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Attachment 4
Proposals for Working Group 1
Topic 1.4 Demonstrated Capacity Invoicing

Attachment B

All Proposals for Subtopic 1.4

SOUTHERN CALIFORNIA EDISON (SCE)

1.4 (SUB-TOPIC #4) Demonstrated Capacity Invoicing
1.4.1 Dispatch Results on Invoices
1.4.2 Must-Offer Obligation Based Invoices

SCE proposal: 1.4 Demonstrated Capacity Invoicing

The DRAM Resources are relied on for reliability, and as such the LSE and CAISO must have confidence in the load reduction capabilities of PDRs/RDRRs of the DRAM Resources. The current DRAM Contract gives the Sellers flexibility, in a month when a PDR or RDRR in the DRAM Resource has not been fully dispatched or tested, of invoicing Demonstrated Capacity based on the Must-Offer Obligation (MOO) option (i.e. how many MW was bid into the CAISO market during the CAISO Availability Assessment Hours), and not actual measurements of load drop. Because sellers may have different views and practices in determining their available MW and prices when fulfilling their MOO, using the MOO as a basis for invoicing can create incentives for sellers to take as aggressive an approach as possible (and, possibly, to price their wholesale market bids in a way that would minimize the chances of ever being called to perform). It is SCE's understanding, based on the Energy Division's Evaluation Of Demand Response Auction Mechanism - Final Report, dated January 4, 2019 (ref. Section 8.2.3 and 8.3), that DRAM PDR/RDRR resources has a low rate of awards in the CAISO market, likely due to high market bids by the Sellers.

Proposal Part A

SCE proposes to require invoicing based on dispatch or test results when available, and require testing more frequently than in the DRAM Contract to gain more transparency in actual load-drop capabilities of DRAM PDR/RDRRs. SCE proposes that testing be required at least every second month.

The current DRAM Contract requires a test each August for each PDR/RDRR if there was no Full Dispatch during the month of August. Additionally, if the delivery term is longer than 6 months, the DRAM Contract requires a test in the first half of the delivery period for each PDR/RDRR that does not have a Full Dispatch. SCE proposes that the MOO option to determine Demonstrated Capacity be unavailable to Sellers in the month following a month in which the Demonstrated Capacity was determined by testing or dispatch to be less than the MW shown on the RA supply plan for the DRAM Resource. (For clarity: the dispatch and testing options would still be available during that month.)

SCE expects that increasing the frequency of testing required by the DRAM Contract will provide better transparency into the actual load reduction capability of the DRAM resources and thereby help to assure the capacity is available and reliable. This improvement to the DRAM pro forma will also address some aspects of the concerns addressed in Working Group item 1.2 (Dispatch Hours), in that it indirectly

incentives the DRAM Sellers to seek more dispatches. Further, SCE expects it may also incentivize DRAM Sellers to offer their DRAM Resources at more competitive prices to the CAISO market in order to try to capture CAISO market revenues on days when the DRAM Sellers anticipate their largest load reduction potential can be achieved.

Proposal Part B

Further, SCE proposes to mitigate concerns with service account shuffling between PDR/RDRR registrations intra-month, which can lead to the same service account load drop potentially being counted multiple times in the determination of Demonstrated Capacity. SCE proposes that the DRAM Contract should be updated to restrict Seller from moving customer service accounts between PDRs/RDRRs within a month as follows:

A) Seller can add a new recruited service account to a PDR/RDRR of the DRAM Resource only if that service account is not part of a PDR/RDRR that is already providing RA for the same month to Buyer or any other LSE.

B) If a service account has moved to a new LSE (e.g. CCA or SCE), then Seller can move (add/remove) that service account between PDRs/RDRRs of the DRAM Resource only if the CAISO tariff requires PDR/RDRRs to consist of service accounts that are customers of the same LSE (note: CAISO's ESDER 3 proposed tariff update may eliminate this constraint before 2020)

JOINT DR PARTIES

Working Group 1.4 –Demonstrated Capacity

Problem Statement: There were two problems associated with this issue: 1. How do IOUs/ratepayers know if resources really exist if MOO used? and 2. Resource shuffling may mean customers are moved around to make it look like each resource is valid when it is not.

