sealed by the CAISO or a CAISO Authorized Inspector.

* * * *

10.3.2.2 Format for Data Submission

Scheduling Coordinators shall submit Settlement Quality Meter Data to the Settlement Quality Meter Data System for the Scheduling Coordinator Metered Entities they represent using one of the CAISO's approved Meter Data Exchange Formats. Subject to any exemption granted by the CAISO, Scheduling

Coordinators must ensure that Settlement Quality Meter Data submitted to the CAISO is in intervals of five (5) minutes for EIM Interties, Loads providing Ancillary Services, and Generators providing Ancillary Services and/or Imbalance Energy, and one (1) hour for other Scheduling Coordinator Metered Entities. Scheduling Coordinators for EIM Participating Resources or for Generators not providing Ancillary Services may elect to submit Meter Data in 5-minute or 15-minute intervals. Scheduling Coordinators for all other Scheduling Coordinator Metered Entities may elect to submit Meter Data in 5-minute, 15-minutes, or 60-minute intervals. Elections will be recorded by the CAISO, and may not be deviated from or revised except by application. The elected interval may not be a granularity lower than what may be programmed on the Scheduling Coordinator Metered Entity's physical meter(s) or as specified in the applicable Business Practice Manual.

~~Each Scheduling Coordinator shall submit Settlement Quality Meter Data in kWh values for all of the Scheduling Coordinator Metered Entities for which it is responsible, that it schedules aggregated by the applicable market or resource level. Scheduling Coordinators are not required to submit values in the absence of Supply, Demand, or other participation in the CAISO Markets.~~

~~(a) LAPs and PNodes, as applicable; and~~

~~(b) the relevant PNode for Generating Units.~~

~~10.3.2.3~~ **Format for Data Requests**

~~Scheduling Coordinators may obtain Settlement Quality Meter Data relating to the Scheduling Coordinator Metered Entities they represent by requesting extracts from the CAISO's Settlement Quality Meter Data Systems using the Meter Data request formats as published in the Business Practice Manuals. The CAISO will ensure that such data is made available in a timely manner.~~

* * * *

10.3.7 Meter Standards

10.3.7.1 SQMD Plan

For Scheduling Coordinator Metered Entities that were not participating as such before [[proposed effective date]], or that repower, modify their Meter Data interval, or add generating capacity after [[proposed effective date]], the Scheduling Coordinators must submit an SQMD Plan to ensure that the Scheduling Coordinator will submit and maintain the integrity of Meter Data submitted to the CAISO for that Scheduling Coordinator Metered Entity. The SQMD Plan will describe how the Scheduling Coordinator will collect, maintain, aggregate, and submit Settlement Quality Meter Data in accordance with CAISO Tariff and, where applicable, Local Regulatory Authority metering and settlement standards. SQMD Plans will include detailed descriptions of the following, as applicable, for each Scheduling Coordinator Metered Entity or Scheduling Coordinator Metered Entity aggregation or calculation:

- (1) The type, programming, and configuration of all associated metering devices;
- (2) How the Scheduling Coordinator or its agent will collect, validate, aggregate, and submit associated Meter Data;
- (3) Single-line diagrams with professional engineer stamps (or equivalent) depicting the physical elements and relationships among the metering device(s);
- (4) Any calculation or algorithm to derive Settlement Quality Meter Data from the metering device(s);
- (5) Processes for aggregating individual Scheduling Coordinator Metered Entities and/or Resource IDs; and
- (6) Plans and schedules to perform regular tests of the metering devices and audit the associated Meter Data pursuant to CAISO Tariff requirements.

Proxy Demand Resources and Reliability Demand Response Resources may satisfy this requirement through the demand response registration process.

10.3.7.2 CAISO Review of SQMD Plan

The CAISO must approve a Scheduling Coordinator Metered Entity's SQMD Plan before the Scheduling Coordinator may submit Bids on its behalf in the CAISO Markets.

10.3.7.3 SQMD Plan Modifications

Scheduling Coordinator Metered Entities may propose for CAISO approval modifications to approved SQMD Plans. So long as the Scheduling Coordinator Metered Entity remains in compliance with its existing SQMD Plan, or where the proposed modification intends to bring the Scheduling Coordinator Metered Entity into compliance, the associated Scheduling Coordinator may continue to submit Meter Data for settlement while the CAISO reviews the SQMD Plan modifications.

10.3.7.4 SQMD Plan Audits and CAISO Remedies

In addition to the CAISO's audit rights pursuant to this Section 10, the CAISO may perform audits or inspections to ensure that Scheduling Coordinators and Scheduling Coordinator Metered Entities have implemented and comply with their SQMD Plans. Based on an audit, inspection, or other information, the CAISO will determine whether the Scheduling Coordinator Metered Entity must modify its SQMD Plan or is subject to penalty under the CAISO Tariff, including conversion to a CAISO Metered Entity.

10.3.7.5 Annual Affirmation

In addition to the auditing and testing requirements contained in its SQMD Plan, on an annual basis the Scheduling Coordinator Metered Entity must perform a self-assessment and affirm to the CAISO, in writing, that it has implemented and continues to comply with its SQMD Plan. Where the Scheduling Coordinator Metered Entity performs a self-assessment and determines that it will not be able to affirm its compliance to the CAISO, the Scheduling Coordinator Metered Entity will describe the issue to the CAISO and its plan to remedy the issue. The associated Scheduling Coordinator may continue to submit Meter Data for settlement while the CAISO reviews the plan to remedy the issue.

* * * *

10.3.10 Requirement For Audit And Testing

10.3.10.1 Audit and Testing by Scheduling Coordinator

At least every two years, Eeach Scheduling Coordinator shall ~~at least annually conduct~~ (or engage an independent, qualified entity to conduct) audits and tests ~~of~~ the Metering Facilities of the Scheduling Coordinator Metered Entities that it represents and the Meter Data provided to the Scheduling

Coordinator in order to ensure compliance with all applicable requirements of any relevant Local Regulatory Authority and the Scheduling Coordinator Metered Entity's SQMD Plan. Scheduling Coordinators shall undertake any other actions that are reasonably necessary to ensure the accuracy and integrity of the Settlement Quality Meter Data (actual or Scheduling Coordinator estimated) provided by them to the CAISO.

* * * *

10.3.11 Scheduling Coordinator To Ensure Certification

If the relevant Local Regulatory Authority has not prescribed any certification criteria for the Metering Facilities of a Scheduling Coordinator Metered Entity, the Scheduling Coordinator representing that Scheduling Coordinator Metered Entity must promptly notify the CAISO in writing that no such criteria have been prescribed. Where applicable, this notification may be included in the Scheduling Coordinator Metered Entity's SQMD Plan. ~~That Scheduling Coordinator will then be responsible for ensuring that the Scheduling Coordinator Metered Entities it represents obtain and maintain Certificates of Compliance in respect of all of the Metering Facilities of those Scheduling Coordinator Metered Entities in accordance with Section 10.3.9. Scheduling Coordinators must engage a CAISO Authorized Inspector to perform the certification of any Metering Facilities that are to be certified under the CAISO Tariff.~~ Consistent with Section 10.3.9, Scheduling Coordinators of a Distributed Energy Resource Aggregation for which no Local Regulatory Authority criteria have been prescribed for Metering Facilities may self-certify that their Metering Facilities meet the default certification criteria set forth in the CAISO Business Practice Manual or their SQMD Plan ~~and need not engage a CAISO Authorized Inspector to perform the certification of Metering Facilities of Distributed Energy Resources comprising their Distributed Energy Resource Aggregation(s).~~

10.3.11.1 Confirmation of Certification

~~On the written request of the CAISO, each Scheduling Coordinator must give the CAISO written confirmation that the Metering Facilities of each Scheduling Coordinator Metered Entity that it represents are certified in accordance with either the criteria of the relevant Local Regulatory Authority, the~~

Scheduling Coordinator Metered Entity's SQMD Plan, and/or the criteria prescribed by the CAISO Tariff and Business Practice Manuals within five (5) Business Days of receiving a request from the CAISO.

