Flexible Resource Adequacy Criteria and Must-Offer Obligation
Fifth Revised Straw Proposal Stakeholder Comments

Company	Date	Submitted By
Bay Area Municipal Transmission Group	1/31/2014	Doug Boccignone dougbocc@flynnrci.com 888-634-7509

Flexible Capacity Allocation

BAMx supports calculating the intermittent generation and load components based on the contribution of each component to the monthly top five 3-hour net-load change as described in the 5th Revised Straw Proposal.[1]

BAMx also supports determining each LRA's contribution to flexible capacity need using historic load data, and forecast intermittent generation data based on the specific RPS portfolios submitted to the CAISO by jurisdictional LSEs of each LRA.[2]

ISO Response

The ISO appreciates the support for this aspect of the proposal.

Flexible Capacity Showings

BAMx supports the use of separate RA showings for flexible capacity and system and local capacity. That is, a resource can be shown as flexible and not count towards meeting a generic RA requirement, and would be subject only to the applicable flexible capacity offer requirement. For those flexible capacity resources that are also shown as meeting local and/or system RA, the resource would need to meet both sets of offer requirements.[3]

[1] FRACMOO Fifth Revised Straw Proposal, p. 18.
[2] FRACMOO Fifth Revised Straw Proposal, p. 10.
[3] FRACMOO Fifth Revised Straw Proposal, p. 31.

ISO Response
The ISO appreciates the support for this aspect of the proposal.
Flexible Capacity Categories
BAMx supports the four technology neutral flexible capacity categories described in the 5th Revised Straw Proposal,[4] but the CAISO should clarify in the draft final proposal that a single flexible capacity resource may provide flexible capacity in one or more categories, with the corresponding Must Offer Obligation for each category. Given that we are not aware of any resource with unlimited flexibility, we suggest renaming Category 1 to Greatest Flexibility. BAMx disagrees that Use-Limited resources should be excluded from Category 1. Some Use-Limited resources may well be able to provide the flexibility sought for Category 1 for at least a portion of their Effective Flexible Capacity. For example, a hydro resource that may only be able to provide 6 hours of energy at its EFC may be able to provide 17 hours of energy for a portion of its EFC. BAMx also believes that the CAISO should not need to rely on resources with unlimited starts to meet the Category 1 needs. A more reasonable Category 1 requirement would be at least two starts per day. Many flexible resources could be operated at levels below PMax and still provide flexibility without having to be cycled on and off. BAMx suggests a slightly modified approach for describing the qualification requirements for each flexible capacity category: For all flexible capacity resources, the resource characteristics specified in the Master File (e.g., ramp rates, Pmin, minimum run-time, etc.) apply. To qualify for a particular category, the flexible capacity resource must be able to meet the following requirements: Category 1 (Greatest Flexiblity) • Must have the ability to start at least twice each day

[4] FRACMOO Fifth Revised Straw Proposal, p. 24.

- Must be capable of providing energy up to the Category 1 quantity shown for the remaining dispatch hours (up to 17 hours maximum per day)

Category 2 (Limited Flexiblity)

- Must have the ability to start at least twice each day
- Must be capable of providing energy up to the Category 2 quantity shown for the lesser of the remaining dispatch hours (up to 17 hours maximum per day) or six hours per day (for Use-Limited Resources)

Category 3 (Peak Flexiblity)

- Must have the ability to start at least once each day
- Must be capable of providing energy up to the Category 3 quantity shown for the lesser of the remaining seasonally-determined dispatch hours (up to 5 hours maximum per day) or three hours per day (for Use-Limited Resources)

Category 4 (Super-Peak Flexiblity)

Option 1 – Energy Resources

- Must have the ability to start at least once each day
- Must be able to respond to at least 5 market dispatches per month
- Must be capable of providing energy up to the Category 4 quantity shown for the lesser of the remaining seasonally-determined dispatch hours (up to 5 hours maximum per day) or three hours per day

Option 2 – Regulation energy management resources

- Must be available to provide regulation for the Category 4 quantity shown from 5:00 am to 10:00 pm daily

ISO Response

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed “unlimited” and “limited flexibility” categories into a single category, named “base flexibility” and would allow use-limited resources

to provide base flexibility.

The ISO has combined the previous “unlimited” and “limited” categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs, which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details.

Company	Date	Submitted By
California Energy Storage Alliance	1/31/2014	Don Liddell,Douglass & Liddell liddell@energyattorney.com (619)993-9096

Opening Comments

CESA continues to applaud the CAISO's collaborative work with the California Public Utilities Commission ("CPUC") and stakeholders reflected in the Fifth Revised Straw Proposal ("Proposal") to ensure that flexible capacity energy storage resources are available in the very near future to reliably operate the grid while fulfilling state energy and environmental goals. CESA will continue to work closely with the CAISO and the CPUC in developing the CAISO tariff changes necessary for the CAISO to adopt flexible resource adequacy ("RA") capacity requirements that specifically include energy storage for regulation, load following, and ramping needs.

ISO Response

No response required.

Energy Storage for Regulation Should be Included in Category 1

The Proposal provides that the effective flexible capacity for energy storage resources electing Regulation Energy Management ("REM") would be set at the lesser of a resource's 15-minute output capability or the resource's Net Qualifying Capacity ("NQC") to maintain consistency with the bundling principle. Under the CAISO's current market rules, a 15-minute bi-directional energy storage resource can provide REM continuously for the entire Must Offer Obligation window from 5:00 pm to 10:00 pm. Such a resource could not only provide regulation over the entire duration, but it also contributes directly to the 3-hour maximum ramp, as is shown below in Figures 1 and 2.

Figure 1: Regulation as Component of Flexibility

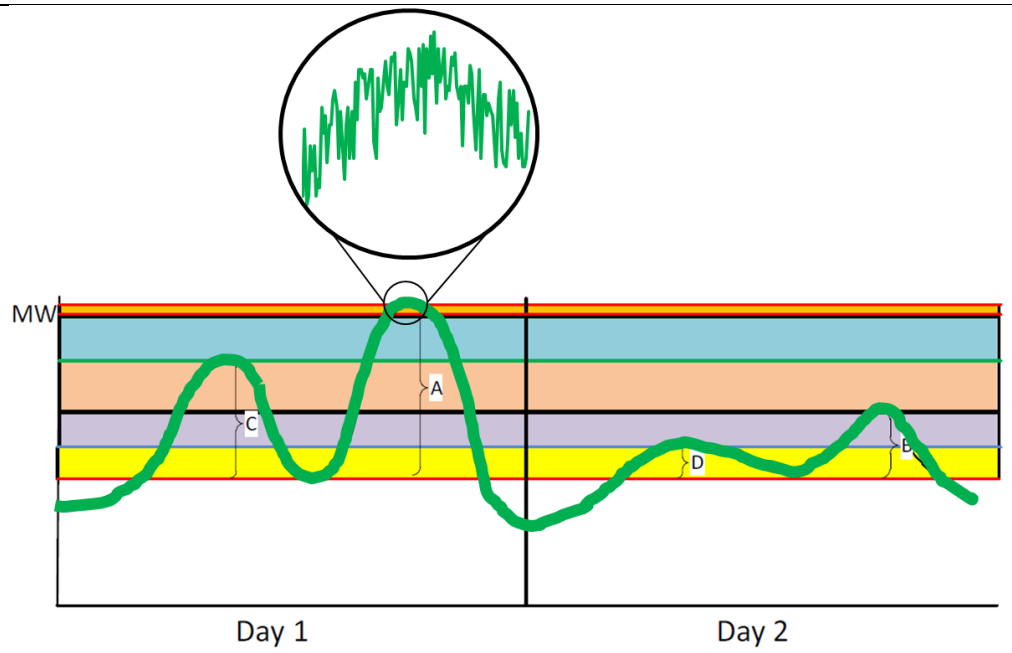
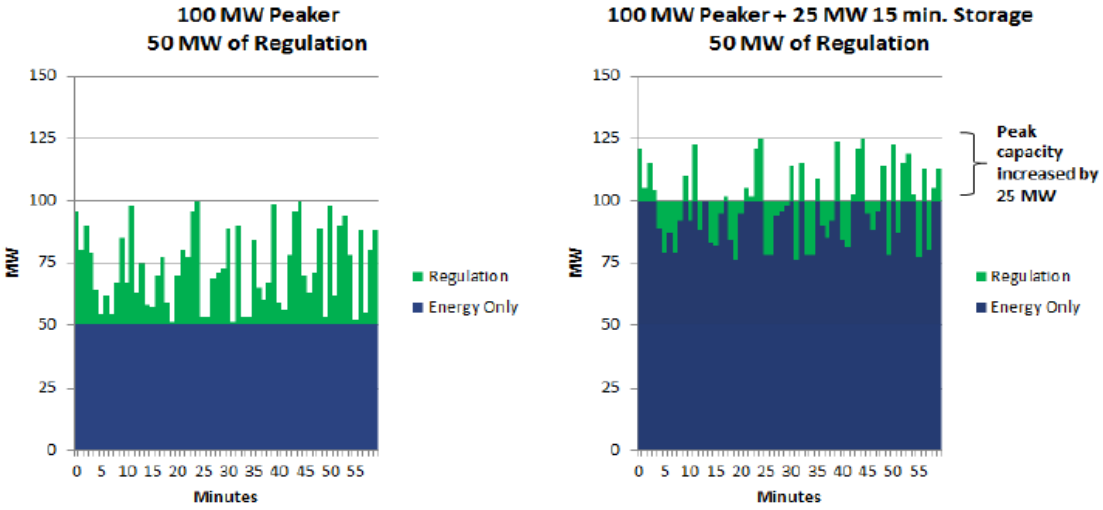


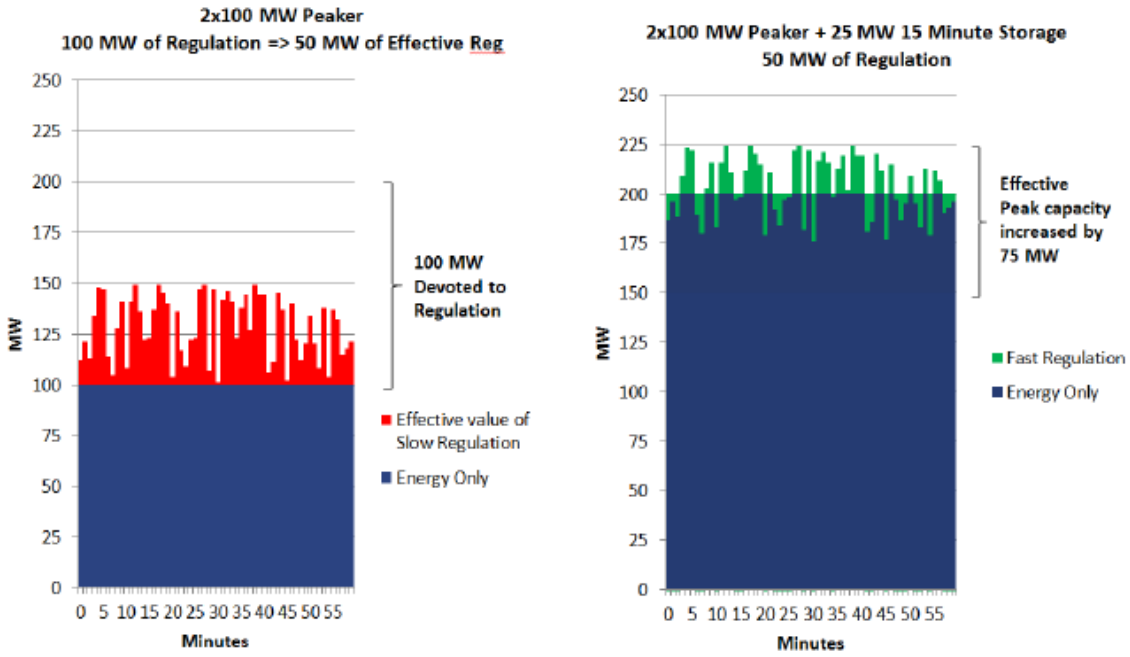
Figure 2:100 MW Peaker vs. 100 MW Peaker + 25 MW 15-Minute Energy Storage



As is shown above in Figure 2, the REM resource demonstrably contributes to peak capacity at its full 15-minute rating.

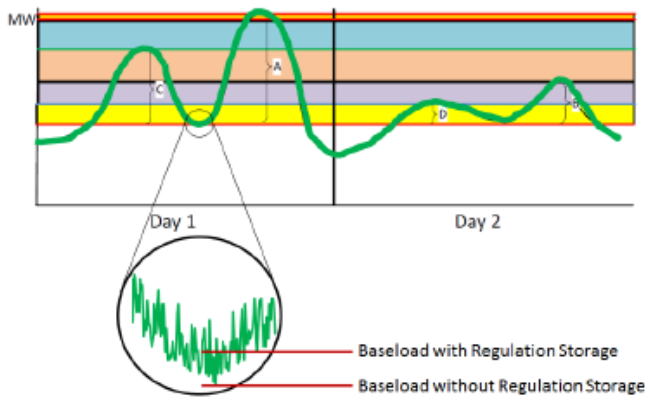
Additionally, because energy storage resources have been found to supplant the regulation capacity of at least two slower regulating generators, the EFC of a fast responding storage resource is in fact more than double its 15-minute capacity, in comparison with traditional resources. The effect of this fast response is shown below in Figure 3.

Figure 3: 2x100 MW Peaker vs. 2x100 MW Peaker + 25 MW of 15 Minute Storage



Bi-directional regulating storage resources *decrease* the need for flexibility at the low points in the net load curve shown below in Figure 4:

Figure 4: Regulation Energy Storage Reduction in Flexible Need



CESA recommends that the EFC of a 15-minute energy storage resource should be calculated according to its actual contribution to the 3-hour ramp. Effective Flexible Capacity ("EFC") should not be arbitrarily limited to the NQC, as is in effect proposed in the Proposal. CESA urges the CAISO to set the FRAC-MOO rules according to its real grid operation needs and its own market rules, rather than conform to a NQC rating system inconsistent with grid operations and a bundling principal that is unworkable in practice.

ISO Response

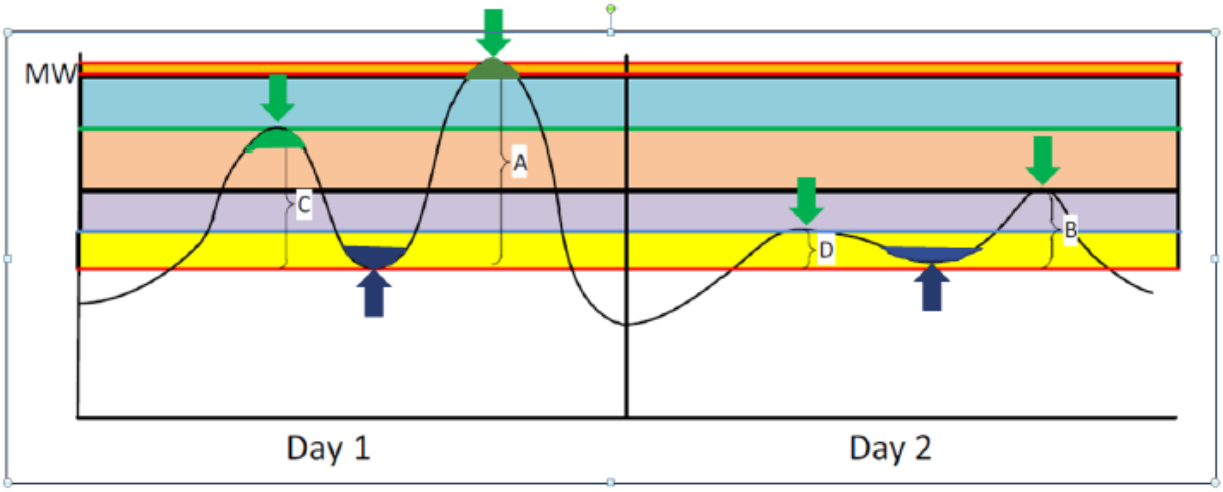
The ISO appreciates CESA's desire to include REM resources in the category 1 flexible capacity. However, the ISO believes that REM only resources appropriately belong in the super-peak category. The regulation that REM resources provide is designed to address a specific need for regulation, not load following or longer ramps. As such, the ISO believes that it is not appropriate to include a resource that is not able to address flexible capacity needs beyond the regulation. While CESA asserts that REM resources help during peaks, even CESA's figure 1 shows that the REM resource is providing regulation during the peak ramping events, not energy or ramping services. Additionally, the representation in figures 2 and 3 are not accurate. The ISO would dispatch to load and regulation up and down would be procured to fill in the fluctuations.