Proposal: If there is no legitimate reason for a resource to be dispatched in a given month, MOO should be used. If a dispatch of the full capacity of a resource or two-hour test of a full resource occurs in any month, Demonstrated Capacity for the test or dispatch should be used. A full test/dispatch requirement in first 6 months of a year-long contract, and test/dispatch in August of all contracts should be retained. To avoid resource shuffling issues – only allow customers to move between a particular DRPs resource during a month if there is an LSE change, or some other legitimate reason that the DRP can justify with the IOU – all other changes could be done in between months. In August and in the first 6 months of the contract, a test or dispatch should be performed. If a test is used instead of a dispatch, the DRP should be required to dispatch all untested resources the same day. Resources dispatched in the month would not need to be tested.

Discussion:

- Absent monthly testing requirements – which is a non-starter for customers – the MOO as an invoicing option must be preserved.
- JDRP expect that some ex ante plausibility look will be put in place as discussed in WG 1.1, this still allows MOO to provide resource assurance when coupled with use of test/dispatch seasonally as in the current contracts.
- All entrants – new and existing can use.

OHMCONNECT

ohmconnect

Working Group 1.4 (Sub-Topic: Demonstrated Capacity Invoicing)
Proposal: Ex Post Demonstrated Capacity Using Single Customer Performance

A. Problem Statement

Stakeholders have expressed concern in workshops and written comments that the current monthly invoice process creates scenarios whereby Demonstrated Capacity (either the result of a Resource dispatch or test) may either not count, or double-count, certain customers. Generally, this behavior occurs because CAISO processes are designed for DRPs to adjust Resource composition throughout the month (via Resource Registrations) in order to accurately reflect the underlying customers (i.e. Locations) to the CAISO market. There are many reasons that Resource composition could change during the month, including:

- Location has a change in LSE;
- Location enrolls in the DRP program mid-month;
- Location disenrolls from the DRP program mid-month; or,
- DRP re-balances Location allocation.

The examples above would necessitate Resource enrollment changes during the month. Appendix A provides an example of this phenomenon.

While these changes can be reflected and tracked through the CAISO DRRS Resource Registration process, the end-of-month DRAM invoices do not have a way to show, or account for, these changes. Therefore, DRPs that submit invoices containing a showing of performance for the Demonstrated Capacity requirement – due to a "Full Dispatch" or Resource Test in the month – may submit Demonstrated Capacity that does not count every enrolled customer once (and only once).

In sum, there are two key circumstances that cause an enrolled Location to not be counted once, and only once, when the DRP submits its invoice at the end of the month:

- A Location may move to a different Resource over the course of the month.
- A Location may not be "Active" for the entirety of the month.

The proposal herein is designed to ensure that each customer that was registered in a Resource *and* tested/dispatched by CAISO during a given month is counted once, and only once, for purposes of invoicing.

B. Description of Methodology

OhmConnect proposes invoicing portfolio performance, by SLAP, based on the weighted performance during a CAISO test/dispatch of each Location (i.e. user) that was in a Resource Registration during the month, where the weighting is based on the number of days the Location was "Active" in DRRS. The general steps are as follows:

1. Calculate individual weighted performance for each Location

2. Sum the individual weighted performance (from (1)) by SLAP
3. Assign the summed SLAP performance (from (2)) proportionally to each Resource in that SLAP that was assigned to supply RA MW for the invoiced month (via the monthly Supply Plan).