* * * *

10.3.14 Approval By LRA Of Security And Validation Procedures

10.3.14.1 UDC and TO Agreements

-Each Scheduling Coordinator shall be responsible for obtaining any necessary consent from the UDCs on whose Distribution Systems or the Participating TOs on whose transmission facilities the Scheduling Coordinator has Scheduling Coordinator Metered Entities as is necessary to give effect to the procedures governing Meter Data validation and security and inspection and testing of Metering Facilities.

Scheduling Coordinators must verify with the relevant UDC and/or Participating TO the identity of each Scheduling Coordinator Metered Entity they represent and must notify the UDC and/or Participating TO of any discrepancies of which they become aware. Where UDCs or Participating TOs serve adjacent service areas and have elected to submit Settlement Quality Meter Data at the intratie(s), they will be required to agree on the metering configurations used for submitting Meter Data to the CAISO. If they cannot reach an agreement, the intratie(s) will be required to use revenue quality meters directly polled by the CAISO pursuant to Section 10.2.

* * * *

- CAISO Metered Entity

Pursuant to Section 10.1, an eligible entity that has elected that the CAISO will collect and process its Revenue Quality Meter Data directly from CAISO certified revenue quality meters. Eligible entities include:

- (a) any one of the following entities that is directly connected to the CAISO 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 or Small Utility Distribution Company in whose Service Area it is located;

- ii. an MSS Operator; or
- iii. a Utility Distribution Company or Small Utility Distribution Company; and

(b) any one of the following entities:

- i. a Participating Generator;
- ii. a Participating TO in relation to its Tie Point Meters with other TOs or Balancing Authority Areas;
- iii. a Participating Load;
- iv. a Participating Intermittent Resource;
- v. an EIM Participating Resource ~~that has elected not to be a Scheduling Coordinator Metered Entity, with regard to the EIM Resources it specifies that it represents as a CAISO Metered Entity;~~ or
- vi. a utility that requests that Unaccounted For Energy 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.

* * * *

- Scheduling Coordinator Metered Entity

Pursuant to Section 10.1, An eligible entity that has elected that its Scheduling Coordinator will process and submit its Settlement Quality Meter Data to the CAISO. Eligible entities include:

- i. a Generator, including Participating Generators and QFs;
- ii. a Utility Distribution Company or Small Utility Distribution Company;
- iii. a Participating Intermittent Resource;
- iv. an EIM Entity or EIM Participating Resource;
- v. a Proxy Demand Resource or Reliability Demand Response Resource;
- vi. a Distributed Energy Resource;

vii. an End User;

viii. a utility that requests that Unaccounted For Energy for its Service Area be calculated separately, in relation to its meters at points of connection of its Service Area with the system of other utilities; and

ix. Tie Point Meters with other Transmission Owners or Balancing Authority Areas.

~~that is (1) a Generator, Eligible Customer, End-User, Reliability Demand Response Resource, Proxy Demand Response Resource, or Distributed Energy Resource Aggregation that is not a CAISO Metered Entity; (2) an EIM Entity; and (3) an EIM Participating Resource that elects to be a Scheduling Coordinator Metered Entity with regard to some or all of the EIM Resources it represents.~~

* * * *

- SQMD Plan

A document submitted to the CAISO for Scheduling Coordinator Metered Entities that details how the Scheduling Coordinator will measure, collect, maintain, aggregate, process, and submit Settlement Quality Meter Data in accordance with applicable CAISO Tariff and, where applicable, Local Regulatory Authority metering and settlement standards.

* * * *

Attachment C – Revised Draft Final Proposal
Tariff Amendment to Implement Metering Rules
Enhancement Initiative
California Independent System Operator Corporation



California ISO

Metering Rules Enhancements Stakeholder Initiative

Revised Draft Final Proposal

November 1, 2016

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Metering Rules Enhancements (“MRE”) Stakeholder Initiative

Revised Draft Final Proposal

1 Executive summary

The CAISO’s metering rules enhancements (“MRE”) proposal will provide additional metering flexibility to market participants and reduce costs to participate in CAISO markets. The MRE proposal accomplishes this primarily by providing expanded scheduling coordinator metered entity (SCME) optionality to certain market resources that otherwise must be CAISO metered entities (ISOME) today. These new types of SCMEs are in addition to the entities that may be SCMEs today. This expanded SCME optionality will enable additional market participants to forego certain costs associated with ISOME status, such as:

- Use of a CAISO approved meter
- Meter reprogramming to meet ISOME standards
- Meter inspection by CAISO Authorized Inspector
- Telecommunication costs

Under the MRE proposal, existing metered entities (regardless of type) will have the option to retain current metering requirements and maintain their status quo.

Scheduling coordinators that provide settlement quality meter data (SQMD) for new SCME resources they represent would be required to develop and submit a SQMD Plan.

Overall, the MRE proposal provides benefits to:

- Future resources that develop in the current CAISO BAA.
- Existing resources in other BAAs that integrate into the CAISO BAA.
- EIM participating generators.

The CAISO is planning to present this proposal to the CAISO Board of Governors at its December 14-15, 2016, meeting and seek approval to file the necessary tariff revisions with the Federal Energy Regulatory Commission (FERC) in early 2017.

2 Changes from the June 7 draft final proposal

Since publishing the draft final proposal on June 7, 2016, the CAISO has published two supplements to the draft final proposal, held three stakeholder web conferences, and received three rounds of written stakeholder comments.

The following is a high-level summary of the changes the CAISO has made to its proposal as compared to the June 7 draft final proposal.

- Provides additional clarification as to which market resource types are affected by the MRE proposal and which are not; specifically, which are provided expanded SCME optionality and which are subject to the SQMD Plan requirement. See table on pages 15-21.
- Refines how the proposal addresses the possibility of discrepancies or disputes related to SQMD submission at UDC-to-UDC intraday points. See section 6.1.2.1.
- Modifies the meter data interval requirements for new generators not associated with ancillary services opting to be SCME to require that they submit SQMD in intervals of 5 or 15 minutes. See sections 6.1.2.4 and 6.3.2.
- Provides clarification on the topic of unaccounted for energy (UFE). See section 6.1.2.5.
- Refines and clarifies how the CAISO is proposing to revise its tariff to reflect two class exemptions that the CAISO issued in 2014. See section 6.3.2.

- Updates the SQMD Plan. See Attachment A.

3 Introduction

Through prior stakeholder initiatives on specific efforts such as demand response, the energy imbalance market (EIM), and distributed energy resource aggregation (DERA), the CAISO reviewed and revised its metering requirements to support these efforts and provide flexibility to market participants. One outcome of these efforts is that they led to expanded use of scheduling coordinator metered entities (SCME).