The charging cycle of storage may be able to provide flexibility, but the concept needs additional analysis. Further evaluation should be made of the timing of the peak and the trough of the net load, how they relate to the three-hour net load ramp, the characteristics of storage devices, and how they will be used by the ISO market optimization to reduce the net load ramp.

Longer Duration Energy Storage That Charging Should be Included in Category 1

Significant progress has been made toward the development of counting methodologies that assure comparable treatment of capabilities in the Proposal. However, many energy storage resources have the capability to charge and discharge in a highly dispatchable manner, and the counting methodology for the charging dispatch is still unclear. As shown below in Figure 5, long duration bi-directional energy storage can provide flexible benefits during charging and discharging.

Figure 5



Energy storage resources that can provide dispatchable charging during times of low net load provide a flexibility benefit to the grid, because they decrease the overall ramp. According to the structure of the Proposal, dispatchable charging is not counted as flexible capacity. Rather, the Proposal treats dispatchable charging as a reduction in the need for flexible capacity.

In order to account for the value of dispatchable charging, CESA advocates that the CAISO should allow dispatchable charging to count as a Category 1 flexibility measure. Resources that can charge dispatchably fulfill the same need as other Category 1 resources used to deal with the lowest secondary ramp. They should be counted as such. Thus, a single long duration energy storage resource might count toward two categories. For instance, it could count toward Category 2 for its discharge characteristics, and Category 1 for its charge characteristics. This approach begins to dovetail with the CPUC's proposed EFC metrics for RA, which considers bi-directional flexibility.

The CAISO could explicitly account for dispatchable charging that contributes to ramp reduction in its flexible capacity need determination. However, this approach is confusing for two reasons. The first is that the CPUC's proposed EFC metric considers dispatchable charging as part of the EFC of a resource. The second reason for confusion is that this approach separates the flexibility benefit of energy storage into two very different capabilities: need fulfillment and need reduction. Regardless of how dispatchable charging is accounted for, it is important that Load Serving Entities are able to specifically count the dispatchable charging of energy storage resources toward their flexibility obligations. Explicit counting is needed to support procurement all forms of flexible capacity.

ISO Response

The ISO has provided additional clarity on the counting provisions for storage resources that elect the full flexible capacity option. The ISO proposal treats the output of energy storage resources more consistently with conventional resources by allowing for a ramp rate rather than assuming a constant output across all hours. Additionally, it provides a clear first step for accounting for the flexible capacity benefits of energy storage resources. The ISO believes the charging portions of energy storage resources can provide flexible capacity. While the ISO's proposed methodology does not account for the charging portion, it provides a starting point that easily facilitates improvement without starting over.

Further, while the charging cycle of some storage resource may be able to provide flexibility, the concept needs additional analysis. Further evaluation should be made of the timing of the peak

and the trough of the net load, how they relate to the three-hour net load ramp, the characteristics of storage devices, and how they will be used by the ISO market optimization to reduce the net load ramp. For example, because of operational attributes, a resource might have to stop charging completely for some period of time before switching from charging to discharging. In this instance, it is not clear what flexibility benefits the energy storage resource has provided.

Technical Studies

Finally, CESA recommends that the CAISO's final draft elaborate on the specific technical studies needed to determine the optimal deployment of energy storage and meet flexibility needs identified in the 2013 Special Reliability Assessment produced jointly by the CAISO and NERC.

ISO Response

The ISO is still assessing the various technical capabilities of various storage technologies and cannot provide specific studies at this time.

Company	Date	Submitted By
California Department of Water Resources	1/31/2014	Mohan Niroula Power & Risk Office, CDWR Sacramento 916-5740712 Mohan.niroula@water.ca.gov

1) Resource eligibility to meet FCR obligation by categories

The 5th revised straw proposal describes the flexible capacity must-offer obligation as "technology agnostic" and has created four categories of resources that can satisfy an LSE's flexible capacity requirement. Although each category of FCR resource seems to be performance-based instead of technology-based, Category 1 imposes the requirement that the resource cannot be a use-limited resource. That restriction should be removed, because any resource—even a use-limited resource—that can satisfy the performance requirement of being able to operate continuously between 5:00am and 10:00pm should be classified as a Category

1 resource.

For example, the current proposal would prevent hydro resources, which are defined by the tariff as use limited resources by default, from being eligible to be designated as Category 1 resources. CDWR does not agree with this proposed provision. The must offer obligation for 17 hours a day for a Category 1 resource can be met by a use limited resource such as some hydro resources. As long as a capacity portion of a use limited resource can make it available for 17 hours, there should be no restriction to count it as Category 1 resource. Therefore, Category 1 resource should have the ability to make it available for 17 hours and should not be prevented from it being used as a Category 1 resource on the basis of use limited resource status.

ISO Response

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed "unlimited" and "limited flexibility" categories into a single category, named "base flexibility" and would allow use-limited resources to provide base flexibility.

The ISO has combined the previous "unlimited" and "limited" categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs, which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details.

2) Allocation of Flexible Capacity Requirement (FCR) obligation to LRAs:

a) CDWR supports ISO's rejection of PG&E's proposal to allocate FCR to Local Regulatory

Authority (LRAs) based on non-coincident period net load ramp. Allocation of FCR based on each LRA's coincident contribution to the requirements of FCR is an appropriate approach, based on contributions to the largest net load ramps CAISO must meet.

b) As proposed, each LRA would be allocated an FCR based on its average coincident contribution to the top five 3 hour net load ramps. All LSEs can satisfy their FCR using the same, fixed percentage of Category 1, Category 2, Category 3, and Category 4 resources. This is true even if an LSE, compared to other LSEs, contributes proportionately less to the 3 hour ramp labelled 'D' and more to the 3 hour ramp labelled 'A'. So an LSE may be obligated to provide proportionally more Category 1 resources to satisfy its FCR compared to the amount that LSE contributed to the 'D' ramps. In contrast to the assumption that each LSE will have the same proportion of each category of resource in FCR allocation, in practice, proportions of each category of FCR resource could vary by LSEs depending on their historical load pattern and the intermittent resource portfolio. CAISO should present an analysis of whether it would be appropriate to allocate individual Category 1, 2, 3, and 4 requirements based on an LRAs specific contributions to the four types of ramping needs identified as A, B, C, and D on page 25 of the proposal. For example, for 2014, the analysis could be done for each LRA anonymously and published or could be provided to each LRA separately in a confidential manner.

ISO Response

The ISO has assumed specific allocation of each LSE, like peak load ratio share, is confidential information and cannot be released. However, the ISO conducted a preliminary analysis to determine if additional granularity was required to account for LRAs' contributions to each category. In short, the ISO looked at LRAs' contributions to each of the identified categories to determine if a more complicated approach to allocating flexible capacity needs would be more consistent with causation principles. Based on the ISO's preliminary assessment there does not appear to be a significant difference between the proposed methodology and a methodology that examines a specific LSE's contribution to a particular category. As such, the ISO believes that its proposed allocation methodology is consistent with the causation principles and avoids unnecessary complexity.

3) Participating Load (PL) Eligibility for Flexible Capacity

ISO has indicated that PL resources are not currently eligible to provide flexible capacity. The

proposal should state whether a PL is eligible to provide flexible capacity or not. If not eligible, the proposal should identify requirements for a PL resource to be eligible and advise what changes a PL owner should make (if any) to be considered.

ISO Response

Restrictions/limitations in the existing PL model don't allow PL resource to offer flexible capacity. To provide flexibility PL resources will need to come under the ISO's NGR model.

4) Allocation of FCR to entities (that are not CAISO LSE) relying on intermittent resources from the CAISO BAA

There should be an assessment of the reliance on renewable resources (existing in the CAISO BAA) by entities outside CAISO BAA without a CAISO load-share, that are using those renewable resources as imports from CAISO BAA to meet their own compliance objectives in their balancing authority area, yet are not being allocated FCR as their load is outside CAISO. Cost causation principles would require all entities that rely on intermittent resources that exist within the CAISO BAA to be responsible for the FCR such resources would cause.

ISO Response

Allocating an RA requirement to generating resource is a significant change to the current RA construct. While the ISO believes that this proposal likely merits additional consideration, such changes to the RA construct is beyond the scope of the current stakeholder initiative.

Company	Date	Submitted By
California Large Energy Consumers Association	1/31/2014	

Comment 1

CLECA offers these limited comments on the 5th FRAC-MOO proposal. The ISO is forecasting its ramping needs for future years (through 2016) and proposes a combination of four categories of flexible resources to be used by LSEs to meet their future flexible capacity obligations. Category 1 resources can meet all of the ramping needs but, at a minimum, must meet the smallest secondary 3-hour load ramp for each month. The amount of Category 2 resources must not exceed the difference between the magnitude of the smallest 3-hour secondary net-load ramp and the largest 3-hour secondary net-load ramp. Category 2 resources can be used to meet Category 3 and 4 requirements. The amount of Category 3 resources must not exceed the difference between 95 percent of the monthly maximum flexible capacity requirement and the largest secondary 3-hour net load ramp. Category 3 resources may be used to meet Category 4 requirements. Category 4 resources cannot exceed five percent of the maximum 3-hour net-load ramp of the month.

ISO Response

No response required.

Comment 2

The proposal provides for the possibility that preferred resources that can be flexible have an opportunity to be procured as Flexible RA Capacity. However, the structure of the proposal makes it easiest for gas-fired resources to meet the requirements in all four categories. If there is interest in using preferred resources, an LRA could direct the LSEs under its jurisdiction to start filling Flexible RA “buckets” starting with Category 4 and moving to Category 3, etc., using preferred resources to the extent possible. California energy policies and the Loading Order should lead the CPUC to take this approach.

The proposal notes that the basis of the flexible capacity requirement is the maximum 3-hour upward ramp and that the ISO will continue to assess the need for an explicit downward flexibility requirement. (5th proposal at p. 29, FN 23.) Preferred resources such as intermittent renewable resources will be better able to provide downward flexibility (via curtailment) than upward flexibility. DR should be able to provide both downward and upward flexibility; thus, the potential role of these resources may not be adequately reflected in the proposal at this time. As minimum load problems increase, downward flexibility is likely to be very valuable; the next iteration of the flexible RA capacity requirements should include provisions for resources to provide downward as well as upward flexibility.

The ISO, however, has yet to develop rules for dispatchable DR so that DRPs and LSEs can develop programs to provide this flexibility product. One of the outstanding issues is that a product that reflects the ability of DR to both increase and decrease load has not yet been developed. The ISO should focus now on developing the appropriate rules for dispatchable DR, first raised in a stakeholder meeting almost two years ago.

ISO Response

The ISO's shift to technology agnostic buckets was made to address the ISO flexible capacity needs. The ISO is the agency with best ability to determine these needs. The LRA still has the ability to determine what portfolio of resources their jurisdiction LSE's can or should procure. Therefore, while the ISO has set the levels of the categories, it is up to the LRA to determine if procurement within a category should be dedicated to a specific resource technology.

The ISO will continue to assess the need for a downward flexible capacity requirement as part of future stakeholder initiatives and in conjunction with LRAs.

Comment 3

In addition, there is still some confusion about the definition of use-limited resources as it applies to the four categories, particularly with respect to storage and DR. If a resource is not needed, is that a use limitation? For example, whether or not a resource is needed for upward ramping during a period, it could have value for downward ramping in a subsequent period, e.g. during overgeneration. It should not be denied credit for this flexibility, but that appears to be the

result under the current fifth FRAC-MOO proposal. This should be specifically addressed and corrected in the final FRAC-MOO tariff.

The proposal intends to use historical load data but forecast renewable output; this raises the question of how the ISO will forecast the impact on load of successive levels of dynamic rate design – which have been introduced and will apply over time to more and more customer classes. There will be a built-in lag due to the use of historical load data. The ISO says it will, as part of its flexible capacity requirement assessment, use a study methodology that captures the flexible capacity needed to reliably operate the system "while properly considering the resources that have the potential to modify the net-load curve such as load modifying demand-side management (i.e. energy efficiency and demand response that is not bid into the ISO market)." (5th proposal at p. 3.) It is not clear how this "proper consideration" can be reflected on a forward basis when the ISO relies on historical data. It appears that the ISO intends to address this through a stakeholder process. Successful stakeholder processes are driven by participation and input from key stakeholders. The CPUC, the CEC, and representatives of load are familiar with the impacts of EE, DR, and dynamic pricing; these key parties must be actively engaged in and able to impact the determination of the methodology to appropriately capture net-load curve modifications from demand-side management.

ISO Response

The proposed counting provisions cover the measurements for a three hour upward ramp. Use-limitations are not defined based on whether a resource is needed. For example, the proposed counting provisions do not assume anything about the level of load or output for any single resource. The dispatch of a resource is based on the ISO market optimization.

While dynamic rates are best addressed in the flexible capacity requirements assessment, it is also important to note that the ISO will use the CEC load forecast, which, as the ISO understands will consider the impact of dynamic rate programs. We hope to actively engage members of the DR, EE, and dynamic pricing communities in this study process.

Comment 4
Lastly, CLECA is concerned about test events. The CPUC has proposed its own procedure for testing the availability of resources like DR for RA purposes. The ISO proposal suggests that it intends its own test events for EFC for Flexible RA. While the ISO notes that it must coordinate its proposed testing with that of the CPUC and other LRAs, the resource should not be subjected to two different tests just because the RA time window is different from the Flexible RA time window. Furthermore, the ISO proposes to compare the load change to the previous ten days of load data to measure the load reduction whereas the CPUC proposes to use the Load Impact Protocols; these two measures are inconsistent. The CPUC should have responsibility for determining the testing requirements for resources used by LSEs under its jurisdiction, whether for System RA or for Flexible RA.
ISO Response
The ISO believes that the proposed CPUC and ISO test events for DR resources are reasonably well aligned and should mitigate the need for duplicative tests. It should also be noted that the measurement proposed by the ISO is comparable to the measure for PDR resources.

Company	Date	Submitted By
California Wind Energy Association	1/31/2014	Dariush Shirmohammadi e-mail: dariush@shirconsultants.com phone: 310-858-1174 Nancy Rader e-mail: nrader@calwea.org phone: 510-845-5077

Opening Comments

The California Wind Energy Association (CalWEA) appreciates the opportunity to comment on the California Independent System Operator's (CAISO's) fifth revised straw proposal on Flexible Resource Adequacy Criteria and Must-Offer Obligation (FRACMOO). In general, CAISO's FRACMOO Proposal is intended achieve three objectives:

1. Ensure that CAISO will have sufficient flexible capacity available in order to reliably manage the operation of its controlled grid;

2. Ensure that all sources of flexible capacity (of all technologies and sizes) are properly assessed for their qualifications to provide such capacity and are properly assigned proper credit for providing flexibility service to CAISO; and

3. Properly allocate the need for Flexible Resource Capacity (FRC) procurement to the Local Regulatory Authorities (LRAs) and/or Load-Serving Entities (LSEs) in the CAISO's footprint based on the contribution of these entities to the overall FRC requirement by accounting for their overall supply/demand variations as well as their renewable procurement strategies.

The CAISO's latest FRACMOO proposal by and large addresses the first two objectives. This latest FRACMOO proposal also better achieves the third objective by allocating the FRC requirement in a way that better accounts for the impact of some of the factors that contribute to the need for FRC, namely variations in the load of each LSE and variations in the wind, solar-

PV, and solar-thermal generation within each LSE portfolio. The improvement mainly comes from the intention to incorporate these forecasted variations during the five steepest net-load ramps during the month. However, the allocation formula requires further modification to fully account for all the significant drivers of the FRC need -- the needs attributable to distributed resources and fixed generation and import schedules. In that regard, we would like to make the following critical points:

ISO Response

The ISO has added clarity to the proposal in footnotes 18 and 19 to demonstrate that almost all distribution level resources should be accounted for in allocation methodology.

Comment 1

a) The contribution of Distributed Energy Resources to FRC procurement must be explicitly and accurately identified. CalWEA strongly objects to CAISO removing the change in Distributed Energy Resources from the allocation factors for the following reasons:

• The state is in the midst of an explosive rise in distributed renewable energy (including solar rooftops); thus, relying on historical information on the performance of distributed energy resources subsumed in load variation is likely to result in an erroneous (and thus unfair) allocation of the FRC requirement, especially given the common understanding that one of the two major ramps in the day is due, in significant part, to variations in the output of distributed resources; and

• By subsuming the contribution of distributed energy resources within load, the ISO would mask the impact that these resources are having on the cost of grid operation. This information is needed to inform policy makers about the integration costs associated with distributed resources and related policies. The main objective of this exercise is, after all, to inform LSEs and policymakers about the indirect costs associated with the procurement decisions and procurement choices that they make.