Calculate individual weighted performance

First, the DRP will need to calculate at a Location-level two pieces of information:

1. The assigned weighting
2. The Location's performance

To determine the Location's assigned weighting, the DRP should identify the number of days in the month for which the Location was enrolled in DRRS (specifically, for which the Location status was equal to "Active") and registered in a Resource that is listed on that month's Supply Plan. This number should be divided by the total number of days in the month to provide the *assigned weighting* (i.e. the percentage of days that the Location was Active in DRRS).

To determine the Location's performance, the DRP should utilize the same CAISO baseline methodologies that are used for settling Energy transactions at the Resource-level, and apply them at the Location level. The DRP will identify all hours where the Location was registered (i.e. Active) in a Resource *and* the Resource received a CAISO test or dispatch (e.g. Total Expected Energy (TEE) greater than 0). For all of these instances, the DRP should then calculate performance based on the Location's load (from the meter data provided by its IOU serving as its MDMA), during each positive TEE hourly interval. The DRP should then identify the hourly interval where the Location demonstrated the best performance, which will be treated as the *Location's performance*.

The *individual weighted performance* for each Location is simply the product of the assigned weighting and the Location's performance for that month.

Aggregate individual weighted performance by SLAP

Second, once the DRP has calculated individual weighted performance for each Location that was Active during the month, the DRP should sum all individual weighted performance, by SLAP, to calculate total performance at the SLAP level.

Proportionally allocate performance to Resources

Third, the DRP should consult its previously-submitted Supply Plan for the month for which it is invoicing. The Supply Plan will indicate the MW allocation by Resource (i.e. the "Supply Plan Capacity"). The DRP should then assign the summed SLAP-level performance proportional to the Supply Plan Capacity allocation by Resource, as dictated on the Supply Plan. This can be done using the following steps:

1. Using the corresponding monthly Supply Plan, the DRP identifies, across all contracts, each Resource and the Supply Plan Capacity that the Resource is to provide for the month.

- The DRP should also identify, for each Resource, the associated SLAP. The SLAP is fixed to the Resource and will not change.

2. The DRP should sum, by SLAP, the total Supply Plan Capacity across all contracts for the month. This is the Total SLAP Supply Plan Capacity.
3. For each Resource in the SLAP, the DRP should divide the Resource Supply Plan Capacity by the Total SLAP Supply Plan Capacity. This value informs the proportion of Supply Plan Capacity that is provided by that specific Resource, on a SLAP level.
4. This proportion calculated in (3) should be multiplied by the total SLAP-level performance. The product of these two provides the proportional Resource-level performance, which can then be used to Demonstrate Capacity on the monthly invoice.

Appendix B uses the scenarios from Appendix A to illustrate how to apply this methodology.

C. Discussion

This proposal ensures that each contributing customer is counted once and only once for monthly invoicing while aligning the need to invoice at a Resource-level (due to the Supply Plan) with the Location-level movement between Resources. Weightings (both in calculating Locational performance and allocation of total SLAP performance across Resources) were utilized to prevent disproportionate counting of customers. Furthermore, Locational performance is intentionally calculated using existing CAISO baseline methodologies, which were vetted at length through a stakeholder process and are used to calculate performance and settle at the Resource-level in the CAISO market.

Functionally, a DRP could presently adopt this proposed methodology if all of its Locations are capable of a load drop of at least 100 kW.[1] In this event, the Location could act as a Resource by itself. Therefore, this proposal seeks to extend the solution available to *some* Locations to *all* Locations. However, this proposal is not intended to serve as a one-size-fits-all proposal; a DRP may not want to use this proposal, or may find this proposal unnecessary if its underlying customers are large enough that they can functionally already act as their own Resources.

D. Pros/Cons

Operational efficacy: Stakeholders have expressed concern, specifically, about the miscounting of customers for invoicing purposes, and more generally about the need for greater visibility into the Resources and/or underlying Locations to provide certainty that the contracted capacity exists. This proposal provides that certainty by providing granular, Location-level performance proportionally aggregated to a Resource-level. Operationally, the proposal reduces the invoicing complexities that occur when Locations move between Resources while maintaining the monthly, Resource-level invoicing frequency. In addition, this proposal **does not** impact the functionality of the Resource in the CAISO market (the Resource will still be comprised of Locations, bid into the CAISO market, and provide Resource Adequacy). Finally, this proposal *may* remove a step in any auditing of the DRP invoices.