With the potential integration of other balancing authority areas (BAAs) in the CAISO BAA, the CAISO launched the metering rules enhancements (“MRE”) initiative in 2016 to develop ways to provide additional metering flexibility and reduce costs to participate in CAISO markets while maintaining the accuracy and integrity of meter data for market settlements. The MRE initiative has achieved this goal through proposed enhancements to the process and procedures used by the CAISO, CAISO metered entities (ISOME), and scheduling coordinators for SCMEs to obtain settlement quality meter data (SQMD) used for the settlement of CAISO markets.¹ Building on the prior initiatives mentioned above, the MRE proposal will further expand use of SCME.

In this paper, the CAISO provides background information on the existing process and procedures used by the CAISO, ISOME, and scheduling coordinators for SCME, to obtain SQMD. This paper presents the CAISO’s revised draft final proposal developed through this initiative. This includes a draft SQMD Plan as Attachment A and a draft SQMD Resource Template as Attachment B.

The CAISO is targeting completion of the policy development phase of this initiative (i.e., seeking approval of the CAISO Board) by the end of this year.

¹ This initiative does not directly address meter or telemetry data used in operations.

4 Background

The CAISO tariff defines SQMD as “Meter data gathered, edited, validated, and stored in a settlement-ready format, for settlement and auditing purposes.”² CAISO market settlement requires SQMD for generation, load, and tie resources. Said another way, SQMD is used for billable quantities to represent the energy generated, consumed or transferred during a settlement interval. The tariff provides the requirements for the processing of raw meter data, obtained from meters, to produce SQMD.

SQMD is obtained from two different sources: ISOMEs (meter data directly processed by the CAISO) and SCMEs (meter data submitted to CAISO by scheduling coordinators). ISOMEs and SCMEs each have their own tariff provisions for metering and providing meter data for CAISO settlements.

4.1 ISOME

The CAISO tariff defines an ISOME as:

- (a) any one of the following entities that is directly connected directly to the CAISO controlled grid:
 - i. a Generator³ 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;

² Appendix A to the CAISO tariff.

³ Capitalized terms not herein defined have the meanings set forth in Appendix A to the CAISO tariff.

- 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.⁴

ISOME revenue quality meters are directly polled by the CAISO's revenue meter data acquisition and processing system (RMDAPS)⁵. The CAISO also retrieves data from the meters that provides information on the health of the meters (e.g., error logs, back up battery status, etc.). The CAISO takes the raw unedited meter data and performs the validation, estimation, and editing (VEE) procedures to produce actual SQMD. The CAISO does not accept meter data from an ISOME unless that meter data is produced by metering facilities certified in accordance with section 10 of the CAISO tariff and section 5 of the Business Practice Manual (BPM) for Metering. An ISOME must sign a meter service agreement for ISOME (MSA CAISOME) with the CAISO. The MSA only applies to those entities that the ISOME represents. Such agreements specify that ISOME make RQMD available to the RMDAPS and identify other authorized users that are allowed to access meter data relating to the ISOME.

4.2 SCME

The CAISO tariff defines an SCME as an entity that is:

⁴ Appendix A to the CAISO tariff.

⁵ Appendix A to the CAISO tariff defines RMDAPS as "A collective name for the set of CAISO systems used to collect, validate, edit and report on Revenue Quality Meter Data."

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.⁶

For SCME, the SC for an SCME submits SQMD directly into the CAISO's settlement quality meter data system (SQMDS).⁷ SCs are responsible for obtaining any necessary approval of the relevant LRA to its proposed security and VEE procedures. The CAISO performs no VEE procedures on the actual or estimated SQMD it receives from SCs for SCME. The CAISO does not accept SQMD relating to an SCME unless produced by metering facilities certified in accordance with the certification or similar criteria prescribed by the relevant LRA.⁸ If the LRA has prescribed no certification criteria for the metering facilities, then the certification criteria prescribed within the Metering BPM or Tariff section 29 (EIM) based on market participation will apply. While adhering to the requirements of the applicable LRA, SCME must produce SQMD submitted to the CAISO in accordance with the ISO's payment calendar for market settlement calculations. All SCs that submit SQMD must perform an annual SC self-audit. In this audit, the SC takes all the actions to support an attestation confirming that they have completed the audit and are processing their meter data in accordance with their requirements. An SC for an SCME must sign a meter service agreement for Scheduling Coordinators (MSA SC). Such agreements specify that SCs require their SCME to adhere to the meter requirements of the CAISO tariff.

4.3 CAISO Responsibilities

The CAISO is responsible for establishing and maintaining the RMDAPS and the SQMD. The CAISO is also responsible for (1) setting standards and procedures for the registration, certification, auditing, testing, and maintenance of revenue quality meters; and (2)

⁶ Appendix A to the CAISO tariff.

⁷ Appendix A to the CAISO tariff defines SQMDS as "A collective name for the set of CAISO systems used to accept, analyze and report on Settlement Quality Meter Data."

⁸ The CAISO may require SCs to provide it with a copy of any certificate issued by the LRA.

establishing procedures for the collection, security, validation, and estimation of meter data affiliated with ISOME.

4.4 Unaccounted for energy

Besides settling the market for generation and load, the CAISO settles unaccounted for energy (UFE). UFE is the difference between net energy delivered and total measured demand.⁹ The difference is attributable to metering or modeling errors, theft, or distribution loss deviations. The CAISO performs UFE calculations for each of the designated utility service areas within its markets.

4.5 Exemptions

Understanding CAISO rules and practices relating to metering requirement exemptions is an important consideration in the development of metering rules enhancements in this initiative. The CAISO has the authority to grant exemptions from certain CAISO metering standards for ISOMEs.¹⁰ The CAISO generally does not grant exemptions from metering standards for SCMEs in today's market except for those participating within the Energy Imbalance Market (EIM). Besides exemptions granted to an individual ISOME, the CAISO may grant exemptions that apply to a class of entities. The CAISO has granted class exemptions for FERC Order No. 764 and for EIM.¹¹ These two class exemptions are

⁹ 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 CAISO tariff.

¹⁰ Sections 10.2.12 and 10.4 of the CAISO tariff.

¹¹ FERC Order No. 764 sought to remove potential barriers to variable energy resources' participation in the national electric markets. *Integration of Variable Energy Resources*, 139 FERC ¶ 61,246 (2012).

discussed further in section 6.3.2 of this paper. The CAISO publishes a list of all exemptions granted in the Metering Exemptions Listing Report.¹²

An example of a common exemption is regarding use of a modem for an ISOME. This may occur when the site has no feasible option for an Energy Communications Network (ECN) connection due to monetary constraints or because high-speed access is not available.

To avoid having to make an exemption request as an ISOME, a new market entity could instead opt to be SCME and submit an SQMD Plan as described in this paper (see section 6.1.3 and Appendices A and B). However, this may not be the best outcome because although some market participants may find ISOME more suitable to their situation, they may opt for SCME to avoid an exemption request. As suggested in previous papers in this initiative, the CAISO believes that certain exemption requests frequently requested and granted may indicate where a change in the associated metering requirements merits consideration. The CAISO explains its proposal to modify one such requirement in section 6.3.1 of this paper.

5 Initiative Schedule

Milestone	Date
Issue Paper and Straw proposal	February 23
Stakeholder web conference	March 3
Stakeholder comments due	March 17
Revised Straw Proposal	April 19
Stakeholder web conference	April 26
Stakeholder comments due	May 10

¹² The Metering Exemptions Listing Report was last updated on April 4, 2016, and is available at: <http://www.caiso.com/Documents/MeteringExemptionsListingReport.pdf>

Milestone	Date
Draft Final Proposal & First Supplement	June 7 & June 16
Stakeholder web conference	June 14
Stakeholder comments due	June 28
Draft Final Proposal Second Supplement	September 1
Stakeholder web conference	September 12
Stakeholder comments due	September 19
Revised Draft Final Proposal	November 1
Stakeholder web conference	November 10
Final stakeholder comments due	November 17
Board of Governors Meeting	December 14-15, 2016

6 Revised Draft final proposal

The CAISO's revised draft final proposal to enhance its metering rules comprises the elements discussed in sections 6.1 through 6.3 below.