The CAISO can readily access from LSEs all the data that is necessary to explicitly forecast and account for the impact of “Δ Distributed Energy Resources.”

ISO Response
The ISO has added clarity to the proposal in footnotes 18 and 19 to demonstrate that almost all distribution level resources should be accounted for in allocation methodology.
Comment 2
b) The FRC allocator presented in all FRACMOO proposals attempts to identify all the "uncontrollable" drivers of the 3-hour maximum net-load ramp, but misses one of the biggest of these "uncontrollable" drivers: the LSEs' fixed import/generation schedules. The impact of these schedules must be added into the FRC allocator to reflect the impact that they have on the procurement of FRC. Given that the CAISO performs the allocation on forecasted system condition, the data to determine the FRC allocation to fixed schedules should be readily available to CAISO.
ISO Response
It is not clear to the ISO that fixed import/generation schedules increase the three hour net load ramp. While the statement asserts that such schedules are "the biggest uncontrollable drivers," it does not provide support for this claim, nor does provide a proposal as to how fixed import schedules should be included in the flexible capacity requirement. Finally, the ISO believes that additional discussion regarding how fixed import schedules should be included in the ISO flexible capacity requirements should be addressed in the flexible capacity requirements assessment.

Company	Date	Submitted By
Calpine Corp.	1/31/14	Matt Barmack barmackm@calpine.com 925-557-2267
Opening Comments		
Calpine appreciates the efforts of CAISO staff to develop a proposal that is readily implementable and assures reliability. Calpine's comments focus on the definitions of the		

Flexible Capacity Requirement Categories (“FCCs”) in section 5.4 and the associated must-offer obligations in section 5.5.

ISO Response

No response required

Comment 1

First, Calpine requests clarification of the justifications for the FCCs. While the FCCs seem reasonable, Calpine would like to understand better the analytic and reliability justifications for the categories.

ISO Response

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed “unlimited” and “limited flexibility” categories into a single category, named “base flexibility” and would allow use-limited resources to provide base flexibility.

The ISO has combined the previous “unlimited” and “limited” categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs, which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details.

Comment 2

Second, Calpine has a specific concern about the definition of the must-offer obligation for category 2 resources. The definition appears to require use-limited resources to be able to start twice per day in order to qualify for category 2. Calpine believes that the definition should be generalized so that use-limited resources that are capable of ramping over their Effective Flexible Capacities, regardless of whether doing so requires starting, qualify for category 2. There may be CCGTs that are use-limited due to limitations on starts that nevertheless are capable of ramping over their EFCs multiple times in a day.

ISO Response

The ISO has provided additional clarifications to the minimum availability requirements and must offer obligations in sections 5.4 and 5.5 of the draft final proposal.

Comment 3

With respect to the definition of FCCs, Calpine would like to understand better how they are supported by the CAISO's analysis and whether they fully address the CAISO's reliability requirements. In particular, Calpine would like to understand the following:

With respect to Category 1 and 2 resources, what is the analytic basis for the CAISO's proposed requirements to procure non-use-limited (Category 1) resources? If flexible capacity requirements are related to the ability to satisfy up to two three hour ramps per day, why are resources with more energy than necessary to meet two three hour ramps needed, i.e., couldn't sufficient Category 2 resources satisfy all three hour ramps, including both primary and secondary ramps, in a month? If Category 1 resources are needed to address requirements other than three hour ramps, what are those requirements?

With respect to all FCCs, Calpine requests clarification of the durations (in days) of various resource needs. For example, could some portion of Category 2 requirements be satisfied with resources that meet the Category 2 requirements but only for a subset of days within a month? Relatedly, as the CAISO suggested at the last stakeholder meeting, is the limit on Category 4 resources based (loosely) on an analysis of the frequency of the most extreme ramping events?

ISO Response
The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed “unlimited” and “limited flexibility” categories into a single category, named “base flexibility” and would allow use-limited resources to provide base flexibility. The ISO has combined the previous “unlimited” and “limited” categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs, which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details The ISO has provided additional clarifications to the minimum availability requirements and must offer obligations in sections 5.4 and 5.5 of the draft final proposal.
Closing Comments
Again, Calpine thanks CAISO staff for addressing a very complicated set of issues pragmatically and looks forward to the next version of the proposal.
ISO Response
No response required.

Company	Date	Submitted By
Cogeneration of California	1/31/14	

Opening Comments

The Cogeneration of California (CAC) and the Energy Producers and Users Coalition (EPUC) appreciate the willingness of ISO staff to continue to discuss the treatment of combined heat and power (CHP) facilities in determining Effective Flexible Capacity. CAC and EPUC provide the following comments to augment the proposal so that it is feasible for CHP facilities while maximizing the amount of dispatchable flexible capacity available to the ISO from these facilities.

ISO Response

No response required.

Remaining Issue with ISO Straw Proposal

On pg. 33 of the Fifth Straw Proposal, the ISO states:

> *The ISO believes that the reliability must take portion of these resources' should be treated the same way as a PMin with greater than a 90 minute start-up time.*

We assume, based on that language, that the formula for determining EFC for CHP would be NQC-RMTMax. Use of this metric would result in an EFC of zero, if not a negative number, for most CHP resources. RMTMax is set based on the maximum possible obligation of delivery of thermal energy to the CHP unit's thermal host. Put another way, RMTMax is the maximum electric energy the unit would export to the grid while it is concurrently producing the required thermal energy for the industrial host, and it is the amount of power the ISO is required to accept without curtailment[5] to facilitate that operation.

[5] Except for system emergencies.

On the other hand, the NQC for these CHP resources is set according to the CPUC Resource Adequacy Manual based on a three-year rolling average of production. This produces an NQC that is obviously an average of historical performance, not a maximum potential generation.

Many CHP resources are sized to meet the thermal obligations to their industrial host. Because of this, their exports to the grid historically have been determined by their deliveries to their host. Thus, their RMTMax is set at or above their NQC. NQC-RMTMax for these facilities will be zero or a negative number. Yet, at least some of these facilities can be operated to provide some flexible capacity available for ISO dispatch.

Each CHP unit can be unique in both its configuration and its operating constraints. Some CHP units are bottoming cycle, and start with an industrial process producing waste heat, such as petroleum coke calcining or cement manufacturing. Some topping cycle units generate electricity from a combustion turbine and then produce useable thermal energy from the waste heat. Others start with a steam generator, generate electricity in a steam turbine, and then apply the waste heat to an industrial process. These options in technology mean each unit offers differing flexibility.

Each unit also may have unique contractual and operational constraints in serving its industrial host. Depending on the nature of that industry, the cogeneration unit may be able to generate excess electricity or it may be able to coordinate variations in thermal output with dispatchable variations in electricity output.

For these reasons, each CHP unit may have a unique ability to produce flexible capacity, and should be able to designate that capacity. A simple arithmetic formula does not capture the variance in capabilities of these units. Rather than apply the same formula to each CHP unit, CAC and EPUC propose that each unit designate its own EFC. The EFC could be no greater than the NQC for the unit. The CHP unit would then have the comfort that it can actually produce its identified EFC, as it may offer it in contract. The ISO would be assured, both by the unit's contractual obligations and the ISO penalty provisions, that the unit would deliver its EFC

as actually sold in the market. The final policy document on flexible capacity should provide that:

> *A CHP resource will be permitted to designate an EFC value annually for each month of a counting year to reflect its unique operating requirements related to industrial host obligations or CHP contract limitations, provided that it does not exceed the NQC of the resource. This will ensure that a CHP's Must Offer Obligation does not interfere with its ability to self-schedule.*

Candidly, many CHP units are concerned that if an EFC value is identified for their facility, they will be required to provide that full amount, regardless of either their business preference or their physical capabilities. For this reason, and to ensure that any flexible capacity protocol as adopted by the ISO is consistent with the QF/CHP Settlement and with the Net Scheduled Participating Generator Agreement, the final policy document on flexible capacity should explicitly provide that:

> *1. Flexible Capacity is not intended to diminish a CHP resource's ability to self-schedule into the ISO's Day-Ahead and Real Time markets.*
>
> *2. A CHP resource, or any generating resource, will have the ability to designate or sell any portion of its designated EFC as "generic capacity." Such generic RA capacity would have the option to submit either self-schedules or economic bids, but would not have the flexible RA capacity Must-Offer Obligation to submit economic bids*

ISO Response

The ISO has also reviewed the counting criteria for combined heat and power (CHP) units or similar resources that are tied to a primary industrial process where electricity is a byproduct. The ISO proposes to calculate the EFC of CHP resources in the same manner as proposed for other conventional resources. The ISO understands that there are a variety of different type of CHP resources and that using the same EFC calculation may not fully capture specific industrial considerations that might reduce the amount of EFC a CHP resource might wish to sell for a given month or year. However, CHP resources, along with any generating resource, will have

the ability to designate any of its capacity EFC as “generic capacity” based on the underlying industrial processes. Such generic RA capacity would have the option to submit either self-schedules or economic bids, but would not have the flexible RA capacity must-offer obligation to submit economic bids. However, any CHP capacity listed as flexible capacity that is self-scheduled for the hours for which flexible capacity is required to submit economic bids will be subject to charges under the flexible capacity availability incentive mechanism, once put into place. Additionally, some of CHP resources have a “reliability-must-take” capacity amount listed in the ISO’s master file. The reliability-must-take portion of the resource is set based on the maximum possible obligation of delivery of thermal energy from a CHP unit’s thermal host. The ISO believes that the reliability must take portion of these resources’ should be considered by the SC for the CHP resource when determining how much flexible capacity it wishes to list as RA flexible capacity. This could reduce the amount of EFC listed by some qualifying facilities, but would ensure that the resources are better able to maintain flexibility consistent with their underlying industrial processes. As with other resources, the EFC for combined heat and power resources will be limited by the resource’s NQC.

Company	Date	Submitted By
ENERNOC		

Introduction

EnerNOC, Inc. (EnerNOC) appreciates the opportunity to comment on the latest version of FRACMOO V.5. One of the significant changes reflected in FRACMOO V.5 is to move away from individual resource requirement specifications to qualify as a flexible resource and, instead, develop a categorization of resource needs based upon the differences between the primary and secondary maximum and minimum ramping needs of the CAISO. CAISO has identified four categories of ramping resource needs.

Category 1: No use limitations. Available to be dispatched between 5 AM and 10 PM; A minimum amount of Category 1 resources must be set, depending about the monthly relationship of the smallest 3-hour, secondary net load ramp. Traditional generation resources and wind resources can participate in this category. Category 1 resources may satisfy the requirements for Categories 2, 3 and 4.

Category 2: Limited flexibility. Available between 5 AM and 10 PM to be dispatched up to twice/day for up to 6 hours, reflects the difference between the largest and smallest secondary 3-hour net load ramp. Examples of Category 2 resources include hydro resources, long discharge storage, use-limited gas-fired generation. Category 2 can satisfy the requirements for Categories 3 and 4.

Category 3: Peak Flexibility. Can be use limited. Resource is available for a five-hour period, to be seasonally specified by the CAISO. Resource is required to provide up to 3 hours of energy when dispatched. The ramping requirement for Category 3 is determined by the difference between 95% of the monthly maximum 3-hour net-load ramp and the largest secondary 3-hour net load ramp. Resources that can meet the Category 3 requirements include solar and gas-fired peaking generation. Category 3 resources can meet Category 4 requirements.

Category 4: Super Peak Flexibility. Can be use limited. Resource is available for a 5-hour

period, which is seasonally-determined by the CAISO. Resource must be capable of being dispatched up to 3 hours, up to 5 times per month. Category 4 is capped at 5% of the monthly maximum 3-hour net-load ramp. Resources that could participate in this category include DR. EnerNOC supports the categorization of need and the development of specific categories of need that can be met by resources with appropriate attributes. However, EnerNOC has certain concerns as identified below.

ISO Response

No response required.

SYSTEM RESOURCE NEEDS VERSUS RESOURCE-TYPE DEFINITIONS

CAISO explained its desire to move away from developing resource-specific definitions for providing flexible capacity versus defining the needs of the system and allowing resources to meet that need. EnerNOC appreciates that developing individual resource type qualifications can be complex and, as stated above, does not object to the CAISO's proposal of identifying categories of resource needs on its system and allowing resources to satisfy those needs. It may be difficult to address all of the disparate resource characteristics in a manner that would allow those resources to contribute to providing flexible capacity to the CAISO. That said, there is a precedence for defining the resource characteristics, by resource type, for providing a service in other markets, like the PJM capacity market.

EnerNOC supports the overall construct proposed by CAISO in FRACMOO V.5, which develops resource categories to meet the overall flexible capacity need defined by CAISO. This is a clean, more causal way to define flexible resource characteristics to match the need on the system. Those resource categories allow a varied range of capacity resources to participate, based upon the operational requirements of the category. Category 4, for example, has been identified as compatible with DR resources, although, DR could participate in any of the categories to the extent that DR can meet the resource requirements.

ISO Response

The ISO is aware of the DR capacity options available in PJM. However, the procurement structure in California is significantly different from that of PJM, limiting the strength of the comparison.

The ISO proposal would not limit the opportunities for DR, or any resource, to provide flexible capacity so long as the resource is able to meet the minimum operating requirement of the category for which it is shown as flexible.

CATEGORY LIMITATIONS

As stated above, CAISO has developed a "causal" way of developing the categories of resources that will satisfy its 3-hour ramping need. However, it is clear from this calculation, that CAISO doesn't require a resource to be available to be dispatched over a 17-hour period for its entire ramping need. According to Figure 4, page 29, and Table 2, page 27, no more than approximately 2,000 MW of a total maximum 3-hour ramping need of around 9,600 MW would need to come from Category 1 resources. Even then, the CAISO has not provided evidence that the resource would need to be available to be dispatched across that entire 17-hour period. A resource that is dispatchable across a 17-hour period, without use limitation, does not exhibit flexibility to meet interim ramping requirements. It is a base-load resource. Nonetheless, EnerNOC does not object to having a certain amount of resources available for a more constant level of generation, such as to meet the smallest, 3-hour secondary net-load ramp. However, EnerNOC does object to allowing that resource to displace the other resource types that could fulfill the other Categories of ramping need. That is an undue preference for one type of resource. Therefore, Category 1 resources should be held to a maximum, based upon CAISO's calculations, as should Categories 2, 3 and 4.

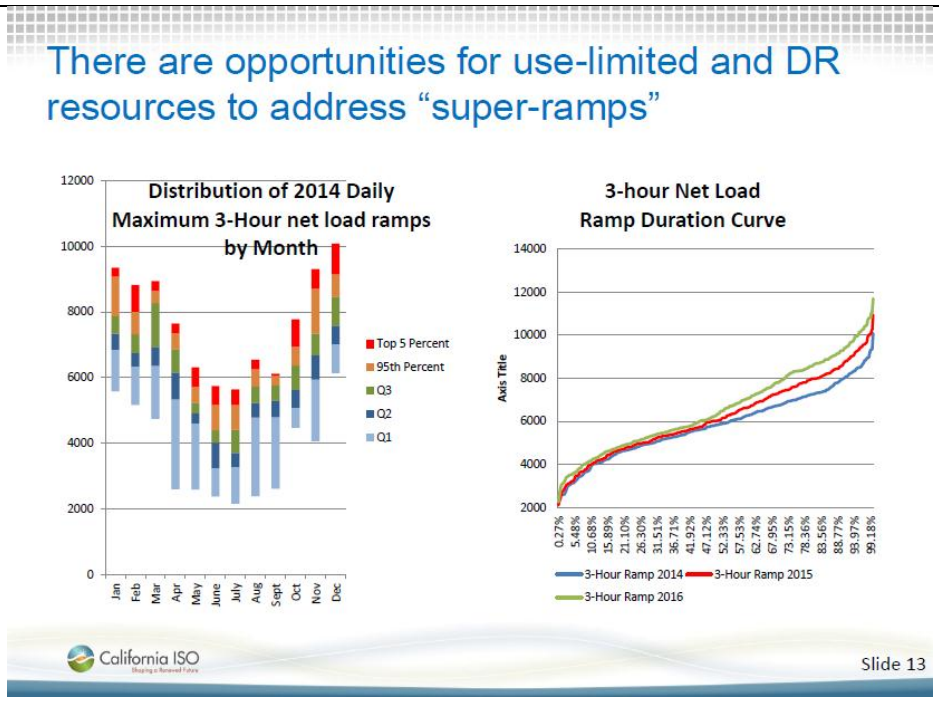
Only to the extent that Categories 2, 3 and 4 are not filled by resources appropriate to those categories, should CAISO permit preceding Categories to "backfill" an unmet capacity need. Displacing other resource types is especially concerning in a forward resource adequacy requirement and commitment period. In other words, Category 2, 3 and 4 resources could be prevented from participating for a multi-year period. Further, resource development is not going to occur in Categories 2, 3 or 4 if those resources are always displaced by gas-fired generation. To allow that displacement to occur would de-legitimize CAISO's own analysis in developing other categories of resource needs.