[1] CAISO Tariff, Paragraph 4.13.5.2.1

Verifiability: This methodology would utilize existing meter data that is already sent from the IOU to the DRP for each authorizing customer (and all Active customers in DRRS must authorize the DRP access to their meter data as a condition of enrolling).

Costs: Added cost would be relatively minimal. The data used to calculate the Demonstrated Capacity should already be available to the DRP, and to the IOU in an event of an audit.

Impacts on new entrants: There is not likely to be a sizeable impact on new entrants. New entrants, just like existing entrants, will be able to utilize this methodology once a Resource undergoes a CAISO event (dispatch or test). The proposal treats new entrants and existing entrants equivalently.

Impacts on good actors: This proposal is designed to accurately reflect performance capabilities of a DRP portfolio. For good actors; this ex post methodology will accurately relay on the monthly invoice that the DRP customers are providing the capacity the DRP has contracted to provide.

Parties' positions (for and against): Parties have expressed an interest in eliminating the double-counting, and/or non-counting, of customers that contribute to a DRP's Registered Resources in CAISO. This proposal is intended to address such party concerns.

E. Dependencies

This proposal is not directly dependent on any other sub-topic issue. This proposal is also not intended to serve as the *only* methodology to demonstrate capacity ex post. However, in the event that the Commission determines that DRAM Sellers should invoice using Demonstrated Capacity, and that the invoicing continues to reflect the monthly Supply Plan (including assigning Supply Plan Capacity by Resource), this proposal could serve as *one* option that Sellers may use to invoice.

Appendix A: Demonstrated Capacity Example

Consider the following simple example, with three Locations (Anthony, Barbara, and Charles) and two Resources (Resource 1 and Resource 2). Each Resource belongs to a separate LSE, but both Resources and all underlying Locations belong to the same SLAP.

The following enrollment changes occur for the three Locations during the month:

- Anthony begins the month enrolled in the LSE "Clean Energy". However, on the 14th he disenrolls from "Clean Energy" and enrolls in the "Green Energy" LSE. Because his LSE has changed, Anthony's Location must now move to the Resource corresponding to that LSE. This movement is done on the 16th.
- Barbara begins the month enrolled in the DRP's program. However, on the 22nd she leaves the program permanently.
- Charles enrolls in the DRP's program beginning on the 13th.

These enrollment changes are illustrated below in Figure 1:

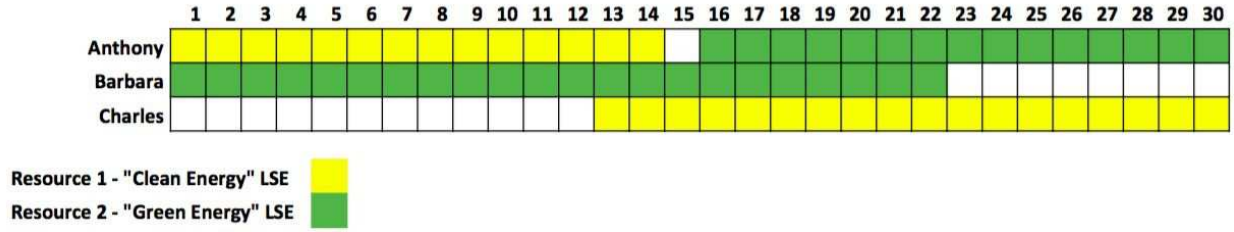

Figure 1: Example monthly resource enrollment

Continuing the example, each Resource has two events (i.e. dispatch or test) during the month:

- Resource 1 has an event on the 11th (Anthony) and the 24th (Charles).
- Resource 2 has an event on the 9th (Barbara) and the 19th (Anthony and Barbara).