6.1 Expanded SCME optionality¹³

The MRE proposal allows SCs to submit SQMD for certain market resource types that under today's rules would need to be ISOMEs.¹⁴ These new types of SCMEs are in addition to the entities that may be SCMEs today. Specifically, the MRE proposal represents new SCME optionality for the following market resource types:

- Generation providing ancillary services
- CAISO BAA generation providing energy only (i.e., not associated with ancillary services)
- Intraties
- Distributed energy resources under a Participating Generator Agreement

The table on pages 15-21 provides a comprehensive comparison of those market resources provided expanded SCME optionality under the MRE proposal to those for which there is no change.

In addition to this expanded SCME optionality, this proposal modifies the meter data interval requirements for CAISO BAA generation providing energy only (i.e., not associated with ancillary services) and EIM participating generators. This is discussed in more detail in sections 6.1.2.4 and 6.3.2.

The CAISO is not proposing to impose any size restrictions on SCMEs; however, existing rules to participate in the CAISO market—such as minimum size—would remain unchanged by this proposal.

¹³ For purposes of this proposal, the phrase “SCME optionality” refers those instances where a market resource type that can only be ISOME today is provided the option of being SCME.

¹⁴ The CAISO is aware that some power purchase agreements may require a resource to be an ISOME, and as a result, there will be existing ISOME that opt to remain as ISOME and some future entities that will opt to be ISOME.

Under the MRE proposal SCs that provide SQMD for new¹⁵ SCME resources they represent would be required to develop and submit a SQMD Plan (note: the same SC may also represent one or more ISOME as well but would not submit an SQMD Plan for the ISOME it represents). This would apply to all new SCMEs, whether or not the particular market resource type could opt to be SCME prior to the MRE proposal. Some exclusions apply for demand response resources; these are discussed in more detail in section 6.1.2.3. 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 developing submitted SQMD meets accuracy and integrity standards established by the CAISO. The SQMD Plan would include identification of processes used in the establishment of submitted SQMD. Beside these new requirements, SCs submitting SQMD for SCME resources they represent would be required to meet all existing SCME metering requirements including an SC self-audit and attest to meeting applicable metering requirements.

SCMEs will not be required to submit similar metering documentation required of an ISOME. However, the metering devices will be required to meet existing LRA and CAISO requirements captured within the Metering BPM or Tariff section 29 (EIM) , as explained within its SQMD Plan.

SCME participation will maintain existing SCME metering requirements, which include the execution of an MSA by the SC responsible for providing its SQMD. Only with ISOME must the resource owner (rather than the SC) execute an MSA.

All meter installation and maintenance requirements for SCME will be retained. However, relevant information and/or supporting documentation will be required in the SQMD Plan (which is submitted by the SC).

The intent of the CAISO proposal is to provide market participants with metering flexibility while continuing to maintain the high level of meter data accuracy and integrity that exists today. Besides current UFE practices, the CAISO will continue to utilize existing controls such as audit and testing of the metering facilities and data handling and processing

¹⁵ As used in this paper “new” means new SCME resources as of the effective date of FERC’s acceptance of the proposed tariff revisions.

procedures of SCs and SCME to ensure that meter data accuracy and integrity is maintained.

The CAISO is proposing that existing SCME requirements will continue to apply, including the existing requirement that each SC shall conduct audits and tests of the metering facilities of the SCME(s) that it represents and the meter data provided to the SC in order to ensure compliance with all applicable requirements of any relevant local regulatory authority (see CAISO tariff section 10.3.10 and BPM section 6.3.1). However, the CAISO also proposes to bring SCME requirements in line with CAISO Metered Entity (ISOME) requirements on testing and auditing, which recommends tests and audits at least once every two years (rather than annually).¹⁶

6.1.1 ISOME/SCME – today vs. under proposal

To recap the discussion from sections 4.1 and 4.2, entities participating in the CAISO market are either ISOME (the CAISO acquires the RQMD, performs VEE and creates SQMD used for settlement) or SCME (the SC submits the SQMD from meters that meet LRA-approved metering and processing requirements). The MRE proposal supplements these existing methods for acquiring and processing meter data used in CAISO market settlement with expanded use of SCME for certain market resource types.

To clarify which types of entities affected by the MRE proposal and which are not, the CAISO has developed the following table to compare ISOMEs/SCMEs today to those under the MRE proposal. The right column of the table highlights where the MRE proposal triggers a change – for example, where new SCME optionality occurs and where entities are subject to the SQMD Plan requirement. The table also includes some proposed changes to meter data submittal intervals for generators providing energy only. Some items in the table are discussed in more detail in subsequent pages.

¹⁶ See Section 3.2.3.8 of the CAISO BPM for Metering.

Comparison of ISOME/SCME today vs. ISOME/SCME under MRE proposal			
Entity Type	Today ¹⁷	MRE Proposal ¹⁸	Change?
Generators providing AS	ISOME (only option)	ISOME (remains available) SCME (available as a new option) ¹⁹	Yes, represents new SCME optionality for generators providing AS. New SCMEs would be subject to the SQMD Plan requirement.

¹⁷ Prior to the effective date of FERC’s acceptance of the proposed tariff revisions implementing the MRE proposal.

¹⁸ As of the effective date of FERC’s acceptance of the proposed tariff revisions implementing the MRE proposal.

¹⁹ The CAISO may have some generators still participating in the Station Power Protocol under Appendix I to the CAISO tariff. These generators may elect to convert to SCME status, but would no longer be able to use the Station Power Protocol.

<p>Generators providing energy only (i.e., not associated with ancillary services)</p>	<p>ISOME (only option for non-EIM entities) SCME (available to EIM entities only)</p>	<p>ISOME (remains available) SCME (available as a new option for CAISO BAA based generators providing energy only; remains available to EIM entities)</p>	<p>Yes, represents new SCME optionality for CAISO BAA generators providing energy only. SCs for these SCMEs must submit SQMD in intervals of 5 or 15 minutes (<u>Note:</u> This is a change; under today’s rules these resources may submit in intervals of 5, 15 or 60 minutes).</p> <p>For EIM participating generators, SCs for these SCMEs must submit SQMD in intervals of 5 or 15 minutes (<u>Note:</u> This is a change; under today’s rules these resources must submit in intervals of 5 minutes).</p> <p>New SCMEs would be subject to the SQMD Plan requirement.</p>
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Comparison of ISOME/SCME today vs. ISOME/SCME under MRE proposal			
Entity Type	Today ¹⁷	MRE Proposal ¹⁸	Change?
Generators providing energy to UDC in whose territory they reside (e.g., QFs)	SCME	SCME	No new SCME optionality. New SCMEs would be subject to the SQMD Plan requirement.
Dynamic Resources	ISOME (Interchange Transaction Scheduler ²⁰) SCME (EIM Real Time Interchange Schedule Data ²¹)	ISOME (remains available) SCME (remains available for EIM entities)	No new SCME optionality. New SCMEs would be subject to the SQMD Plan requirement.
Load: Individual grid connected (e.g., load under a Participating Load Agreement)	ISOME (CAISO BAA and EIM entities)	ISOME (CAISO BAA and EIM entities)	No new SCME optionality.