In March 2013 at a CPUC Workshop, CAISO presented an analysis of a "super-ramping" resource need with a distribution of occurrence in about 5% of the hours of the year. CAISO has, in FRACMOO V.5, established a maximum "Super Peak" ramping cap of 5% of the maximum monthly 3-hour ramping capacity. EnerNOC would like to note that in CAISO's March 2013 presentation, Slide 13 (shown below), the super ramping resource constituted, in some months, more than 5% of the maximum 3-hour ramping capacity. As such, CAISO has not

presented an analytical basis for capping Category 4 at 5% of the monthly maximum ramping need. The calculations of the amount of resource needs for both Categories 3 and 4 are, therefore, somewhat rigged by virtue of capping Category 4 at 5%. With that said, however, as an interim measure while all parties gain experience with providing FRACMOO, EnerNOC is willing to entertain this cap, so long as there is a willingness to explore the alternative calculations based upon CAISO's previous analyses.

Table 2: Assessment of Various 2014 Forecasted Net-Load Deviations

Month	Monthly Maximum 3-hour Net-Load Ramp	Smallest Daily Maximum 3-hour Net-Load Ramp of the Month	Largest Secondary 3-hour Net-Load Ramp	Smallest Secondary 3-hour Net-Load Ramp	Largest 15-Minute Net-Load Change	Largest 60-minute Net-Load Change	Largest 90-minute Net-Load Change
Jan	9,148	5,561	7,517	1,453	1,942	5,389	7,113
Feb	8,555	5,054	6,866	1,923	1,639	4,665	5,873
Mar	8,324	4,684	6,723	340	1,400	4,525	6,022
Apr	7,102	2,655	5,985	1,778	1,505	3,750	4,878
May	5,843	2,477	5,276	932	1,282	3,005	3,953
Jun	6,161	2,529	3,088	995	994	2,921	4,033
Jul	6,038	1,688	4,133	1,336	1,073	3,104	3,850
Aug	6,812	2,319	4,325	1,944	1,364	2,752	3,978
Sep	6,239	2,767	5,038	1,655	1,256	3,401	4,221
Oct	7,304	4,412	6,014	2,147	1,393	3,940	5,432
Nov	8,789	4,219	6,297	1,380	1,593	4,820	6,417
Dec	9,635	5,777	7,115	1,391	2,118	5,434	7,275



ISO Response

The ISO's shift to technology agnostic buckets was made to address the ISO flexible capacity needs. The ISO is the agency with best ability to determine these needs. The LRA still has the ability to determine what portfolio of resources their jurisdiction LSE's can or should procure. Therefore, while the ISO has set the levels of the categories, it is up to the LRA to determine if procurement within a category should be dedicated to a specific resource technology.

USE LIMITATIONS

There was quite a bit of discussion as to what constitutes use limitations. For example, energy storage could have charging periods, when it is not available to discharge, but could charge when the system is in an over-generation condition and that may not constitute a use limitation, as discussed at the January 23rd stakeholder meeting.

A parallel construct for DR would be to reduce load for a morning or afternoon ramp, but increase load during the middle of the day, when the duck chart indicates an over-generation problem. Such a construct could be helpful to the system in that it flattens out the belly of the duck and reduces the amount of ramp needed in the evening. At this point in time, that construct to help with mid-day over-generation has not been discussed.

Further discussion on use limitations would be helpful as it was not well resolved in the stakeholder meeting.

ISO Response

While the ISO believes incremental demand response has the potential to provide additional flexibility, additional discussion is needed to explore the utility and applicability of the load impact protocols to measure incremental demand response. Further evaluation is required before the ISO could support, and make a decision to include, incremental demand response as flexible capacity.

The ISO has provided additional clarifications to the minimum availability requirements and must offer obligations in sections 5.4 and 5.5 of the draft final proposal.

IDENTIFICATION OF SEASONAL AVAILABILITY HOURS FOR CATEGORIES 3 AND 4

At the Stakeholder Meeting, CAISO indicated that the 5-hour availability window for Categories 3 and 4 would be seasonally determined by the CAISO. It was not clear if the 5 hour windows that were identified in previous FRACMOO Versions (4) would still be in place.

This issue is important for various reasons, including the ability to contract with LSEs for flexible RA purposes.

ISO Response
The ISO proposed 5-hour offer window will be set based on the maximum three hour net load ramp. Resources will not have an option regarding a.m. or p.m. as was offered in previous versions of the ISO proposal.
KEEPING FLEXIBLE RA AND GENERIC RA SEPARATE FOR DR IS STILL A CONCERN
As has been stated in previous comments, DR Providers (DRPs) will assemble portfolios to meet specific resource characteristics. Generic resource definitions and flexible resource definitions are going to be different. EnerNOC will recruit customers who can meet one or the other resource characteristics. It will be unusual for a customer to be able to meet both. As such, EnerNOC will renew this concern relative to this version of FRACMOO.
ISO Response
As the ISO will not require a resource be shown on both the generic and flexible RA showings, it is conceivable that a resource could be shown on only one showing, thus the resource would not need to provide both generic and flexible capacity to the ISO.
VALUE AND REPLACEMENT OBLIGATIONS
While these issues have been tabled for the time being, the value of the resource and the replacement obligations will have a considerable amount of weight as to whether customers perceive participation as a flexible capacity resource favorably or not.
ISO Response
The ISO will address this issue as part of the Reliability Services Initiative.

Company	Date	Submitted By
Independent Energy Producers Assoc	1/31/2014	Steven Kelly Policy Director IEP 916-448-9499 steven@iepa.com

Opening Comments

IEP appreciates the opportunity to provide these brief comments to the CAISO's "Market and Infrastructure Policy: Fifth Revised Straw Proposal" (dated January 17, 2014). IEP's understanding is the CAISO proposes to circulate a Draft Final Proposal on February 7, 2014 in order to incorporate and/or clarify various issues raised by stakeholders. Accordingly, IEP comments herein are not an endorsement of the CAISO's Flexible Resource Adequacy Criteria and Must-Offer Obligation per se pending our review of the Draft Final Proposal.

ISO Response

No response required.

Comment 1

First and foremost, as a general matter, IEP supports the approach proposed by the CAISO in this Fifth Straw Proposal with regards to the Flexible Resource Adequacy Criteria and Must-Offer Obligation, i.e. the so-called FRACMOO proposal. Unlike the prior proposals, this latest proposal applies a "product-based" approach based on the operational needs of the CAISO and operational capabilities of suppliers. We believe this is the proper general approach to pursue, rather than technology-based capacity availability determinations.

ISO Response

The ISO appreciates the support for this aspect of the proposal

Comment 2

Second, IEP recommends that the next iteration, e.g. the Draft Final Proposal, clarify three additional points not raised in the stakeholder meeting on January 23, 2014:

1. We request that the CAISO clarify how various technologies and/or resources are anticipated

to “fit” into the various “flexible capacity categories.” We think it would be helpful to include some brief examples of how, for example, storage and DR resources are anticipated to fit, and their concomitant obligations depending on their must-offer obligation. Particularly for the so-called “preferred resources,” the details matter and a full understanding among all stakeholders as to how these resources are expected to participate in this general approach would be helpful.

2. We request that the CAISO clarify how flexible ramping product and the flexible ramping constraint fit together in the context of the FRACMOO proposal. What is the relationship between these two functions? We believe that they are connected, but the latest straw proposal was ambiguous on this matter.

3. We request that the CAISO elaborate more fully on the extent to which CHP will be afforded the flexibility to self-schedule in the CAISO flexible capacity market(s). CHP is uniquely positioned to provide energy efficiency and GHG emissions reductions, and IEP believes that if properly designed the CAISO flexible capacity market may elicit additional flexible capacity supply from CHP resources. To accomplish this positive outcome, however, CHP requires the opportunity to self-schedule its available flexible capacity to the CAISO. While the details of CHP self-scheduling need to be addressed in more detail in the stakeholder process, for example to ensure against double-counting of CHP-derived flex capacity, IEP urges the CAISO to develop some broad parameters for this to be achieved and integrate the concept into the Near Final Draft Proposal.

ISO Response

In response to point 1:
The ISO has provided additional clarifications to the minimum availability requirements and must offer obligations in sections 5.4 and 5.5 of the draft final proposal.

In response to point 2:
The ISO is designing the flexible ramping product. This product will help the ISO efficiently dispatch flexible capacity resources in real-time. Just as there is an energy product in the market and a forward capacity requirement to be able to produce energy, it is appropriate to

have a forward flexible capacity requirement to ensure there is sufficient flexible capacity to bid into the ISO markets.

In response to point 3:
See the response provided to Cogeneration of California, above.

Comment 3

Third, the CAISO proposes to apply the Capacity Procurement Mechanism ("CPM") to address deficiencies in an LSE's flexible capacity procurement. IEP notes that the CPM was developed and implemented in the context of deficiencies in an LSE's generic capacity obligation (system and/or local). Flexible capacity, as noted by the CAISO, is a different product. While IEP can appreciate the necessity of moving forward with a flexible capacity construct as soon as possible, and the availability of the CPM for 2015 facilitates this outcome, we do note that the current CPM expires in early 2016. The CAISO will soon initiate a stakeholder process to consider a replacement for the current CPM. In this regard, to the extent that the CPM is to apply for flexible capacity, then the CPM must be developed in recognition of the disparate values associated with system, local, and flexible capacity resources. A "one-size-fits-all" structure may not be just and reasonable in this context.

ISO Response

The ISO will take up this matter in the Reliability Services Initiative.

Company	Date	Submitted By
Marin Clean Energy	1/31/2014	Andrew B. Brown Ellison, Schneider & Harris, LLP 2600 Capitol Avenue, Suite 400 Sacramento, CA 95816-5931 T: (916) 447-2166 F: (916) 447-3512 C: (916) 849-2070 abb@eslawfirm.com http://www.eslawfirm.com

Opening Comments

The following comments are submitted on behalf of Marin Clean Energy ("MCE"), a Community Choice Aggregator providing retail service within a geographically defined location inside the PG&E TAC that includes Marin and Richmond areas. (See https://mcecleanenergy.com/)

ISO Response

No response required.

Comment 1

MCE generally supports the revisions insofar as they help narrow the procurement obligation and expand the potential resource types that could be used to provide flexible capacity needs. The overall structure needs to be clear and durable in terms of how the individual LSE's net load contribution to max ramp requirements is calculated. Durability of the calculation methodology is important because the incentives that the FRAC-MOO RA program element creates is for a LSE to manage their net load and resource impacts on the grid. Because the types of resources (generation, EE, DR and storage components) that can help minimize an LSE's net load change can require significant investments, MCE is concerned about the potential regulatory risk created if the FRAC obligation determination or the eligibility of resources to provide the FRAC product can be altered over time. Accordingly, MCE believes that a priority of the proposal should be the durability of the methodologies adopted for determining FRAC requirements and resource eligibility.

Another issue that needs to be addressed (which was discussed at the last working group discussion) was to whom CAISO places the FRAC obligation. The current version contemplates imposing the obligation to the LRA overseeing some set of LSEs. As noted during the discussion, there is only one LRA with multiple LSEs under its jurisdiction; namely, the CPUC. It is our understanding that other LRAs typically have one LSE, as is the case with the POUs.

MCE believes that the CAISO Tariff is not designed to pass on procurement obligations to LRAs, but rather it should be passed to those SC customers that are LSEs. Our concern is that the obligation as determined by CAISO based on cost-causation principles should not be open to alteration by another body because that could undermine the market signal associated with the FRAC need. MCE expects that the RA portions of the Tariff that use a "default obligation" based on the RA policy adopted by the CPUC, a similar approach could be used for the Flexible Capacity needs, assuming the CPUC will approve the policy underlying the CAISO proposal.

ISO Response

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed "unlimited" and "limited flexibility" categories into a single category, named "base flexibility" and would allow use-limited resources to provide base flexibility.

The ISO has combined the previous "unlimited" and "limited" categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs, which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the

ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details.

The ISO's ultimate interaction is with the SCs. However, the use of the term "allocation" in relationship to the LRAs should not be taken to mean that the ISO is placing an obligation or potential fees on the LRA. It is simply meant as a means of stating the ISO will provide to the LRAs the flexible capacity requirements to the LRA to determine how they should be allocated to their jurisdictional LSEs. The ISO will use is the allocation of the flexible capacity requirements to LSE to determine flexible capacity adequacy and any backstop cost allocations to SCs.

Company	Date	Submitted By
Northern California Power Agency	1/31/2014	

Allocation of Flexible Capacity Requirements

As described in Section 5 of CAISO's fifth revised straw proposal, NCPA supports CAISO's proposed methodology for allocating flexible capacity requirements, including CAISO's recognition of a MSS load-following LSE's preexisting contractual obligation to match supply and demand within its MSS portfolio in each applicable settlement interval. The proposed allocation methodology tracks the principles of cost causation by reflecting the contribution each load serving entity makes to the CAISO's flexibility needs through its own portfolio of resources and appropriately recognizes existing flexibility contributions.

ISO Response

The ISO appreciates the support for this aspect of the proposal.

Flexible Capacity Showings

NCPA supports CAISO's proposal to require two separate resource adequacy showings; one showing for generic capacity (system and local capacity) and one showing for flexible capacity, which provides for administrative efficiency.

ISO Response

The ISO appreciates the support for this aspect of the proposal.

Flexible Capacity Requirement Categories

NCPA believes that Use-Limited resources with operating characteristics that are consistent with the need-based requirements described by CAISO should not be automatically excluded from category 1 (unlimited flexibility). As described in Section 5.5 of CAISO's fifth revised straw proposal, a category 1 resource must have flexible capacity that can be made available to the CAISO market through economic bids submitted daily from 5:00 a.m. through 10:00 p.m., and must be able to operate continuously during all of the same hours. There are certain Use-

Limited resources that would be able to satisfy this requirement even though they are registered as Use-Limited in the CAISO master file. For example, a hydroelectric resource may have sufficient fuel (water) to operate continuously at full or partial capacity during the stated hours. The Use-Limited nature of the facility may be seasonal or longer term; for example the current reservoir storage levels may be sufficient to satisfy these operating requirements for a number of months during the year, but the resource may be categorized as Use-Limited because it cannot operate at this level for all 12 months of the year. Also, a Use-Limited hydroelectric resource may be able to satisfy the stated requirements operating continuously at a level that is less than its full capacity, but due to the fact that CAISO automatically classifies all hydroelectric resources as Use-Limited such a resource would be arbitrarily excluded from satisfying a category 1 requirement.

NCPA believes that a resource's eligibility to qualify as a category 1 resource should be based on its specific operating characteristics and capabilities, rather than on a CAISO presumption that a resource that is registered as Use-Limited cannot satisfy the requirements. Therefore, NCPA proposes that the category 1 requirements be modified so that any resource that can satisfy the following operating characteristics (regardless of whether or not the unit is registered as a Use-Limited resource) is eligible to satisfy the category 1 requirements:

- Must have the ability to start at least twice each operating day; and
- Must be capable of providing capacity and energy equal to the stated category 1 eligible capacity amount (MW equal to or less than full capacity) during the period of 5:00 a.m. through 10:00 p.m. each day during the period in which the resource provides flexible capacity

NCPA also requests CAISO to clarify in its next proposal that a single flexible capacity resource may provide flexible capacity in one or more of the stated categories. This will properly recognize that many resources have different operating characteristic and capabilities relative to different operating ranges. For example, a hydroelectric resource with a 100 MW rated capacity may have sufficient reservoir storage to satisfy category 1 or 2 requirements when operating in the range between 0 to 20 MW, and at the same time have sufficient reservoir storage to satisfy category 3 or 4 requirements when operating in the range between 20 MW and 100 MW. In this

case, such resource should not be limited to supplying flexible capacity in a single category

ISO Response

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed "unlimited" and "limited flexibility" categories into a single category, named "base flexibility" and would allow use-limited resources to provide base flexibility.

The ISO has combined the previous "unlimited" and "limited" categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs, which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details.