The occurrence of the events is shown in Figure 2:

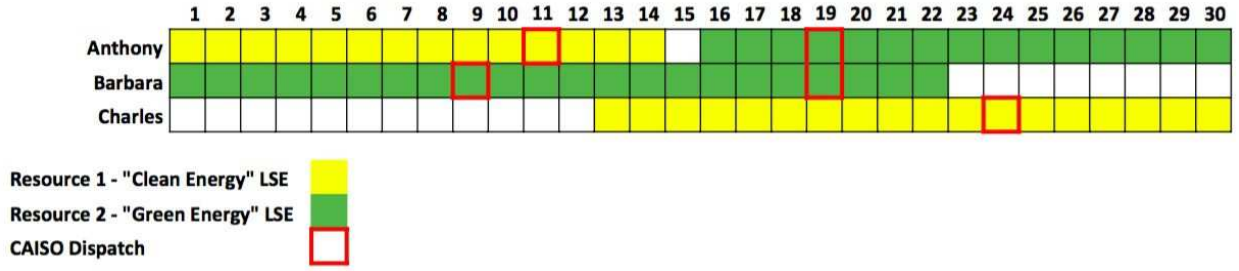

Figure 2: Example monthly resource enrollment with events

Scenario 1:

Under Scenario 1, suppose that the individual performance of each Location was as follows, in Figure 3:

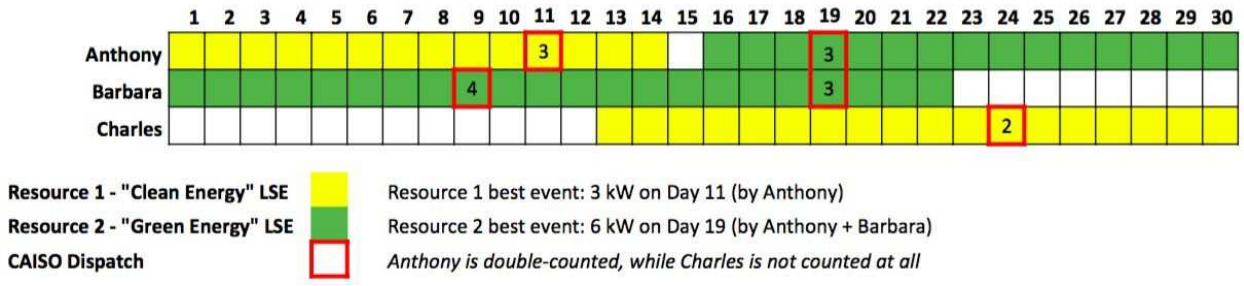

Figure 3: Example monthly resource enrollment with events and performance

Under the existing Demonstrated Capacity process, the DRP would invoice based on the best performance of each Resource during the month.[2] In Scenario 1, the following four events occurred:

- Resource 2, Day 9: 4 kW
- Resource 1, Day 11: 3 kW
- Resource 2, Day 19: 6 kW
- Resource 1, Day 24: 2 kW

The DRP would invoice the performance from Resource 1 on the 11th, and Resource 2 on the 19th. Doing so would imply a total portfolio performance of 9 kW. However, Anthony would be counted "twice", and Charles would not be counted at all.

Scenario 2:

Alternatively, the example could be adjusted to illustrate outcomes based on slightly different Location performance while keeping the date of the events the same (Figure 4):