²⁰ Interchange Transaction Scheduler – Tagged values of Intertie Transactions associated with CAISO BAA. In addition, it has the WECC Interchange Tool (WIT) checkout values of metered energy flows across specific CAISO BAA Interties.

²¹ EIM Real Time Interchange Schedule Data – Tagged values of Intertie Transactions associated with EIM Entity’s BAA. These tagged values are submitted directly by the EIM Entity’s scheduling coordinator.

Comparison of ISOME/SCME today vs. ISOME/SCME under MRE proposal			
Entity Type	Today ¹⁷	MRE Proposal ¹⁸	Change?
Load: DLAP	ISOME (service territories requesting own UFE calculation) SCME (CAISO BAA)	ISOME (remains available to service territories requesting own UFE calculation) SCME (remains available to CAISO BAA)	No new SCME optionality. New SCMEs would be subject to the SQMD Plan requirement.
Load: ELAP (EIM)	ISOME or SCME (EIM entity's choice)	ISOME or SCME (remains EIM entity's choice)	No new SCME optionality. New SCMEs would be subject to the SQMD Plan requirement.
Intertie ²²	ISOME (CAISO BAA) SCME (EIM entities)	ISOME (remains available to CAISO BAA) SCME (remains available to EIM entities)	No new SCME optionality. New SCMEs would be subject to the SQMD Plan requirement.

²² An intertie is a transmission corridor that interconnects the CAISO BAA with another BAA or an EIM Entity BAA with another BAA. No change proposed for interties under MRE proposal.

Comparison of ISOME/SCME today vs. ISOME/SCME under MRE proposal			
Entity Type	Today ¹⁷	MRE Proposal ¹⁸	Change?
Intratie ²³	ISOME (only option)	ISOME (if adjacent UDCs cannot comply with the requirement to submit corresponding meter values) SCME (available as a new option if adjacent UDCs can comply with the requirement to submit corresponding meter values)	Yes, this represents new SCME optionality for intraties but only in instances where adjacent UDCs can comply with the requirement to submit corresponding meter values. New SCMEs would be subject to the SQMD Plan requirement.
MSS ²⁴	ISOME (only option)	ISOME (only option)	No new SCME optionality.

²³ An intratie is a metering point between two adjacent utility service areas or utility distribution companies (UDCs) within the CAISO BAA.

²⁴ The CAISO is not proposing to extend this option to metered subsystems (MSS). MSS will be required to maintain existing metering requirements.

Comparison of ISOME/SCME today vs. ISOME/SCME under MRE proposal			
Entity Type	Today ¹⁷	MRE Proposal ¹⁸	Change?
Distributed Energy Resources (DER) / Distributed Energy Resource Aggregations (DERA)	<p>ISOME (DER under a Participating Generator Agreement)</p> <p>SCME (DER aggregations under a DER Provider Agreement)</p>	<p>ISOME (remains available to DER under a Participating Generator Agreement)</p> <p>SCME (available as a new option for DER under a Participating Generator Agreement)</p> <p>SCME (DER aggregations under a DER Provider Agreement)</p>	<p>Yes, this represents new SCME optionality for DER under a Participating Generator Agreement.</p> <p>New SCMEs would be subject to the SQMD Plan requirement.</p>
Demand response (PDR/RDRR)	SCME (only option)	SCME (only option)	<p>No new SCME optionality.</p> <p>New SCMEs would be subject to the SQMD Plan requirement in instances where the LRA is silent on a certification criteria for meter data used in calculating the Demand Response Energy</p>

Comparison of ISOME/SCME today vs. ISOME/SCME under MRE proposal			
Entity Type	Today ¹⁷	MRE Proposal ¹⁸	Change?
			Measurements derived from an CAISO approved performance evaluation methodology. See section 6.1.2.3 of this paper for more discussion.

6.1.2 Additional clarification of proposal

6.1.2.1 Intraties

Earlier in this initiative, PacifiCorp expressed concern about the possibility of discrepancies or disputes related to SQMD submission at UDC-to-UDC intratie points: If the two adjacent UDCs cannot agree on the metering used and instead opt to use their own independent meters, then the SQMD submitted by these two adjacent UDCs may not align. To address this concern the CAISO issued a supplement to the draft final proposal on June 16. This revised draft final proposal incorporates the proposal contained in the June 16 supplement.

Under the CAISO's proposal, if adjacent utility service areas or UDCs elect to submit SQMD at the intratie (rather than making the "intratie" an ISOME market resource), they will be required to agree on the metering used for SQMD submission and agree on who will be responsible for submitting the corresponding meter values. In other words, the metering data between the two metering sources must align. If they cannot comply with this requirement through bilateral coordination, then the metering used at the intratie must be a CAISO certified meter, and the data will be collected and processed by the CAISO on behalf of the adjacent utility service areas or UDCs. This will allow both utility service areas or UDCs to have access to the meter data overseen by the ISO.

The following summarizes the two intratie options available to adjoining UDCs under the CAISO proposal:

1. If two adjoining UDCs within the CAISO BAA agree upon the value and data submission responsibility representing energy flows between them, then the metering used at the intratie may be SCME and the meter data submitted by one of the SCs may be SQMD.
2. If two adjoining UDCs within the CAISO BAA cannot agree upon the value and data submission responsibility representing energy flows between them, then the resource will remain and/or become an ISOME where the metering and communications are the shared responsibility of one or both of the adjoining UDCs; but, data is collected, validated, and submitted by the CAISO.

6.1.2.2 DER/DERA

Since the start of the CAISO market, there have been examples of distribution-connected generation participating in the CAISO market. Up until 2016 these were only interconnected through a participating transmission owner's wholesale distribution access tariff (WDAT), possess an executed Participating Generator Agreement (PGA) with the CAISO, and are ISOME.

In fall 2016, the CAISO implemented the new, additional framework enabling distributed energy resource aggregations (DERA) to participate in CAISO markets.²⁵ The aggregator representing a DERA (the defined term is DER Provider or DERP) has an executed DERP Agreement (DERPA) with the CAISO and the market resource is SCME.

Under the MRE proposal, new SCME optionality is provided to distribution-connected generation under a PGA as well.

6.1.2.3 Demand response (PDR/RDRR)

SCME policy developed for proxy demand resources (PDR) and reliability demand response resources (RDRR) leveraged tariff provisions for Metering Facilities²⁶ that were already in place and under the jurisdiction of a Local Regulatory Authority. CAISO tariff section 10.3.9 sets out the requirement for the SC to ensure that revenue meters and related Metering Facilities of SCMEs they represent are certified in accordance with any certification criteria prescribed by the relevant LRA. Section 10.3.9 also provides that the SC must promptly provide copies of all certificates issued by the relevant LRA upon request of the CAISO.

In cases where the PDR/RDRR applies a performance evaluation methodology using LRA approved load metering, an SQMD Plan is not necessary and for some cases, as in the case of a PDR/RDRR consisting of thousands of small commercial or residential customers, a burden to develop and submit for metering facilities installed and maintained by the customers local utility and not necessarily the Demand Response Provider (DRP).

²⁵ Section 4.17 of the CAISO tariff.