The SC for the LSE can select the category in which a resource is shown as long as the resource meets the category's criteria. For example, a resource that is capable of providing category 1 or 2 capacity could be shown in either or have some portion of the capacity in each depending on the LSE SC's flexible capacity showing.

Company	Date	Submitted By
Olivine, Inc.		

Opening Comments

Olivine, Inc. appreciates the opportunity to comment on the CAISO Fifth Revised Straw Proposal Flexible Resource Adequacy Criteria Must Offer Obligation paper and limits these comments in support of one particular change from previous drafts. Specifically, the change from technology-specific categories to technology-agnostic categories derived from a needs-based analysis of the system.

This revised approach is pragmatic for several reasons:

1. Adjustments to the levels of the categories can be made once historical data is available without the potential of having to reclassify technologies.
2. The fact that future adjustments can be made with the inclusion of historical data instead of completely relying on study data allowing for a more accurate assessment of need.
3. Given the number of new resource technologies being developed, defining the system requirements rather than anticipating how technologies will interact with the CAISO system provides a more reasonable framework for developers to deliver wholesale-ready resources without blocking innovation.
4. This revision better meshes with the CPUC process for defining and determining RA Qualifying Capacity and Effective Flexible Capacity for various resource technologies in R.11-10-023 by eliminating the possibility of incompatible definitions.

ISO Response

The ISO appreciates the support for the revised proposal.

Closing Comments

We recognize the urgency for getting a new framework in place for 2015, but we need to keep in mind that this will continue to require efforts in both at the CAISO and the CPUC proceedings to ensure workable solutions for the inclusion of new technologies to address renewable integration needs for 2016 and beyond.

ISO Response
The ISO will take up the issues deferred from the FRAC-MOO initiative to the Reliability Services Initiative.

Company	Date	Submitted By
Pacific Gas & Electric	2/3/2014	Marie Fontenot (415) 973-4985 Peter Griffes (415) 973-3335

Opening Comments

Pacific Gas and Electric Company (PG&E) offers the following comments in the stakeholder process for the California Independent System Operator's (CAISO) Flexible Resource Adequacy Criteria and Must-Offer Obligation (FRAC-MOO) initiative January 17, 2014 Fifth Revised Straw Proposal (Proposal).

In summary, PG&E's chief comments are:

- The CAISO has not justified the need for the complex four-category flexible RA framework;
- PG&E recommends a simplified two-type framework;
- Because of the four-category framework, PG&E does not support using Capacity Procurement Mechanism to backstop flexible capacity; and
- PG&E continues to advocate for two changes to the flexibility requirement allocation methodology.

ISO Response

Each of these issues is addressed in greater detail below.

1. The Need for the Complex four Category Framework Has Not Been Justified

The Proposal recommends four flexible capacity procurement categories with corresponding minimum and maximum procurement targets, as well as, different must offer obligations (MOO) for each category. PG&E does not support the four-category approach. In general, the framework is overly complex and not adequately supported by analysis. Moreover, this major change to the design has been introduced late in the stakeholder process (month 13 in 14 month stakeholder process) and the CAISO has not allowed stakeholders adequate time to vet its limited analysis.

Specifically, the CAISO's proposal:

- Introduces new flexible capacity "products" by creating multiple definitions of "flexibility;"
- Infringes upon the jurisdiction of the CPUC and other LRAs by developing prescriptive

requirements for the counting of resources. Any minimum or maximum constraints on the counting of resources, as well as the actual counting rules, should be addressed by the CPUC and other LRAs;

- Is not sufficiently supported by data and analysis. The CAISO analysis does not appear to recognize flexibility from non-flex RA resources;
- Is not supported by actual operational examples of insufficient flexible capacity;
- Creates unnecessary complexity; and
- Does not allow for sufficient time for vetting and validation by stakeholders.

Several of these concerns warrant further discussion.

First, the 17-hour energy requirement for Category 1 is inconsistent with the CPUC's June 2013 RA decision. In fact, the requirement to be available to provide 17-hours of energy makes Category 1 capacity look much more like generic RA rather than the flexible RA needed to meet ramping events. In 2013 the CAISO and CPUC jointly defined the flexibility requirement as the maximum monthly 3-hour ramp. Based on this agreed-upon definition, a resource that provided six hours of energy should be able to count against the requirement without any restrictions. If the CAISO wants to redefine the definition of the requirement, then it should do so in concert with the CPUC and stakeholders and not through restrictions in the counting rules. Other aspects of the CAISO's proposal also appear inconsistent with the CPUC's most recent RA proposal.[6]

[6] The CAISO's proposed counting conventions for storage and demand response resources are inconsistent with the CPUC's most recent proposal. The Energy Division proposal recommends qualifying capacity (QC) and effective flexible capacity (EFC) be determined using different methodologies for each resource type. For storage, the same QC methodology applied to dispatchable generic resources will be applied, based on a four-hour Pmax (maximum sustained output), including testing and verification in CAISO operations. For supply-side DR, the same requirements currently applied to customer-focused, existing demand response programs and rates will be applied (using load impact protocols). See Qualifying Capacity and Effective Flexible Capacity Calculation Methodologies for Energy Storage and Supply-Side Demand Response Resources, Staff Proposal Outline, Resource Adequacy Proceeding R. 11-10-023, January 16, 2013. http://www.cpuc.ca.gov/NR/rdonlyres/59531E27-5A74-4E47-8551-0FBAB2DB6B0D/0/QCandEFCMethodologies_ESandSupplySideDR.PDF

Second, the analysis provided by the CAISO is insufficient to justify the adoption of such a complex framework. The CAISO has not analyzed the energy needed during daily ramping events or factored into its analysis the flexibility that can be expected from resources not included in the flexible RA showing. PG&E recommends the CAISO calculate the daily flexibility energy needed for 2013. This requirement can then be compared against the energy expected from different category frameworks, including the CAISO's proposed framework and an alternative recommended by PG&E. PG&E also recommends the CAISO adjust the requirement to recognize some of the flexibility that could be provided by non-RA resources. These resources will be providing flexibility in part due to the price signals in the CAISO's spot markets.

Third, the category proposal is unnecessarily complex. This includes the need for four categories with different counting and bidding requirements, as well as, the procurement limits for each of the categories that change monthly. These changing targets will make the buying and selling of RA and compliance reporting more difficult. It seems the CAISO has lost sight of the scale of the problem to be solved.

The introduction of such complexity is especially curious given the new Reliability Services Initiative (RSI) introduced by the CAISO on January 28th. In this initiative, the CAISO will seek to standardize eligibility criteria and MOO for all RA (system, local and flexible). If the CAISO wants to standardize RA, it is counterproductive to introduce four new RA products via the categories. The most recent FRAC-MOO proposal is headed in the wrong direction. Moreover, since the RSI will be revising all RA in this new initiative, it makes more sense to make incremental, less complex changes in FRAC-MOO now, analyze the results of these changes in 2014 and 2015, and refine the RA rules in the RSI.

An incremental, go-slow approach also makes sense since the CAISO has not yet factored the

impact of the new Energy Imbalance Market (EIM). The CAISO expects the EIM to reduce flexibility reserve cost in the CAISO by $3-55 million annually by decreasing the requirement.[7] The introduction of the EIM may also impact the rules that are needed to count and bid flexible RA. The CAISO should wait to implement such a complex framework until we better understand the impact of the EIM on the CAISO. Further, the adoption of 15-minute scheduling under FERC 764 is also likely to have an impact on the spot market's ability to accommodate output from wind and solar resources.

ISO Response

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed "unlimited" and "limited flexibility" categories into a single category, named "base flexibility" and would allow use-limited resources to provide base flexibility.

The ISO has combined the previous "unlimited" and "limited" categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs, which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details.

[7] PacifiCorp-ISO Energy Imbalance Market Benefits, page 35. http://www.caiso.com/Documents/PacifiCorp-ISOEnergyImbalanceMarketBenefits.pdf

2. PG&E Proposes a Simplified Category Framework

PG&E recommends the CAISO simplify its four-category framework to two categories or types. Categories 1 and 2 would be combined into Type 1, and Categories 3 and 4 into Type 2. There is no limit to the amount of Type 1 resources that can be shown by a load serving entity (LSE) towards its flexible RA requirement. Type 1 would have a six hour energy requirement which is consistent with the framework adopted by CPUC. Up to ten percent of an LSE's requirement can be shown from Type 2 resources. This ten percent limit is fixed for all months.

The two categories are not defined by technology. Requirements for Type 2 resources are less restrictive, but any resource can participate as either a Type 1 or Type 2 resource. Additional detail of the two types is provided below.

Type 1 (no limit for showing)

- 17-hour bidding requirement (5:00 a.m. to 10:00 p.m., every day).
- 6 hours of energy limit (based on a resource's committed, or shown, effective flexible capacity (EFC)).
- Minimum two starts each day.
- Scheduling coordinators indicate to the CAISO if the 6-hour energy limit (or higher), a maximum daily start limit (minimum two), or no restrictions are applicable for each day.
- Regulation energy management (REM) resources are classified as Type 1. Due to the nature of only providing 15 minutes of energy for a 3-hour flexibility definition, the EFC for a REM resource will be counted as one-twelfth (1/12) of its nameplate capacity. The CAISO has full control of committed REM resources.

Type 2 (up to 10 percent of showing)

- 5-hour bidding requirement (Monday - Friday with applicable hours seasonally determined by the CAISO during the annual Flexible Capacity Requirements (FCR) study process).
- 3 hours of energy limit (based on a resources' committed, or shown, EFC)
- Minimum ten starts per month.

- Scheduling coordinators indicate to the CAISO if the 3-hour energy limit (or higher), a maximum daily start limit, or no restrictions are applicable for each day.

2015 will be a test year. If the CAISO experiences an operational problem related to flexibility in its spot markets, it can issue a capacity procurement mechanism (CPM) designation to address the issue. If it is determined that specific restrictions on use-limited resources counting for flexible capacity RA are necessary to address CAISO operational challenges, the CAISO and CPUC could work with stakeholders to develop a refined approach for future years (2016 and beyond). In the absence of operational evidence that an alternative method is needed, this proposed approach would continue to be used.

Over the next several years through the RSI and other forums, the CAISO, CPUC, and stakeholders would continue to evaluate whether additional categories or other modifications to the flexible capacity framework are necessary. In the initial RSI paper, the CAISO has indicated a preference for standardization of RA products which supports fewer not more categories. Future analysis should consider:

- Commitment of use-limited resources as flexible capacity and their impact on operations;
- The ability for market prices to incent non-RA resources to provide flexibility;
- Historic operational performance of the grid with regards to flexibility; and
- Number of CPM events required to procure additional flexible RA and identification of cause for those incidents.

ISO Response

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed “unlimited” and “limited flexibility” categories into a single category, named “base flexibility” and would allow use-limited resources to provide base flexibility.

The ISO has combined the previous “unlimited” and “limited” categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs,

which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details.

3. PG&E Does Not Support Using CPM to Backstop Flexible Capacity with the Four Category Framework

PG&E does not support the CAISO's plan to extend the tariff applicability of the CPM to include insufficient flexible capacity. We do not support the CPM expansion because of our opposition to the categories as discussed above. Backstopping the four categories as currently proposed would unnecessarily increase CPM cost for California customers. PG&E would support expanding the usage of CPM as a flexibility capacity backstop should the CAISO redefine its categories in a manner consistent with PG&E's recommended two-type approach discussed above

ISO Response

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed "unlimited" and "limited flexibility" categories into a single category, named "base flexibility" and would allow use-limited resources to provide base flexibility.

4. PG&E Continues to Support Two Changes to the Flexibility Requirement Allocation Methodology

As discussed in our Nov. 27, 2014 comments, PG&E continues to support two changes to the methodology used to allocate the flexibility requirement.

1. The flexibility requirement caused by VERs' output should be allocated to VERs; and
2. The allocation to load should be done based on each LSE's largest monthly ramp, regardless of coincidence to net-load peak ramp.

Flexibility Requirement Caused by VERs' Output Should Be Allocated to VERs

PG&E supports allocating the flexibility requirement caused by VERs to VERs. An allocation to VERs is fair, helps create efficient procurement outcomes and does not put at risk grid reliability. As discussed in PG&E's previous comments, allocation of the flexibility requirement of merchant VERS or VERs with non-CAISO off-takers to CAISO participants is unjust and unreasonable. Other control areas, such Puget Sound Energy (Puget)[8] and Westar Energy,[9] have recognized the need to fairly allocate the fixed capacity costs associated with regulation services. Puget developed FERC-approved regulation services charges for generators that include the capacity cost of resources needed to balance intermittent generation. These costs are allocated by Puget to generators that export their power or serve the energy needs inside the control area. The CAISO should take a similar approach in allocating flexibility requirements to generators that export their energy or serve CAISO load.

The allocation of the flexibility requirement to VERS will also promote efficient procurement outcomes. If the true cost of VERs is allocated to VERs, then these costs will be reflected in their offers to energy and capacity solicitations. This means that the true costs will be reflected in the offers, and the procurement will be based on a more accurate cost basis resulting in better procurement decisions. Moreover, having these costs correctly accounted is also fairer to competing resource technologies that have lower or little flexibility requirement costs. Allocation of the flexibility requirement to VERs will not put at risk grid reliability. One possible solution suggested at the stakeholder meeting to eliminate the possibility of CAISO load

[8] Puget Sound Energy's Compliance Filing Regarding Revisions to Settlement and Submission of Schedules 3 and 13 of Puget Sound Energy, Inc.'s Open Access Transmission Tariff, Feb. 6, 2013. http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13173234

[9] Westar Balancing Area Services Agreement and Schedule 3A to Open Access Transmission Tariff, June 3, 2009. http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12041334

procuring flexibility on behalf of non-CAISO load was for the CAISO to remove the generation and variability produced by VERs from non-CAISO off-takers from the requirement calculation. This approach is fundamentally flawed. Either the CAISO needs the flexibility to meet the intermittent burden placed on the system or it does not. The requirement does not disappear simply because there is a non-CAISO off-taker (assuming the generator is not dynamically metered). If the requirement is needed for reliable grid operations, then the flexibility should be procured and the costs allocated to the responsible VER. Artificially reducing the requirement puts the CAISO's reliability at risk.

Finally, the issue of grandfathering for VERs is irrelevant. This is a new requirement for both load and generators to better reflect the changing energy market. The CAISO is not seeking to eliminate an established CAISO settlement calculation. The fair allocation of this new requirement to all participants (load and generation) needs to be considered. This is similar to the approach taken in the FERC settlement for the Flexible Ramping Constraint cost. Like the flexible capacity requirement, this was a new cost. The issue of cost allocation among load and generation was considered in the settlement, and generators are allocated that portion of the cost that was determined attributable to them (25%).[10] Similar to the Flexible Ramping Constraint, a portion of the flexibility requirement should be allocated to the generators causing the requirement.

Allocation to Load Should Be Done Based on Each LSE's Largest Monthly Ramp, Regardless of Coincidence to Net-Load Peak Ramp

PG&E maintains that the non-coincident approach for the allocation due to load is preferable to the CAISO's allocation based on ramps coincident to the system net load ramp. The CAISO's coincident peak approach can result in one LSE benefiting from the flexible capacity procured by another LSE and not sufficiently contributing to the procurement of flexible capacity. As shown in the simple example in our previous comments, a fairness issue exists with the coincident approach. A non-coincident approach addresses this flaw.

[10] CAISO Fifth Replacement Tariff, Section 11.25.3.
http://www.caiso.com/Documents/Section11_CaliforniaISOSettlements-Billing_Nov1_2013.pdf

PG&E believes that entities benefitting from procured flexibility should be required to pay a portion of the procurement costs, just as entities benefitting from the investment of transmission are required to pay for a portion of the costs of that transmission.[11] This is the key underlying argument of PG&E's proposed allocation methodology – that all entities will utilize and benefit from procured flexible capacity, regardless of their contribution to the coincident system net load ramp.

ISO Response

Allocating an RA requirement to generating resource is a significant change to the current RA construct. While the ISO believes that the PG&E proposal likely merits additional consideration, such changes to the RA construct is beyond the scope of the current stakeholder initiative.

As explained in the previous revised straw proposals the ISO believes that the flexible capacity requirement has been defined based on the maximum three-hour net-load ramp. As such it is most appropriate to reasonably allocate to the LRAs based on their jurisdictional LSEs' contribution to the maximum three-hour net-load ramps, not an individual LRA's peak. Additionally, as further explained in the previous revised straw proposals, allocating to LRAs based on their individual peak may not provide incentive for LRAs to reduce during peak three-hour net load ramps, when the flexibility need is greatest.