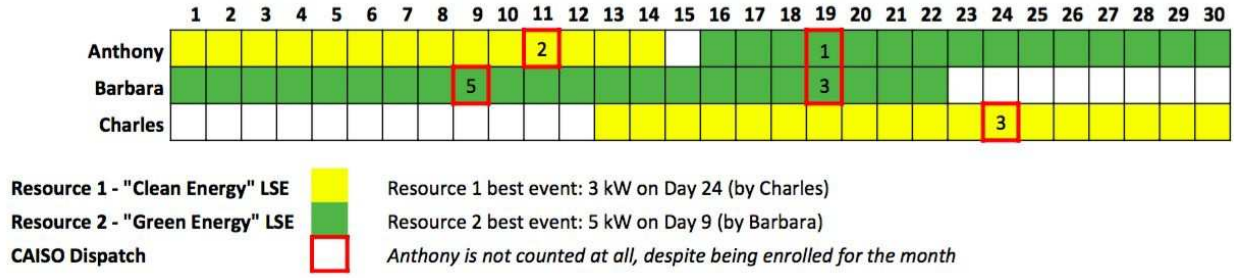

Figure 4: Example monthly resource enrollment with events and alternate performance

In Scenario 2, the following four events would occur:

- Resource 2, Day 9: 5 kW
- Resource 1, Day 11: 2 kW
- Resource 2, Day 19: 4 kW
- Resource 1, Day 24: 3 kW

[2] See DRAM Pro Forma, Section 1.6(a)(i).

The DRP would now invoice the performance from Resource 1 on the 24th, and Resource 2 on the 9th. Doing so would imply a total portfolio performance of 8 kW. However, Anthony would not be counted at all (despite being dispatched twice, being able to provide up to 2 kW, and being enrolled in the program for virtually the entire month).

Appendix B: Demonstrated Capacity Example

Appendix A illustrated two scenarios where two Resources each had two events over the course of a month. Three Locations comprised these two Resources. Continuing this example from Appendix A, each scenario can be used to demonstrate how a DRP could use these events to invoice Demonstrated Capacity.

For both scenarios in Appendix A, each Location's assigned weighting remains the same (because each scenario maintained the same Location enrollment:

- Anthony: 96.7% (29 Active days / 30 total days)
- Barbara: 73.3% (22 Active days / 30 total days)
- Anthony: 60.0% (18 Active days / 30 total days)

Under Scenario 1, the corresponding Location's performance would be the following:

- Anthony: 2.90 kW (3 kW on the 11th x 96.7%)
- Barbara: 2.93 kW (4 kW on the 9th x 73.3%)
- Charles: 1.20 kW (2 kW on the 24th x 60.0%)

And under Scenario 2, the corresponding Location's performance would be the following:

- Anthony: 1.93 kW (2 kW on the 11th x 96.7%)
- Barbara: 3.67 kW (5 kW on the 9th x 73.3%)
- Charles: 1.80 kW (3 kW on the 24th x 60.0%)

With these three Locations, the DRP could then invoice for a total performance of 7.03 kW under Scenario 1 and 7.40 kW under Scenario 2. However, because the Locations belong to multiple Resources under the same SLAP, the DRP must proportionally allocate the total performance across Resources, because invoicing is done at the Resource level.

Suppose that for both Scenarios, the Supply Plan Capacity for Resource 1 was 3 kW and the Supply Plan Capacity for Resource 2 was 4 kW; both Resources are assigned to the same SLAP. After identifying the Supply Plan Capacity for each Resource in the SLAP (in this example, it is only these two Resources that are assigned to the SLAP), the DRP would find the Total SLAP Supply Plan Capacity by summing the Supply Plan Capacity for each Resource. For this SLAP, the Total SLAP Supply Plan Capacity is 7 kW (3 kW + 4 kW). The proportion of Supply Plan Capacity that each Resource is responsible for is found by taking the Supply Plan Capacity of the Resource and dividing it by the Total SLAP Supply Plan Capacity:

- Resource 1: 42.9% (3 kW / 7 kW)
- Resource 2: 57.1% (4 kW / 7 kW)

These calculated proportions are then multiplied by the SLAP-level performance to find the proportional Resource-level performance. Under Scenario 1, the Resource-level performance would be the following:

- Resource 1: 3.01 kW (42.9% x 7.03 kW)
- Resource 2: 4.02 kW (57.1% x 7.03 kW)

This Resource-level performance could then be used to Demonstrate Capacity on the monthly invoice.