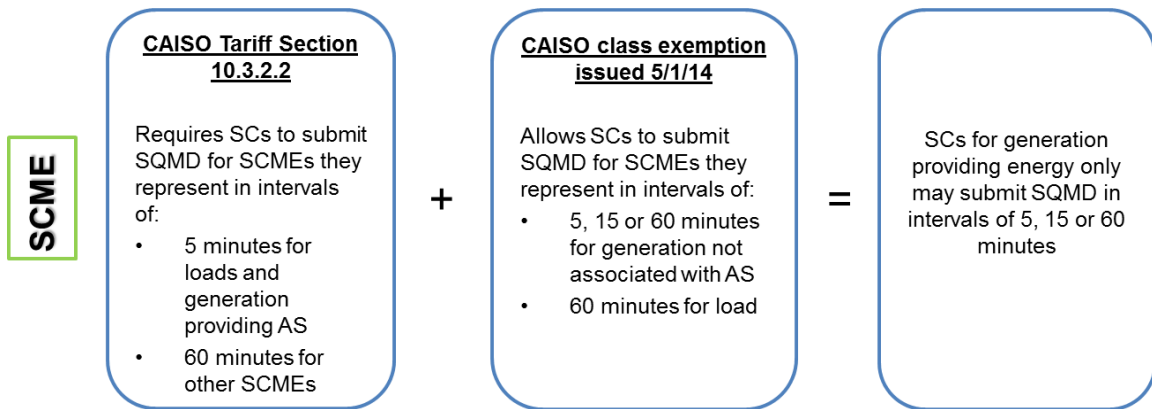
²⁶ Capitalized terms not herein defined have the meanings set forth in Appendix A to the CAISO tariff.

However, the SQMD Plan would be applicable for PDR/RDRR in cases where the LRA is silent on a certification criteria for meter data used in calculating the Demand Response Energy Measurements derived from a CAISO approved performance evaluation methodology. Provisions under tariff section 10.3.11 include that “If the relevant Local Regulatory Authority has not prescribed any certification criteria for the Metering Facilities of a Scheduling Coordinator Metered Entity, the Scheduling Coordinator representing that Scheduling Coordinator Metered Entity must promptly notify the CAISO in writing that no such criteria have been prescribed. That Scheduling Coordinator will then be responsible for ensuring that the Scheduling Coordinator Metered Entities it represents obtain and maintain Certificates of Compliance in respect of all of the Metering Facilities of those Scheduling Coordinator Metered Entities in accordance with Section 10.3.9.” The SQMD Plan requirement would be an extension of this provision.

6.1.2.4 Meter data intervals

Today, meter data of ISOMEs must be recorded at 5-minute intervals (CAISO tariff section 10.2.9.2). The MRE proposal does not change this; the 5-minute requirement will remain in place for ISOMEs. Furthermore, ISOMEs opting for the expanded SCME optionality offered by the MRE proposal (i.e., for those specific market resource types provided the new SCME optionality) will be required to continue recording meter data at 5-minute intervals.

For SCMEs today, interval requirements vary depending on the resource type. CAISO tariff section 10.3.2.2 requires SCs to submit SQMD for SCMEs they represent in intervals of 5 minutes for loads and generation providing ancillary services, and 60 minutes for other SCMEs. Added to this is the class exemption issued by the CAISO on May 1, 2014, which allows SCs to submit SQMD for SCMEs they represent in intervals of 5, 15, or 60 minutes for generation not associated with ancillary services, and 60 minutes for load. Taken together, this means that a subset of these—SCs for generation providing energy only—may submit SQMD in intervals of 5, 15, or 60 minutes. This is illustrated by the diagram below.



The subset of generators providing energy only is relevant in the context of the MRE proposal because for non-EIM generators providing energy only today these must be ISOME (and record their meter data at 5-minute intervals), but under the MRE proposal could opt to be SCME, and without a proposal modification here could submit SQMD in intervals of 5, 15, or 60 minutes. In the CAISO’s view this is concerning because it would have the unintended consequence of expanding the proportion of market participants not submitting SQMD in intervals of 5 minutes. The CAISO both dispatches resources and settles with those resources on a 5-minute basis (per FERC Order No. 764). Aligning the measurement and submittal of SQMD with this same 5-minute basis results in higher accuracy of the payments (or charges) to the resource and a corresponding lowering of any necessary offset allocations. To strike a balance, the CAISO is proposing that new non-EIM energy-only generators opting to be SCME must submit SQMD in intervals of 5 or 15 minutes (thus, this will eliminate the ability to submit in intervals of 60 minutes). By extension, the CAISO is proposing that new EIM participating generators (by definition these are energy only) opting to be SCMEs may submit SQMD in intervals of 5 or 15 minutes (thus, not required to submit only on a 5-minute intervals basis). This will treat all energy only generators opting to be SCMEs on a similar basis.

6.1.2.5 Unaccounted for Energy (UFE)

UDCs and other utilities with CAISO certified metering points of connection between their Service Areas²⁷ and the systems of other utilities can request and receive separately

²⁷ Capitalized terms not herein defined have the meanings set forth in Appendix A to the CAISO tariff.

calculated UFE (see CAISO Tariff Section 10.2.1.1 and Appendix A). UDCs and other utilities with a separate UFE calculation will schedule Load to the load aggregation point (LAP); however, the metered Load will be assigned to the appropriate UDC for purposes of UFE calculation.

For those UDCs and other utilities with CAISO certified metering points of connection between their Service Area and the systems of other utilities that request and receive separately calculated UFE, such market participants can elect to submit SQMD for one or all related market resources (generation, intraties, load). This option will require the representing SC to submit SQMD for the corresponding Load market resource.

6.1.2.6 Load values

The SC submits calculated SQMD from metering devices qualified in its SQMD Plan. For aggregated load values of a default load allocation point (DLAP or ELAP), the SC may calculate their SQMD from qualified tie and generator metering devices. One stakeholder questioned whether this proposed new method means that the CAISO will accept a calculated value for load from LSEs. In response, the CAISO clarifies that only EIM entities and those ISOME affiliated with MSS and/or electing their own UFE calculation have their load derived today and used in settlements. The CAISO proposes that it will accept the method approved by the LRA or CAISO, which is in an approved method outlined within the SQMD Plan.

6.1.3 SQMD Plan

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 CAISO that the meter data submitted to the CAISO will be settlement quality. These SCs also could propose any unique metering configurations they plan to use according to their SQMD Plan.

The CAISO 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 will be subject to revision to ensure it produces SQMD.

A draft SQMD Plan is included as Attachment A to this paper. A draft SQMD Resource Template is included as Attachment B. As part of the SQMD Plan, entities would provide information on each resource using the SQMD Resource Template.

Besides 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 CAISO is suggesting that it have 20 business days to review a submitted SQMD Plan. This review would begin upon receipt of a complete SQMD Plan.

Besides adhering to the annual SC Self-Audit Report,²⁸ all other related plans (SQMD Resource Templates) that provide specific market resource information will need to be re-evaluated when there is a modification to the existing approved SQMD Resource Template or when data submission practices warrant additional review by the CAISO based on inconsistent and/or abnormal meter data submitted by the market participant use in settlement processing.

A professional engineer's stamp or equivalent is required on single line diagrams provided as supporting material with the exception of those Non-Participating Generators within EIM where Issued for Construction, As-Built schematics are acceptable. This information ensures the overall quality of the diagram needed to make the correct assessment. This practice is currently an existing standard within the CAISO BAA market.

The CAISO proposes that in the absence of metering standards set by a local regulatory authority, all related equipment/devices must meet or exceed the standards for ISOME listed within the Metering BPM Attachment A and B. At this time, with the help of the market participants, the CAISO is looking to leverage some of the existing meter standards captured in Metering BPM Attachments A and B to promote a high level of meter integrity

²⁸ Capitalized terms not herein defined have the meanings set forth in Appendix A to the CAISO tariff.

and data accuracy. Metering BPM Attachments A and B reference physical metering elements and should not be misconstrued with SQMD data submission practices.