Finally, given the ISO's proposed flexible capacity offer-obligation categories, the ISO conducted a preliminary analysis to determine if additional granularity was required to account for LRAs' contributions to each category. In short, the ISO looked at LRAs' contributions to each of the identified categories to determine if a more complicated approach to allocating flexible capacity needs would be more consistent with causation principles. Based on the ISO's preliminary assessment there does not appear to be a significant difference between the proposed methodology and a methodology that examines a specific LSE's contribution to a

[11] FERC Transmission Planning and Cost Allocation by Transmission Owning Utilities, Notice of Proposed Rulemaking, Issued June 17, 2010, Docket RM10-23-000, p79-80. http://www.ferc.gov/whats-new/comm-meet/2010/061710/E-9.pdf

particular category. As such, the ISO believes that its proposed allocation methodology is consistent with the causation principles and avoids unnecessary complexity.

5. PG&E Supports Addressing the Flexible RA Incentive Mechanism and Replacement Rules in the New Reliability Services Initiative

PG&E supports addressing the Flexible RA incentive mechanism and replacement rules in the new RSI. PG&E cautions the CAISO to be realistic with the RSI Phase 1 time table. Inclusion of these items along with the other items in the Phase 1 scope (standardization of RA and creation of a new CPM) could easily take longer than the CAISO has projected.

ISO Response

The ISO appreciates the support for this aspect of the proposal.

6. Additional Coordination between the CAISO and CPUC on Flexible RA Issues Is Required

The current FRAC-MOO proposal includes counting rules for demand response and energy storage resources that diverge from counting rules proposed by the CPUC.[12] PG&E expects the CPUC's counting rules to set precedence and encourages the CAISO to coordinate with the CPUC so that the tariff filed with FERC in the spring conforms with the rules being developed in the current CPUC RA proceeding.

ISO Response

The ISO continues to work with the CPUC and other LRAs to align any flexible capacity procurement, counting provisions, and timelines to the greatest extent possible.

[12] Qualifying Capacity and Effective Flexible Capacity Calculation Methodologies for Energy Storage and Supply-Side Demand Response Resources, Staff Proposed Outline, Resource Adequacy Proceeding R.11-10-023; California Public Utilities Commission – Energy Division.

7. More Detail Is Needed on the Allocation of the Requirement
The CAISO's proposal to allocate the requirement due to variability in wind, solar PV and solar thermal on forecasted data requires additional detail. It is unclear if the CAISO intends to use historical weather data (to date, the CAISO has relied on a 2005 weather data set) or if CREZ data will be relied upon. These issues should be explained in detail in the next FRAC-MOO proposal and must be consistent with the approach taken in the FCR Technical Study.
ISO Response
The ISO will address the specifics regarding the inputs and assumptions for the flexible capacity requirements assessment in the stakeholder process associated with that study.

Company	Date	Submitted By

Powerex Corp.	2/3/2014	Thomas Elgie Tom.Elgie@powerex.com (604) 891-6010

Opening Comments

Powerex appreciates this opportunity to provide comment on the Fifth Revised Straw Proposal (the "Proposal") on the CAISO's Flexible Resource Adequacy Criteria and Must-Offer Obligation ("FRACMOO"). Powerex will focus its comments on three primary points. First, the CAISO should revise its proposal to permit resources at the interties to provide flexible resource adequacy supply. Second, consistent with cost causation principles, CAISO should not dictate that all costs of procuring such resources be assigned to LSEs. Third, CAISO should take steps to avoid free ridership concerns.

ISO Response

Each of these issues is addressed in greater detail below.

Resources at the Interties Should be Eligible to Provide Flexible Resource Adequacy

Powerex requests that CAISO reconsider the requirement in the Proposal that "[f]lexible capacity must be able to respond five-minute dispatch instructions" and its associated determination that "intertie resources and imports that are not pseudo-tied or dynamically scheduled into the ISO are not eligible to provide flexible capacity at this time."[1] Although CAISO has committed that it "will continue to assess the ability of imports to provide flexible capacity once we have had experience with 15 minute intertie schedules and individual flexible capacity products that allow for separation of the ISO's ramping and load-following needs", there is no reason to preclude the participation of intertie resources as sources of flexible resource adequacy by imposing the five minute restriction at the current time.

There simply has been no demonstration that only five minute dispatchable resources can meet CAISO's flexible resource adequacy needs. Such justification is lacking and cannot be provided because the five minute dispatch criteria is an artificial restriction that has no sound operational basis. The CAISO proposal considers the maximum **3-hour** net-load ramp of load serving entities,[2] measured during the "top five daily maximum **three-hour** net-load ramps within a given month."[3] Additionally, each of the Categories of product proposed by CAISO (Category 1

(Unlimited Flexibility), Category 2 (Limited Flexibility), Category 3 (Peak Flexibility), and Category 4 (Super-Peak Flexibility)) is measured in terms of the **three hour** net-load ramp.[4] Resources that can respond to fifteen minute instructions can just as effectively provide a product that is measured in three hour blocks of time as those that can respond to five minute instructions. While Powerex understands that CAISO requires that a portion of its overall ramping requirements throughout the day must be 5-minute dispatchable, just as a portion must be regulating reserves that are dispatchable within, and for durations of, mere seconds, it appears undeniable that a large portion of the CAISO's ramping needs can be reliably and efficiently met with 15-minute dispatchable resources.

CAISO curiously would permit resources that can be dispatched as infrequently as five times a month to provide flexible ramping service at the same time that it would preclude flexible resources at the interties with far greater availability. From an economic perspective, CAISO's intention to attempt to exclude a sizeable source of potential ramping supplies at the interties will lead to the inefficient over-procurement of other ramping supplies, at considerable cost to LSEs that could have been avoided and at the ultimate expense of ratepayers. The CAISO grid is not an island and for the CAISO to treat itself like one is detrimental to its own interest and the interest of its users. It is interconnected with adjacent regions that have provided valuable electric service to California for decades, including ramping capability. CAISO's decision suddenly to preclude those resources from providing a service that they are well-positioned to provide to the state is arbitrary and discriminatory, inefficient and inappropriate.

CAISO can and should avoid having its proposal subject to discrimination challenges because it precludes out-of-state supplies at the interties from providing a service that can provide service of equal or greater value to CAISO in terms of meeting its defined ramping needs. Removing an artificial barrier to participation by resources that are fully able to meet California's ramping needs will avoid the specter of such legal challenges, improve liquidity, buttress reliability and permit a lower cost solution to be captured by CAISO's load serving entities. Moreover, the alternative of having CAISO inevitably "lean" on the interties for ramping service in its operational markets, but not allow the suppliers of that service to receive compensation in its longer term ramping procurement capacity markets, is, in Powerex's view, unjust, unreasonable

and unduly discriminatory.

CAISO may also put itself in a precarious situation from an operational standpoint to the extent it assumes that resources that are ineligible to contract to provide a service will nonetheless be there when needed. With the ramping needs becoming more and more coincident between the Pacific Northwest and California, CAISO puts itself on a perilous precipice if it believes it can continue to expect and rely on intertie resources to provide ramping capability on a going forward basis, without providing the necessary incentives and commitment framework, as afforded to internal resources under the FRACMOO initiative.

In light of the plethora of reasons that intertie resources should be permitted to provide flexible resource adequacy and the dearth of reasons they should not be so permitted, CAISO should add a "Category 5 (Intertie Resources)" to the four categories it has set forth in the proposal.[5]

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1 Proposal at 32.

2 Id at 10.

3 Id. at 6.

4 Id. at 28.

5 Id.

ISO Response

The ISO must also address load following needs, however, at this time, the flexible capacity product contemplated here will simultaneously address 3-hour net-load ramps and load-following needs. In order to assure both are met, the ISO must require 5-minute dispatchability from flexible capacity resources. However, once these needs are split into separate needs, the ISO may be able to rely on intertie resources to address longer ramps while specified internal resources are available for meeting load following needs.

The CAISO Should Not Dictate that Costs of Required Ramp Should be Borne by LSEs

CAISO's proposal to impose the costs of required ramp on LSEs is fraught with unintended harmful consequences and is inconsistent with well-established cost causation principles.

As an example of an unintended and harmful consequence, entities outside of the CAISO footprint would be encouraged by this proposal to build variable energy resources inside the CAISO footprint, since the ramping needs of such units will be funded by CAISO LSEs. These entities will receive a free subsidy to the detriment of the LSE ratepayers.

Because all resources that precipitate the need for ramping service are not contracted to LSEs, LSEs should not exclusively bear the cost of such resources consistent with cost causation principles. Doing so would violate many of CAISO's seven elements that are to guide its cost allocation decisions, including: 1) causation, 2) comparable treatment, 3) accurate price signals, 4) incentivize behavior, 5) manageable, 6) synchronized, and 7) rational.

Generating resources may or may not be contracted to LSEs. Those contracted to third parties clearly should not have their flexible resource adequacy costs funded by LSEs. Doing so shifts costs from those that caused the incurrence of the costs to the LSEs inappropriately, creating a class of free riders. This discriminates against LSEs, is economically inefficient, is inconsistent with cost causation principles and fails to incentivize appropriate behavior, among other problems. This is equally true of those resources that are contracted to LSEs, but where the commercial terms between the parties dictate that the resource, not the LSE, bears costs such as ramping and/or integration services.
Powerex reiterates its previous recommendation that the ISO allocate costs at a scheduling coordinator level based on each scheduling coordinator's aggregate ramping needs, including generation and load contributions. Powerex further recommends that the ISO provide a framework for the assignment of this ramping requirement from one SC to another, based on mutual agreement.

ISO Response

In response to Powerex's question regarding the causation principles that are reflected in the ISO proposed allocation of changes in load, the ISO believes that this allocation mechanism is consistent with each cost allocation principle. Causation – Each LRA's jurisdictional LSEs' changes in load are a significant component to the 3-hour net-load ramps. It is reasonable to

allocate flexible capacity requirements to these net load changes as they cause the need. Using last year's load data provides reasonable estimate for proportionate contribution of each LRA for the next year. Comparable treatment – All LRA's are allocated the proportion of the net load change using the same process. Accurate price signals and incentivize behavior – The ISO's greatest flexible capacity needs are defined as the need to address the largest 3-hour net load ramps. In the future, this will likely change as downward ramps and load following constraints begin to bind more frequently. However, for now, allocation based on the contribution to LRA based on proportionate load changes over three hours sends the proper signal and incentive to LRAs to encourage their jurisdictional LSEs to mitigate their load changes over these peak net load ramping events. Manageable – The ISO's proposed allocation method is a much more manageable methodology than the one proposed by PG&E. Synchronized – The allocation methodology is synchronized to the identified 3-hour net-load need. As noted above, as downward ramps and load following constraints begin to bind more frequently, there will likely be a need to expand the definition of this need. At that time, the ISO would reassess how well this allocation methodology remains synchronized to the identified and defined need. Rational – At this time, the flexible capacity discussed here has been defined in quantity to meet the maximum three-hour net-load ramp with sufficient resources with 5-minute real time dispatch capability. It is not rational to allocate contributions to load based on ramps that do not fall within the ramps that do not fall within the largest three hour net-load ramping needs.

The ISO is not allocating costs, but flexible capacity requirements to LSE's that have contracted with intermittent resources. The flexible capacity requirements assessment covers only internal ISO load, and does not address imports or exports. The ISO understands Powerex's assertion that all flexible capacity costs should be allocated direct to the SC of a VER resource. However, allocating an RA requirement to generating resource is a significant change to the current RA construct. While the ISO believes that proposal such as PG&E's and those implied here by Powerex, likely merit additional consideration, such changes to the RA construct are beyond the scope of the current stakeholder initiative. The ISO will assess the proper manner for merchant VERs as part of the flexible capacity requirements assessment.

The CAISO's method for determining each LSE's contribution to the system's ramping

needs violates cost causation principles and enables free-riding
Powerex also disagrees with CAISO that it is equitable to allocate monthly flexible capacity procurement requirements based upon jurisdictional LSEs' contribution to the 3- hour net-load ramp. As PG&E properly has indicated, the monthly averaging of the maximum peak ramps and the use of coincident peak ramps that CAISO has proposed are inappropriate. PG&E asserts that ISO will procure system flexibility to meet the expected peak ramp, not the average ramp, and the use of an average unfairly would charge an LSE with stable load ramp more than one with the same maximum ramp but a lower average ramp. As to the use of the coincident peak (CP) versus the non-coincident peak, PG&E asserts that use of the CP results in a free ridership problem and is inconsistent with cost causation principles. Even though one LSE has substantial ramp, if it is not coincident with the peak ramp, the CP method leads to allocating the entirety of the flexibility requirement to one LSE and none to the other. CAISO itself has conceded in the proposal that "the ISO's greatest demand for flexible capacity may not be during the times of peak demand."6 Accordingly, CAISO should adopt the PG&E proposal, with one modification. That is, any LSE that has a positive impact on the worse coincident peak ramp for the CAISO grid should have its own worse ramp offset by the amount of its positive impact during this coincident peak ramp and charges assessed reflecting such credit. Given CAISO's concession that its demands may be greatest during non-coincident peak times, Powerex strongly opposes the CAISO's approach. It is simply inappropriate to allow entities that have large ramps in periods outside of the coincidental peak to be free riders.
ISO Response
The use of the top five net load ramps in a month should mitigate the impact of anomalous net-load ramps for any single LRA. As stated in previous revised straw proposals, the ISO believes that free-rider problem asserted by PG&E is not, in fact, resolved by their proposal, but instead the LRA that contributes significantly during peak 3-hour net-load ramping events will be allowed a free-ride during the time of greatest need under the PG&E proposal.

CAISO Should Alter Its Proposal to Eliminate Free Ridership Concerns
In addition to the free ridership concerns relating to the use of the CP billing determinant discussed above, and the similar “leaning” on the interties free ridership concern, a third free ridership concern exists. That is that the CAISO has designed its proposal as if California is an island also from the perspective of consumption of ramping capabilities. It has not placed protective measures in place to preclude the flexible resource adequacy product from being consumed at the interties, either via a decrease in imports or increases in exports, nor has it otherwise taken steps to preclude a shortfall in the resource adequacy product resulting from such activities. Such provisions have been included in the Tariffs of eastern ISOs and should be adopted by CAISO as well.
ISO Response
It needs to be recognized that by enforcing the flexible ramping constraint in the process RTPD run that schedules interchange, however, the CAISO is enforcing a ramp constraint, and a much more sophisticated ramp constraint than those enforced by the eastern ISOs because the CAISO flexible ramping constraint will take account of the ramp needs of the internal system, so would schedule more ramp for exports if that helped the internal ramp, i.e. if internal net load were falling, and schedule more ramp for imports if that helped internal ramp, ie if internal net load were rising. In the end state, with the flexible ramping product in place, the CAISO will be scheduling imports and exports and will not schedule exports that reduce ramp capability, or will charge a price reflecting the impact of the exports on ramp capability. That is, a price taking export bid could cause the CAISO to go short on ramp capability but the price paid for the export would reflect the penalty price for the foregone ramp capability. Nevertheless, the CAISO could at times be ramping in exports at the same time that the wind dies, creating more extreme ramps for internal generation. This, however, is a problem of imperfect forecasting. This outcome would not be avoided by any kind of ramp scheduling process as the ramp scheduling process would not know that the wind was going to die in 20 minutes either.

Company	Date	Submitted By
San Diego Gas & Electric Company	1/31/14	Nuo Tang / Randy Nicholson

Opening Comments

SDG&E continues to support the Category concept for Flexible Resources. SDG&E makes the following recommendations in hopes to have greater clarification in the ISO's 6th revised draft final proposal.

ISO Response

No response required.

1. SDG&E appreciates the ISO proposing technology agnostic must offer categories.

However, it is not clear how the proposed Categories and must offer obligations address discrete needs within the ramp duration curve. SDG&E recommends the ISO provide increased r clarity on how each Category's MOO fits the ISO's need to meet the net ramps in the 17 hours. Examples of how the Categories' bids may be awarded to meet both the Peak as well as the Net Ramps over several days or month should provide better context.

ISO Response

The ISO has provided additional clarifications to the minimum availability requirements and must offer obligations in sections 5.4 and 5.5 of the draft final proposal.

2. It is unclear if the different ramping need throughout the month or day is the correct mechanism to determine the minimum and maximum percentage for the proposed Categories.

SDG&E suggests a statistical calculation based on the distribution of the ramps may prove more accurate than a raw calculation of the ramping needs throughout the month.

ISO Response

The ISO has conducted numerous assessments of ramping needs, including statistical assessments of the distribution of ramps. Given the definition of the requirement is set based on three-hour net-load ramping needs, the ISO has defined the breakdown using a similar measure.