Under Scenario 2, the Resource-level performance would be the following:

- Resource 1: 3.17 kW (42.9% x 7.40 kW)
- Resource 2: 4.23 kW (57.1% x 7.40 kW)

OLIVINE

Demonstrated Capacity (1.4)

Olivine Proposal

Our proposal is:

- Only allow MOO in the absence of Require test/dispatch to be used for DC.
- Generally, require coincident test / dispatch for all resources across the utilities contracts within a Sub-LAP.
- Allow exceptions to the coincident rule in the case that customers have not been moved between registrations within the delivery month.
- Maintain the status quo that energy delivery by CAISO performance standards is the only allowed computation for test / dispatch demonstrated capacity.

The proposal is intended to ensure that customers are not double-counted, and that the RA capacity that has been provided to the CAISO is comparable to actual energy delivery in the case of dispatch.

This proposal makes explicit an assumption made within the existing DRAM – that customers do not switch between resources – and ensures a level playing field for new entrants and experienced contract holders.

STEM, INC.

DRAM Working Group 1, Subtopic 1.4 – Demonstrated Capacity

Proposal: Use CISO Certified DRP Provided Load Meters to Allow 5-Minute Settlements

Proposed by: Stem, Inc.

Contact: Jim Baak
Jim.baak@stem.com
(925) 788-3411

Problem Statement:

Currently, CAISO dispatches resources in 5-minute intervals in the real-time market. However, the IOUs settle based on their customer load meters, which are 15-minute interval meters. This results in DRPs receiving less than the full value for the capacity that was actually dispatched as called for, or unnecessary dispatched by the DRP's resources to receive the value of the interval dispatched.

The following examples demonstrate the problem of being dispatched for 5-minute intervals while being settled at 15-minute intervals:

Example 1: The system discharges 100% of the requested value for one 5-minute interval, but when settled at the 15-minute interval the average performance will be 1/3 of actual performance.

- For example, say the requested kW discharge for one 5-minute interval was 200kW. If the system acted perfectly, the system would deliver 200 kW in one 5-minute interval, then zero kW in the second two intervals. The average kW across the 15-minute interval for settlement purposes would be 200 kW/3, or 66 kW.

Example 2: The system could discharge 100% of the requested value during the requested two 5 minute intervals, but when settled at the 15-minute interval the average performance will be 2/3 of actual performance.

- For example, say the requested kW discharge for two 5-minute intervals was 200kW in each interval, if the system acted perfectly, the system would deliver 200 kW in both 5-minute intervals, then zero kW in the remaining interval. The average kW across the 15-minute settlement interval would be 400 kW/3, or 133 kW.

When dispatched for a 5-minute interval but settled at a 15-minute interval, currently the only way to achieve full settlement for one or two 5-minute dispatched intervals is to dispatch the requested kW across the entire 15-minute interval. This does not meet the intent of 5-minute dispatches and does not settle DRPs for their true performance at their dispatched interval(s).

Proposed Solution:

Allow DRPs to use SGIP Performance Based Incentive load meters installed by the DRP on the load for settlement purposes. The advantage of using SGIP load meters is that they are already installed on all SGIP PBI loads, many of which participate in DRAM already. The IOUs already use these meters to determine SGIP performance. CAISO would need to accept data from these meters, however.

Alternatively, the DRPs should be allowed to use CAISO certified load meters for settlement purposes. Since these meters have already been certified by CAISO, the IOUs should accept load data for DRAM settlement purposes.

The main disadvantages of relying solely on the CAISO certified meters is that their list of approved meters is smaller than the allowable meters for the SGIP PBI program. Allowing the use of either SGIP PBI approved meters or CAISO certified 5-minute load meters provides the greatest flexibility while minimizing costs for DRPs and customers. It would require the IOUs and CAISO to modify their list of approved meters for DRAM settlement purposes, but without requiring significant additional meter costs in many cases.