A concern previously expressed by SCE was that the MRE proposal may cause many metering designs and specifications throughout the CAISO grid. SCE expressed that this may become a problem if the resource must switch SCs because the new SC may not be compatible with the resource's metering equipment. SCE further argued this could become a problem if the LSE becomes a default provider of SC services and could create an unfair cost burden to the LSE if it had to adapt to one-off meter configurations. In its response in the April 19 revised straw proposal, the CAISO explained its view that this result seems very unlikely. As explained in section 4.5.4.6 of the CAISO tariff, the CAISO maintains a list of available SCs for each UDC territory. The UDC is only the SC of last resort. A market participant without an SC would have myriad other SCs to select from. If this scenario were to occur, the CAISO would work with the new SC to determine a method to accomplish the gathering and processing of the meter data to meet the tariff requirements.

6.2 No required changes to existing metered entities

The MRE proposal provides existing metered entities the option to retain current requirements and maintain their status quo, or instead to opt for the expanded SCME optionality where applicable. 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.

The CAISO proposes that existing metered entities, whether ISOME or SCME, should be able to maintain their existing compliance status without being required to change to new tariff requirements. Therefore, under this proposal, these existing metering entities are not required to submit an SQMD Plan even if they are SCMEs. However, SCMEs that opt to add additional capacity or repower their facilities will be required to submit an SQMD Plan upon the completion of their modifications.

Existing ISOMEs have already invested in metering infrastructure, communication, and maintenance plans. The CAISO proposal will allow these entities to continue with their

present practices unless they opt to take advantage of the options provided in this proposal.²⁹

Similarly, this proposal respects LRA requirements. 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.

An existing ISOME possessing an exemption from metering requirements may continue or opt to become an SCME. If this ISOME opts to become an SCME, then what was a meter exemption under ISOME must be documented in the SQMD Plan.

Following implementation of this proposal all new market participants, including those electing to participate within EIM, that choose the SCME option would not need to request an exemption from CAISO metering requirements for a resource, but would instead submit an SQMD Plan.

6.3 Exemption issues

6.3.1 Modifications to certain ISOME requirements

Tariff section 10.2.6 describes that revenue quality meter data (RQMD) shall be provided to the ISO's RMDAPS directly and that the CAISO may exempt an entity from this requirement if the installation of communication links is unnecessary, impracticable or uneconomic. The CAISO proposes to revise the language to allow communication of meter data to the ISO's RMDAPS via a method that assures the confidentiality and integrity of the data.

6.3.2 Modifications to certain class exemptions previously granted

Tariff section 10.3.2.2 states, "Subject to any exemption granted by the ISO, Scheduling Coordinators must ensure that Settlement Quality Meter Data submitted to the CAISO is in intervals of five (5) minutes for Loads and Generators providing Ancillary Services

²⁹ This proposal does not address the process involved if an existing metered entity requests to become subject to the new rules. That is a business process that would be developed during implementation. It suffices here to say that existing entities will be allowed to opt into the new rules if they desire.

and/or Imbalance Energy, and one (1) hour for other Scheduling Coordinator Metered Entities.”

The CAISO has granted two class exemptions effective indefinitely that are relevant to these interval requirements.³⁰

On May 1, 2014, the CAISO granted a class exemption allowing SCs and other entities submitting meter data for either generation not associated with ancillary services, flow gates (interties), or load, to submit meter data in the following granularity levels not already stated in tariff section 10.3.2.2:

- a. Generation at 5, 15, or 60-minute intervals.
- b. Load at 60-minute intervals.

This class exemption only applies to SCs who submit SQMD. This election would be a one-time change, and the resource will maintain that interval granularity unless a meter or meter program change requires a future adjustment. Further, granularity levels cannot be changed to a granularity lower than what is programmable within the resources' individual meters. The CAISO granted this class exemption after FERC Order No. 764, which sought to enable variable energy resources to participate more in the wholesale energy and ancillary services markets.

On November 1, 2014, the CAISO granted a class exemption allowing SCs and other entities submitting meter data related to EIM resources for either generation not associated with ancillary services, flow gates (interties), or load, to submit meter data in the following granularity levels not already stated in tariff section 10.3.2.2:

- a. Generation for participating generators at 5-minute intervals; non-participating generators at 5, 15, or 60-minute intervals.
- b. Flow gates (interties) at 5-minute intervals.
- c. Load at 5, 15, or 60-minute intervals.

This class exemption only applies to SCs who submit SQMD for EIM related resources. This election would be a one-time change and the resource will maintain the granularity unless a meter or meter program change requires a future adjustment. Granularity levels

³⁰ <https://www.caiso.com/Documents/MeteringExemptionsListingReport.pdf>.

cannot be changed to a granularity lower than what is currently programmable within the individual meters.

In general, these class exemptions allow submittal of meter data at an interval level that is *more* granular than otherwise permitted under tariff section 10.3.2.2, which only contemplates a 60-minute interval for load and resources not providing imbalance energy or ancillary services. Under these exemptions, load and generation not already required to submit meter data in 5-minute intervals could elect to do so or to provide meter data in 15-minute or 60-minute intervals as well.

In the June 7 draft final proposal, the CAISO proposed to revise its tariff such that the rule in tariff section 10.3.2.2 is consistent with these class exemptions. In the September 1 second supplement, the CAISO proposed to phase out these two class exemptions and require a transition to SQMD submittal in intervals of five minutes.

After further consideration, the CAISO believes its June 7 proposal is the better one when combined with the proposal aspect previously discussed in section 6.1.2.4 of this paper. Thus, in this revised draft final proposal the CAISO is proposing to revise its tariff such that the rule in tariff section 10.3.2.2 is consistent with these two class exemptions and the modifications previously discussed in section 6.1.2.4 of this paper. Doing so will provide greater clarity on actual CAISO practice, help the CAISO enforce meaningful SQMD submission requirements, and avoid further exemptions to Section 10.3.2.2.

To help clarify its proposal on this topic, the CAISO has included here for stakeholder consideration its draft proposed changes to tariff section 10.3.2.2.

10.3.2.2 Format for Data Submission

Scheduling Coordinators shall submit Settlement Quality Meter Data to the Settlement Quality Meter Data System for the Scheduling Coordinator Metered Entities they represent using one of the CAISO's approved Meter Data Exchange Formats. Subject to any exemption granted by the CAISO, Scheduling Coordinators must ensure that Settlement Quality Meter Data submitted to the CAISO is in intervals of five (5) minutes for Loads **providing Ancillary Services and/or Imbalance Energy** and Generators providing Ancillary Services and/or Imbalance Energy, ~~and one (1) hour for other Scheduling Coordinator Metered Entities,~~ and in intervals of five (5) or fifteen (15) minutes for Generators not associated with Ancillary Services. All other Scheduling Coordinator Metered Entities may elect to provide Meter Data in 5-minute, 15-minute, or 60-minute

intervals. Elections will be recorded in the CAISO Master File, and may not be deviated from or revised except through the Master File revision process. The elected interval may not be a granularity lower than what is programmed on the Scheduling Coordinator Metered Entity's physical meter(s) or as specified in the applicable Business Practice Manual. Where the Scheduling Coordinator does not provide Meter Data in 5-minute intervals, the CAISO will calculate the submitted interval granularity to reflect the 5-minute value for settlement purposes.