3. SDG&E recommends the ISO expressly clarify that all types of supply, regardless of technology, can be sold or committed in any of the Categories provided it can meet that Category's specific MOO.

If a resource can meet the MOO of a Category, then it should be compensated as such. SDG&E believes the next iteration should clarify that resources can migrate between different categories during the year if it meets the underlying eligibly criteria of that Category and assumes the obligations and risks associated with that Category. As an example, SDG&E would like the ISO to confirm that a 100MW resource sold as 40MW Category 1, 30MW Category 2, 20MW Category 3, and 10MW Category 4 has two distinct MOOs (70MW for 17hours and 30MW for 5 hours which overlaps the 17 hours per day). The maximum energy needed for each MW tranche is different (17 hours for category 1, 6 hours for 2, 3 hours for 3 daily and 3 hours for 5 days a month for 4).

ISO Response

This clarification has been made on page 33 of the draft final proposal.

4. The ISO is currently proposing that the min and max limits for Categories 1 through 3 would fluctuate based on the forecasted monthly ramping needs

SDG&E believes this approach could significantly complicate procurement and portfolio management issues for LSEs, and is inappropriate for what has always been described as an interim framework. SDG&E would like the ISO to consider and discuss the benefits or disadvantages of having only one percentage per Category for each month of the year. The ISO could use the minimum or maximum or monthly average of each category.

ISO Response

The ISO considered fixed percentages for each month. However, even with fixed percentages, the actual flexible MW quantity will change from month to month. Therefore, the ISO does not believe there is any benefit gained by fixing the percent contribution to each category for the year.

5. SDG&E supports the ISO's proposal effectively unbundling the flex and generic RA attributes by requiring two separate RA showings for flexible and generic capacity, and only attaching the relevant MOO for each attribute.

However, absent similar revisions to the RA framework, the result will be conflicting sets of rules on how LSEs and SCs must submit showings at the CPUC and CAISO, causing procedural as well as financial impacts. To prevent this outcome, SDG&E recommends the ISO also support corresponding revisions to the RA framework to facilitate unbundling.

ISO Response

The ISO appreciates the support for this aspect of the proposal.

Company	Date	Submitted By
Sierra Club	1/31/2014	Matthew Vespa Senior Attorney matt.vespa@sierraclub.org or at 415-977-5753

Opening Comments

Sierra Club submits the following comments on the Fifth Revised Straw Proposal ("Straw Proposal") for the Flexible Resource Adequacy Criteria and Must-Offer Obligation ("FRACMOO").

ISO Response

No response required.

Category 1 (a 17-Hour Obligation to Operate Continuously) Is Not Justified and Should Be Removed From the Proposal

In comments on the December Working Group Meeting, Sierra Club expressed concerns that a proposed 24-hour must offer obligation ("MOO") was excessive and without technical justification. Although a 24-hour MOO has been removed from the Fifth Revised Straw Proposal, these same concerns extend to a 17-hour MOO that requires continuous operation throughout a 17-hour period.

Development of a MOO should be guided by the reliability concerns vetted and acknowledged in the CPUC Resource Adequacy proceeding. In Resource Adequacy workshops on flexible capacity last year, CAISO presented analysis that purported to demonstrate that, as the sun sets and solar productivity declines, there was an increasing risk that sufficient flexible capacity would not be operationally available to meet ramping needs in shoulder months. According to CAISO, this late evening ramp justified a MOO to ensure flexible resources would be available to meet this highly predictable ramping need. While smaller ramps occur throughout the day, there was no showing that existing market mechanisms – which already operate to meet changes in load – are inadequate to continue to address these significantly more shallow secondary ramps. Therefore, a 17-hour MOO that requires continuous operation does not appear necessary to meet legitimate reliability concerns. To the extent there is a reliability concern with meeting secondary ramps, CAISO has not explained why Category 2, which requires a 17-hour MOO with two potential ramps but without the continuous operation requirement, could not effectively address this need.

Category 1 is of particular concern because it sets a minimum procurement requirement that can only be met with gas-fired generation. Because Category 1 is not needed to address legitimate reliability concerns resulting from increased renewable penetration, the Straw Proposal functions to needlessly cement the role of carbon-polluting resources in California's energy future and undermines achievement of state decarbonization objectives. Indeed, the Straw Proposal turns the Loading Order on its head by requiring that a minimum (and potentially all) of flexibility needs are filled with gas generation without first considering the role of preferred resources in meeting system flexibility needs. Accordingly, Category 1 should be removed from the Straw Proposal.

ISO Response

Sierra Club's comments seem to reveal a more fundamental misunderstanding of the ISO proposal, specifically, and the ISO's markets, generally. For example, Sierra Club conflates the ability to run for 17 hours (which is what the ISO had originally intended) with a requirement to operate for 17 hours (which is how Sierra Club appears to have interpreted the proposal). The ISO's has not proposed and would never propose to require resources to run for 17 hours unless determined by the day-ahead and real-time markets.

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed "unlimited" and "limited flexibility" categories into a single category, named "base flexibility" and would allow use-limited resources to provide base flexibility.

The ISO has combined the previous "unlimited" and "limited" categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs, which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details.

The MOO for Category 2 Needs Additional Clarification

Category 2 requires a resource to submit economic bids from 5 a.m. through 10 p.m. and allows for participation by use-limited resources that have the ability to start at least twice a day and provide energy for at least six hours. Additional clarification on this obligation is needed. Is the six-hour energy obligation evenly divided into two three-hour periods or would a resource

potentially need to provide energy for 5 hours in one period and one hour the next? In addition, is there a minimum period between potential start times? Given that identified flexibility need is for one primary and one secondary three-hour ramp, one would expect the energy obligation would be for two three-hour periods with some degree of temporal separation. Additional clarification is needed prior to the next Straw Proposal to provide stakeholders with a better understanding of the ability of a use-limited resource to qualify for this category.

ISO Response

The proposed counting provisions do not assume anything about the level of load or output for any single resource. The dispatch of a resource is based on the ISO market optimization.

The Straw Proposal Should Account for the Ability of Energy Storage Charging to Meet Ramping Needs to Recognize the Full Value of this Resource and to Better Align with the Treatment of Energy Storage in the PUC's Current Resource Adequacy Proposal

The Straw Proposal does not appear to account for the charging ability of energy storage to help meet flexibility needs. This significant omission functions to discount the full value of storage as a flexible resource, may result in unneeded overprocurement of other types of resources and non-optimal outcomes, and is inconsistent with the PUC's proposed treatment of energy storage for resource adequacy purposes. The potential use of energy storage charging in meeting flexibility needs should be included in the next iteration of the Straw Proposal.

To the extent CAISO believes charging is accounted for through market dispatch optimization, this mechanism needs further explanation and elaboration in the subsequent Straw Proposal. It would be helpful for the CAISO to describe how storage resources such as pumped hydro and 3-hour battery storage could potentially be bid and dispatched under Category 2 and how its charging functionality is accounted for and credited. If barriers currently exist in the CAISO's market design to using charging as a mechanism to meet flexible capacity needs, these barriers must be identified and removed. This will facilitate the additional and optimal deployment of energy storage by capturing a potential revenue stream, reduce the overall system cost of meeting flexibility needs and help achieve the clean integration of renewable resources.

ISO Response

First, the ISO proposal treats the output of energy storage resources more consistently with conventional resources by allowing for a ramp rate rather than assuming a constant output across all hours. Second, it provides a clear first step for accounting for the flexible capacity benefits of energy storage resources. The charging cycle of storage may be able to provide flexibility, but the concept needs additional analysis. Further evaluation should be made of the timing of the peak and the trough of the net load, how they relate to the three-hour net load ramp, the characteristics of storage devices, and how they will be used be the ISO market optimization to reduce the net load ramp. For example, because of operational attributes, a resource might have to stop charging completely for some period of time before switching from charging to discharging. In this instance, it is not clear what flexibility benefits the energy storage resource has provided.

The ISO believes that this scenario, along with other potential operational issues as to whether different storage technologies are better suited to produce energy products or regulation services, can be resolved and provide an opportunity for many resources to provide flexible capacity benefits during the charging portion of the resource. However, it does point to the need to spend additional time addressing these matters. The ISO's proposed methodology would provide a clear starting point for measuring the flexible capacity of energy storage.

Bucket 4 Should Be Limited to Demand Response Resources

Sierra Club has previously expressed concerns that the Straw Proposal's shift to generic "technology agnostic" resource buckets creates significant risk that these buckets will be filled with carbon-intensive resources. As the PUC has repeatedly found with regard to long term procurement, LSEs "were deficient and spotty in regards to addressing filling their net short position with preferred resources from the EAP loading order and particularly inadequate in accounting for GHG emission reductions." 1 Moreover, while the Sierra Club believes the Loading Order applies to resource adequacy, others have argued the Loading Order address procurement of new resources only, not resource adequacy contracting. Given these uncertainties, removal of resource-specific MOOs will only function to dilute deployment of low-carbon resources.

With these concerns in mind, Bucket 4, which appears to be modeled after Limited DR products

in PJM Capacity Markets,2 should be explicitly available only to demand response resources. Specific demand response criteria are not "discriminatory" under FERC. Because the bucket does not require minimum participation and is subject to the same dispatch optimization as other resources, making Bucket 4 DR specific would not unduly discriminate against non-DR resources or raise reliability concerns. Even if it could be viewed as discriminatory, FERC may justify a disparate effect by "pointing to differences … that are relevant to the achievement of permissible policy goals." Black Oak Energy, LLC v. FERC, 725 F.3d 230, 239 (D.C. Cir. 2013). A separate bucket for demand response is more consistent with California's climate and energy goals, including the Loading Order, which requires utilities to: "invest first in energy efficiency and demand-side resources, followed by renewable resources, and only then in clean conventional electricity supply."3 Moreover, because PJM capacity markets already have these types of categories, there is no legitimate basis to conclude a DR specific MOO would not be approved by FERC. Limiting Bucket 4 to DR resources is consistent with California's clean energy policies and does not unduly impinge on use of other resources to meet flexible capacity needs.

1 D.07-12-052 at p. 3.

2 PJM, PJM Manual 18: PJM Capacity Market (Nov. 2013) at p. 65, http://www.pjm.com/~/media/documents/manuals/m18.ashx.

3 Energy Action Plan 2008 Update at p. 1).

ISO Response

The Sierra Club's comments seem to confuse the jurisdiction and function of the ISO and LRA. The ISO's shift to technology agnostic buckets was made to address the ISO flexible capacity needs. The ISO is the agency with best ability to determine these needs. The LRA still has the ability to determine what portfolio of resources their jurisdiction LSE's can or should procure. Therefore, while the ISO has set the levels of the categories, it is up to the CPUC to determine if procurement within a category should be dedicated to a specific resource technology as Sierra Club suggests. Further, while Sierra Club refers to the demand response options provided in PJM as precedent, the procurement structure in California is significantly different from that of PJM, limiting the strength of the comparison.

Company	Date	Submitted By
Silicon Valley Power	1/31/2014	Ken Kohtz

Opening Comments

The City of Santa Clara, doing business as Silicon Valley Power ("SVP"), appreciates the opportunity to submit comments in response to the California Independent System Operator ("CAISO") Flexible Resource Adequacy Criteria and Must-Offer Obligation Fifth Revised Straw Proposal. SVP, which operates in the CAISO as a Load Following Metered Subsystem, supports and adopts the comments submitted by Northern California Power Agency ("NCPA") and by the Bay Area Municipal Transmission Group ("BAMx") in response to CAISO's Fifth Revised Straw Proposal. SVP provides additional limited comments below.

ISO Response

No response required.

Comment 1

In the Fifth Revised Straw Proposal, the CAISO proposes to delay the development and pricing of the Standard Flexible Capacity Product to a later date. The CAISO further states that because there are no additional risks associated with replacement or substitution of flexible capacity, the CAISO will defer further development of this aspect the straw proposal as well, at least through the 2015 RA compliance year. Fifth Revised Straw Proposal at 6-7, 32, 35-36. SVP agrees with the CAISO's decision to defer this component of the proposal. SVP previously expressed concern that an entity with use-limited resources providing flexible capacity would be subject to penalties or replacement obligations if the must-offer results in the resource's use limitations being exceeded. SVP added that this element of the proposal could have unintended consequences by discouraging entities from making flexible capacity available because they might need the resource as a replacement. SVP agrees that further development of this issue is warranted and agrees with the CAISO's deferral of this issue.

The CAISO also concludes that there is not currently a clear basis to establish a price for the Standard Flexible Capacity Product. Fifth Revised Straw Proposal at 6, 35. The CAISO states that deferring this item would allow the pricing of this incentive mechanism to be informed by two other related policy initiatives: (1) the Reliability Services Auction, and (2) the Flexible Ramping Product. SVP agrees that further vetting of this issue is warranted and urges the CAISO to take the time that is needed in order to establish a just and reasonable price for this mechanism.

ISO Response

The ISO will take-up the deferred issues in the Reliability Services Initiatives.

Company	Date	Submitted By
Six Cities	1/31/14	Bonnie S. Blair Thompson Coburn LLP 1909 K Street N.W., Suite 600 Washington, D.C. 20006-1167 bblair@thompsoncoburn.com 202-585-6905

Opening Comments

In response to the ISO's request, the Cities of Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside, California (collectively, the "Six Cities") submit the following comments on the ISO's January 17, 2014 Fifth Revised Straw Proposal on Flexible Resource Adequacy Criteria and Must-Offer Obligation ("the 5th Revised Straw Proposal").

The Six Cities appreciate the ISO's on-going efforts to address stakeholder concerns as reflected in the 5th Revised Straw Proposal. In light of the complexities involved in developing rules for allocation of Flexible RA requirements and the operational characteristics of resources eligible to meet those requirements, the Cities specifically support the ISO's determination in the 5th Revised Straw Proposal to defer adoption of rules defining a Standard Flexible Capacity

Product, implementing opportunity cost bidding for use-limited resources, and establishing substitution requirements for Flexible RA resources.
The Six Cities have the following concerns and/or questions with regard to certain elements of the 5th Revised Straw Proposal:

ISO Response

The ISO will take-up the deferred issues in the Reliability Services Initiatives.

Comment 1

With regard to Category 1 Flexible RA resources the Cities do not see any justification for excluding use-limited resources that can meet the Category 1 must-offer requirements. Consistent with the ISO's objective of remaining technologically neutral, any resource that can satisfy the Category 1 must-offer requirements for a month should qualify to provide Flexible RA under Category 1 for that month. Stated differently, a use-limited resource that has a usage allowance for a month that would allow it to operate between 5:00 a.m. and 10:00 p.m. throughout the month should be eligible to supply Flexible RA capacity for the month

ISO Response

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed "unlimited" and "limited flexibility" categories into a single category, named "base flexibility" and would allow use-limited resources to provide base flexibility.

The ISO has combined the previous "unlimited" and "limited" categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs, which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility

category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details.

Comment 2

With regard to Category 2, the Six Cities urge the ISO to modify the eligibility criteria to allow use-limited resources with moderate monthly limitations on start-ups to qualify. Strictly interpreted, the proposed criteria for Category 2 resources appear to exclude peaking units with monthly start-up allowances of less than sixty starts (for months with thirty days) or sixty-two starts (for months with thirty-one days). It seems unlikely that operational needs would require dispatch of Category 2 resources twice a day every day during a month. Requiring the ability to start sixty times or more during a month would exclude many resources that otherwise could make available to the ISO valuable flexibility attributes, including the ability to start more than two times per day, if necessary, for resources that have a monthly limitation on start-ups but not a daily start-up limitation. In addition, some resources that are subject to start limitations may have the ability to provide energy for periods longer than six hours once they are started. In these circumstances, the expanded duration of energy availability may offset start-up limitations. The Cities request that the ISO modify the proposed start-up criteria for Category 2 (a) to allow eligibility for resources with monthly start-up allowances of thirty or more and daily start-up allowances of two or more, and (b) to allow eligibility for resources that can start up at least twenty times during a month and provide energy up to seventeen hours with each start-up. Providing this additional flexibility in the criteria for Category 2 resources will expand the pool of resources that can be made available to the ISO for Flexible RA capacity without significantly reducing the range of flexible attributes the ISO can utilize.

ISO Response

The ISO has added additional clarity to the draft final proposal regarding the minimum availability requirements and offer-obligations. The ISO further clarifies that “No monthly or

annual limitations on number of starts or energy limits that translate to less than the daily requirements" in reference to annual use limitation means that a resources can be shown for more months than its annual use-limitation would allow. For example, a resource with 200 starts per year could not be shown for more than three months in an annual RA showing (i.e. 100 days with 2 starts per day). Alternatively, a resources with 500 run hours per year could not be shown on more than two months (500 hours divided by 6 hours per day equals 83 days).