Each Scheduling Coordinator shall submit Settlement Quality Meter Data in kWh or MWh values for all of the Scheduling Coordinator Metered Entities that it schedules aggregated by:

- (a) LAPs and PNodes, as applicable; and
- (b) the relevant PNode for Generating Units

Attachment A – Draft SQMD Plan

[Placeholder for Draft SQMD Plan]

Attachment B – Draft SQMD Resource Template

[Placeholder for Draft SQMD Resource Template]

Attachment D – Board Memoranda
Tariff Amendment to Implement Metering Rules
Enhancement Initiative
California Independent System Operator Corporation



Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President, Market and Infrastructure Development

Date: December 7, 2016

Re: **Decision on metering rules enhancements proposal**

This memorandum requires Board action.

EXECUTIVE SUMMARY

Management's metering rules enhancements proposal will provide additional metering flexibility to market participants and reduce costs to participate in ISO markets while maintaining meter data integrity and quality. The proposal expands eligibility for an existing less onerous metering option ("scheduling coordinator metered entity") to certain market resources that otherwise must be ISO metered entities today, such as participating generators. This expanded optionality will enable additional market participants to forego certain costs associated with ISO metered entity status. To ensure that scheduling coordinators provide settlement quality meter data for these new scheduling coordinator metered entity resources, they would be required to submit for ISO review and approval a settlement quality meter data plan that describes in detail the metering configurations for the resources they represent. Management's proposal also provides that existing metered entities, regardless of type, will have the option to retain current metering requirements and maintain their status quo. The proposal will benefit many resources, including existing and future resources in the ISO balancing authority area and generators in external balancing areas that participate in the energy imbalance market.

Management recommends the following motion:

Moved, that the ISO Board of Governors approves the proposal for metering rules enhancements, as described in the memorandum dated December 7, 2016; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

DISCUSSION AND ANALYSIS

ISO market settlement requires settlement quality meter data for resources participating in its markets. Settlement quality meter data is obtained from two different market participant sources: ISO metered entities (ISOME) and scheduling coordinator metered entities (SCME). For ISO metered entities, meters are directly polled by the ISO and the ISO performs the validation, estimation and editing procedures to produce settlement quality meter data. For scheduling coordinator metered entities, the scheduling coordinator polls the meters of the resources they represent, performs the validation, estimation and editing procedures, and submits the resulting settlement quality meter data to the ISO.

Through prior stakeholder initiatives on specific efforts such as demand response, the energy imbalance market, and distributed energy resource aggregation, Management revised the ISO's metering requirements to support these efforts and provide additional flexibility to market participants. One outcome of these successful efforts is that they led to expanded use of scheduling coordinator metered entities. Management launched the metering rules enhancements initiative in 2016 to provide additional metering flexibility to further reduce costs to participate in ISO markets while maintaining the accuracy and integrity of meter data used for market settlements. Building on prior initiatives, Management's metering rules enhancements proposal will further expand use of scheduling coordinator metered entities as well as make other enhancements.

First, Management's proposal provides new scheduling coordinator metered entity optionality to certain market resources that otherwise must be ISO metered entities today. This new optionality is provided to the following market resource types: generation providing ancillary services, generation in the ISO balancing authority area providing energy only (i.e., not providing ancillary services), intraties, and distributed energy resources under a participating generator agreement. Expanded scheduling coordinator metered entity optionality will enable additional market participants to forego certain costs associated with ISO metered entity status. These include foregoing use of an ISO approved meter, meter reprogramming, meter inspection by an ISO authorized inspector, and telecommunication costs.

Second, scheduling coordinators will be required to develop and submit a settlement quality meter data plan for all new scheduling coordinator metered entities they represent. The plan provides the means to ensure that the quality and integrity of meter data used in settlements is maintained. Management's proposal applies to all new scheduling coordinator metered entities, regardless of whether the particular market resource type could be a scheduling coordinator metered entity prior to the proposal. The meter data plan requirement also would apply to new resources in the ISO balancing authority area that were previously EIM participating generators not subject to the plan requirement. The plan requirement does not apply to ISO metered entities, whether existing or new.

Third, in addition to expanded scheduling coordinator optionality, Management's proposal makes enhancements to certain meter data interval requirements. Under the proposal, new generators providing energy only, whether in the ISO balancing authority area or EIM participating generators, must submit settlement quality meter data in intervals of 5 or 15 minutes (today those in the ISO balancing authority area may submit in intervals of 5, 15, or 60 minutes and EIM participating generators must submit in intervals of 5 minutes). This enhancement requires that new energy-only generators in the ISO balancing authority area submit meter data on a more granular level and treats new participating generators in EIM similarly by allowing them to also submit in intervals of 5 or 15 minutes. The ISO will then divide and average larger intervals into 5-minute intervals. For EIM participating generators, this represents a potential cost savings by avoiding the need to reprogram existing meters already capable of submitting meter data in 15-minute intervals.

Importantly, existing metered entities, regardless of whether they are ISO metered entities or scheduling coordinator metered entities, will have the option to retain their current metering requirements and maintain their status quo. Management's proposal does not impose any additional requirements (including the meter data plan) for existing participants who wish to remain at their current metering standing, but gives them the flexibility to change if they so choose. These existing metered entities would not be subject to the requirement to submit a meter data plan.

POSITIONS OF THE PARTIES

Stakeholders broadly support Management's proposed metering rules enhancements. Management received final written comments from PacifiCorp, Pacific Gas and Electric, and Southern California Edison expressing full support for the proposal. The proposal was presented to the EIM Governing Body at their November 30 meeting where the EIM Governing Body determined that it would exercise its advisory role, and will support the initiative.

CONCLUSION

Management recommends that the Board approve its proposed metering rules enhancements. Management's proposal will provide additional metering flexibility to market participants and reduce costs to participate in the ISO market.

Attachment E – List of Key Dates in Stakeholder Process

Tariff Amendment to Implement Metering Rules

Enhancement Initiative

California Independent System Operator Corporation

List of Key Dates in the Stakeholder Process for this Tariff Amendment¹

Date	Event
February 24, 2016	CAISO publishes issue paper and straw proposal
March 3, 2016	CAISO hosts stakeholder conference call and web conference on issue paper and straw proposal
March 21, 2016	Stakeholders submit comments on issue paper and straw proposal
April 19, 2016	CAISO publishes revised straw proposal
April 26, 2016	CAISO hosts stakeholder conference call and web conference on revised straw proposal
May 17, 2016	Stakeholders submit comments on revised straw proposal
June 7, 2016	CAISO publishes draft final proposal
June 14, 2016	CAISO hosts stakeholder conference call and web conference on draft final proposal
June 16, 2016	CAISO publishes supplement to draft final proposal
June 30, 2016	Stakeholders submit comments on draft final proposal
September 1, 2016	CAISO publishes second supplement on draft final proposal
September 12, 2016	CAISO hosts stakeholder conference call and web conference on second supplement on draft final proposal
September 20, 2016	Stakeholders submit comments on second supplement
November 1, 2016	CAISO publishes revised draft final proposal
November 10, 2016	CAISO hosts stakeholder conference call and web conference on revised draft final proposal
November 21, 2016	Stakeholders submit comments on revised draft final proposal
December 5, 2016	CAISO publishes draft tariff language
December 19, 2016	CAISO hosts stakeholder conference call and web conference on draft tariff language
January 13, 2017	CAISO publishes revised draft tariff language
January 24, 2017	Stakeholders submit comments on revised draft tariff language

¹ See <http://www.aiso.com/informed/Pages/StakeholderProcesses/MeteringRulesEnhancements.aspx> for links to all documents.