Comment 3

With regard to Category 2, the Cities request that the ISO clarify that satisfaction of the ISO's proposed six hour daily energy obligation will be measured on an aggregate basis, so that, for example, a Category 2 resource that provides three hours of energy in the morning ramp and three hours of energy in the evening ramp for a given day will have satisfied its availability obligation for the day.

ISO Response

Yes, a category 2 (the original category 2, now the base flexibility category) resource that provides three hours of energy in the morning ramp and three hours of energy in the evening ramp for a given day will have satisfied its availability obligation for the day. However, the offer obligation is to submit economic bids for 17 hours. The ISO's market will optimize the dispatch of the resources over the offer obligation window.

Comment 4

For resources in Categories 2, 3, and 4, the Cities request that the ISO clarify that once a resource has responded to dispatch instructions for the number of hours in a day required for that category (i.e., six hours for Category 2 as proposed by the ISO and three hours for Categories 3 and 4), the resource is not obligated to submit economic bids for the remainder of that day. Similarly, the ISO should clarify that once a Category 4 resource has been dispatched five times during a month, it is not obligated to submit economic bids for the remainder of that month.

ISO Response

Once a resource reaches any applicable use-limitations then the resource will not be required to submit economic bids for the remainder of the day.

Comment 5

With regard to the classification of resources under Categories 2, 3, and 4, the Cities request that the ISO clarify that a resource owner or entity that has contracted for the resource may self-select the category under which it will be classified so long as it meets the criteria for that category. For example, the owner or entitlement holder for a resource that can meet the criteria for Category 2 should be able to choose whether the resource is classified under Category 2, Category 3, or Category 4.

ISO Response

The SC for the LSE can select the category in which a resource is shown as long as the resource meets the category's criteria. For example, a resource that is capable of providing category 1 or 2 capacity could be shown in either or have some portion of the capacity in each depending on the LSE SC's flexible capacity showing.

Comment 6

In their December 9, 2013 comments on the ISO's November 25, 2013 presentation on Assessing the Flexible Capacity Requirements for 2015, the Six Cities explained that they do not have load data or data on VER generation at the level of granularity proposed by the ISO. The 5th Revised Straw Proposal does not respond to the data availability problem identified by the Cities. Because the ISO proposes to begin data collection and analysis imminently, prompt resolution of the data granularity problem is necessary.

ISO Response

While this issue is best resolved in the flexible capacity requirements assessment, the ISO believes that load data should be provided at a the most granular level maintained by an LSE.

Company	Date	Submitted By

Southern California Edison	1/31/14	Joe M[c]Cawley (626-302-3301)

Opening Comments

SCE submits the following comments on the CAISO's FRAC-MOO Initiative. These comments are based upon SCE's review of the CAISO's FRAC-MOO 5th Revised Proposal13 (Jan 17, 2014) and SCE's participation in the discussion during the Jan. 23 Workshop.

SCE generally supports the CAISO's current proposal and appreciates the CAISO's willingness to change the direction of key aspects of the CAISO's proposal.

ISO Response

The ISO appreciates the support for the proposal.

Must Offer Obligation

SCE supports the Category Must Offer Obligation (MOO) framework as far superior to the prior resource specific MOO framework because it:

1) reasonably aligns flexible resource availability with CAISO need,
2) appropriately limits dependence on use-limited flexible resources based on the degree of use limitation, and
3) is technology neutral and therefore non-discriminatory.

SCE believes that the CAISO's currently proposed method to calculate the minimum and/or maximum contribution of each category to meeting the identified monthly flexible need is acceptable for the interim period associated with this proposal, which SCE believes is thru planning period 2017.

ISO Response

The ISO appreciates the support for this aspect of the proposal.

[13] http://www.caiso.com/Documents/FifthRevisedStrawProposal-FlexibleRACriteriaMustOfferObligation.pdf

Allocation Methodology

SCE does not believe changing to the Category MOO framework necessarily changes or should change the methodology the CAISO uses to allocate monthly flexible capacity requirements to LRAs. Within the existing RA framework, "how much we need" and "how it gets used", while somewhat related, are largely separate questions where allocation is a concern of the former and MOO design is a concern of the latter. A properly designed allocation methodology should reflect an LSE's (or LRA's) contribution to the peak monthly flexible capacity need whereas the flexible capacity MOO - whether Category or resource specific - should ensure the flexible resources shown by LSEs to meet that monthly peak need are available throughout the month when needed.

SCE continues to be concerned that the CAISO's proposed allocation methodology does not properly reflect each LSE's contribution to monthly flexible capacity needs. Specifically, SCE continues to believe that the allocations produced by the CAISO's methodology, particularly in the summer months, are prone to data and modeling effects that are not reflective of true operating conditions or a resource group's actual impact on flexible capacity needs.[14]

While SCE appreciates the CAISO changing the proposed allocation methodology to now use the average of the top five three-hour ramp components rather than just the peak three-hour period components (for wind and solar), SCE believes that even these results continue to illustrate the benefits of at least smoothing out the anomalous allocation factors by averaging the allocation for the four summer months (June – Sept).

ISO Response

Going forward, the ISO will conduct on-going assessments to determine how well the categories function to provide the flexible capacity required to address the ISO's flexible capacity needs. At this time we expect that additional information will be available on system needs as well as new procurement policies developed by the CPUC and ISO related to the Joint

[14] SCE still has concerns over various aspects of the CAISO's proposal, including cost allocation solely to load.

Reliability Plan developed in 2013 which will provide the basis for potential changes to the proposed flexible capacity product definition. Given the significance of these changes, continued assessment is important to ensure that this addition to the RA construct procures sufficient flexible capacity to address the flexible capacity needs. Second, because the flexible capacity categories and required procurement are new, the on-going assessments will provide information about how well the designed categories are providing flexible capacity that meets the system's operational needs and may identify areas where adjustments or improvements could be made. For example, with actual experience under the three-categories, the ISO may determine that an additional flexible capacity category requiring more than six hours of energy is necessary or there may be opportunities to refine the categories to better accommodate opportunities for preferred resource participation

SFCP and CPM Pricing

SCE supports the CAISO's proposal to:

1) not include an explicit SFCP mechanism or modify CPM pricing (from what it otherwise would have been) for planning year 2015, and
2) to continue the stakeholder discussion of whether and what appropriate forward price and incentive pricing should be established for flexible capacity.

SCE understands that as part of this deferral the CPM tariff will change to include explicit authority for the CAISO to backstop procure for flexible capacity showing deficiencies.

ISO Response

The ISO appreciates the support for this aspect of the proposal.

Requests for clarification

Would the CAISO please clarify that it is the CAISO's intention to use the LRA's methodology to determine the LSE's respective flexible capacity requirement allocation as the basis for determining which if any LSE is deficient in an applicable showing and for determining how to allocate any applicable backstop procurement costs.

ISO Response
The ISO has attempted to clarify backstop procurement and cost allocation in section 7 of the draft final proposal.

Company	Date	Submitted By
The Utility Reform Network		Kevin Woodruff Principal, Woodruff Expert Services 1100 K Street, Suite 204 Sacramento, CA 95814 (916) 442-4877 kdw@woodruff-expert-services.com Thomas J. Long Legal Director The Utility Reform Network 115 Sansome Street, Suite 900 San Francisco, CA 94104 (415) 929-8876, ext. 303 tlong@turn.org
Opening Comments		
The Utility Reform Network (TURN) offers the following comments on the CAISO's Fifth Revised Straw Proposal regarding Flexible Resource Adequacy Criteria and Must-Offer		

Obligation (FRAC-MOO), which was published January 17, 2014. TURN's comments address five specific topics.

ISO Response

No response required.

The Stakeholder Process Must Not Be Hurried

After issuing five straw proposals and holding corollary stakeholder meetings over the course of a year, the CAISO issued its current proposal earlier this month.1 Though this sixth proposal contained some features that were radically different from the prior five proposals, the CAISO did not see fit to extend the stakeholder process beyond its single remaining month.2 TURN is concerned that some of the major changes in the Fifth Revised Proposal need more significant review and discussion than allowed for in this next month.

In making this point, TURN is not criticizing the CAISO for the act of proposing major changes to its prior proposals. TURN instead generally supports the CAISO's willingness to propose major revisions when appropriate, especially on a challenging and groundbreaking project like the FRAC-MOO tariff. But TURN is concerned that a truncated stakeholder process will not yield adequate consideration of the CAISO's current proposal.

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1. The first five proposals were a "Straw Proposal" followed by four sequentially-numbered "Revised Straw
Proposals". The current "Fifth Straw Proposal" is thus the sixth version. See
http://www.caiso.com/informed/Pages/StakeholderProcesses/FlexibleResourceAdequacyCriteria-
MustOfferObligations.aspx .

2. See pages 9-10 of Fifth Revised Straw Proposal regarding Flexible Resource Adequacy Criteria and Must-
Offer Obligation (Fifth Revised Proposal) , available at
http://www.caiso.com/Documents/FifthRevisedStrawProposal-

FlexibleRACriteriaMustOfferObligation.pdf .

ISO Response

The ISO appreciates the concerns voiced by TURN. The ISO has made several clarifying points in the draft final proposal and believes that additional changes beyond these should be minimal and only clarifying in nature. Additionally, many of the issues stakeholders asserted required additional time and discussion have been deferred and will be addressed in the Reliability Services Initiative.

New "Technology Agnostic" MOO Categories May Not Yield An Effective Resource Mix

The "back-of-the-envelope" nature of the development of the proposed MOO categories and their minimum and maximum proportions in LSEs' portfolios does not inspire confidence they will yield an adequate mixture of various types of flexible capacity.3 And the variation in such percentages between months layers another commercial complexity into Flexible Capacity Requirement (FCR) procurement. Rather than adopt the specific categories now proposed, including the related minimum and maximum percentages, the CAISO should encourage further analysis by making public the amount of current capacity that can meet the criteria of these buckets, much as the CAISO has previously provided relevant units' Effective Flexible Capacity.4

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3. Fifth Revised Proposal, pp. 24-31.

4. TURN realizes that resource owners might not necessarily offer a unit's EFC into its most valuable
category, but information on the make-up of current EFC by the proposed categories would be quite useful
in analyzing this latest proposal.

ISO Response

The ISO considered fixed percentages for each month. However, even with fixed percentages,

the actual flexible MW quantity will change from month to month. Therefore, the ISO does not believe there is any benefit gained by fixing the percent contribution to each category for the year.

Additionally, the ISO will conduct on-going assessments to determine how well the categories function to provide the flexible capacity required to address the ISO's flexible capacity needs. At this time we expect that additional information will be available on system needs as well as new procurement policies developed by the CPUC and ISO related to the Joint Reliability Plan developed in 2013 which will provide the basis for potential changes to the proposed flexible capacity product definition. Given the significance of these changes, continued assessment is important to ensure that this addition to the RA construct procures sufficient flexible capacity to address the flexible capacity needs. Second, because the flexible capacity categories and required procurement are new, the on-going assessments will provide information about how well the designed categories are providing flexible capacity that meets the system's operational needs and may identify areas where adjustments or improvements could be made. For example, with actual experience under the three-categories, the ISO may determine that an additional flexible capacity category requiring more than six hours of energy is necessary or there may be opportunities to refine the categories to better accommodate opportunities for preferred resource participation.

New "Technology Agnostic" MOO Categories May Also Be Discriminatory.

TURN understands that the CAISO developed its new categories of "technology-agnostic" must-offer obligations because of concern its prior proposals' obligations were too "technology-specific" and seen by some as discriminatory. However, the proposed new categories may discriminate in their own ways. In particular, the definitions of these categories could instead serve to favor gasfired generation and greatly limit opportunities for other resources, including the state's "preferred resources," to meet flexibility requirements.

ISO Response

The ISO's shift to technology agnostic buckets was made to address the ISO flexible capacity needs. The ISO is the agency with best ability to determine these needs. The LRA still has the ability to determine what portfolio of resources their jurisdiction LSE's can or should procure. Therefore, while the ISO has set the levels of the categories, it is up to the LRA to determine if procurement within a category should be dedicated to a specific resource technology.

Ambitious Data Requirements for Computing FCR and Allocations May Stymie Implementation.

The latest proposal would also compute FCRs and their allocation based on renewable resource portfolio data to be provided by the Load-Serving Entities' through their Scheduling Coordinators.5 Though the proposal includes some means for holding LSEs accountable for their submissions,6 TURN believes the CAISO is embarking on a path that will pose major challenges for gathering, validating, and applying renewable resource data in a consistent and accurate manner.

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5 Fifth Revised Proposal, p. 12 and 18-19. Many aspects of these proposals were offered in prior versions.

6 Id., pp. 12-13.

ISO Response

The ISO understands the concerns voiced by TURN and will continue to address the data collection and study methodology in the flexible capacity requirements assessment.

Delay May be Preferable to a Hurried, Partial Implementation.

Given the lack of the above information and the CAISO's deferral of key asset management and contracting issues,7 TURN questions whether implementation of the FCR and FRAC-MOO tariff in 2015 is advisable. There is no evidence that an implementation in 2015 is necessary to maintain reliable service.8 But a hurried, partial implementation in 2015 may do harm to customers, generators and/or other market participants. The CAISO and California Public Utilities Commission (CPUC) should consider whether implementation of a flexible capacity

requirement should be deferred for another year until the difficult challenges can be addressed more fully and deliberately.9

7 Id ., pp. 6-7. The CAISO is proposing to defer implementation of a Standard Flexible Capacity Product, an Opportunity Cost Methodology for Use-limited Resources and Substitution rules for resources on forced outages.

8 In fact, amounts of EFC have already been procured for 2015 and following years well in excess of the CAISO's estimated flexible capacity requirements, primarily by the Investor-Owned Utilities (IOUs), suggesting that implementation of the requirement in 2015 is not necessary to maintain reliability, See "Planned Remarks on behalf of The Utility Reform Network by Kevin Woodruff, prepared for the Federal Energy Regulatory Commission Technical Conference on Flexible and Local Resources Needed for Reliability in the California Wholesale Electric Market, Docket No. AD13-5-000, July 31, 2013, available at http://elibrary.ferc.gov/idmws/search/fercgensearch.asp

9 Though TURN questions whether an FCR and related FRAC-MOO tariff are necessary to provide reliable service in 2015, TURN supports efforts to sift through the challenging implementation issues in time for a 2016 implementation.

ISO Response

The ISO appreciates the concerns voiced by TURN. The ISO has made several

clarifying points in the draft final proposal and believes that additional changes beyond these should be minimal and only clarifying in nature. Additionally, many of the issues stakeholders asserted required additional time and discussion have been deferred and will be addressed in the Reliability Services Initiative.

Company	Date	Submitted By
VIASYN, Inc.	1/31/2014	Sean Breiner (907) 378-9392

Opening Comments

VIASYN appreciates the opportunity to comment on the 5th Revised Straw Proposal of the Flexible Resource Adequacy Criteria & Must-Offer Obligation ISO Stakeholder Initiative. VIASYN supports the initiative and the recent move to a technology agnostic bucket approach for assessing Flexible Resource Adequacy Capacity (Flex-RA).

The comments below are in association with the ineligibility of downward dispatchable capacity to provide the Flex-RA products and the EFC Calculation for hydro resources with storage.

ISO Response

No response required.

CAISO Should Permit Downward Dispatchable Capacity to Provide a Subset of the Flex-RA Category 1 Capacity Product

Although CAISO has committed to “continuing to assess the need for an explicit downward flexibility requirement” VIASYN encourages CAISO to permit downward dispatchable capacity to be eligible as a subset of the Category 1 Flex-RA product

because downward dispatchable VERs1 with a positive forecast during afternoon net-load ramps are capable of (1) decrementing in anticipation of meeting upward ramping needs and (2) decrementing to meet overgeneration and near-overgeneration reliability needs. Further, a capacity-based compensation mechanism for downward dispatchable capacity is needed *in advance* of the materialization of flexibility and overgeneration reliability concerns so as to provide the marketplace and price signal necessary to incentivize the investment in enhancing the dispatchability of the existing and proposed variable and non-dispatchable resource fleet.

With the implementation of CAISO's FERC Order 764 Compliance Proposal under way many asset owners are assessing the economics of the capital investments and system upgrades necessary to provide CAISO with the dispatchability needed to resolve the "quickly growing concern" of downward ramping and overgeneration reliability needs. While permitting VERs to submit decremental economic bids and lowering the bid floor to ($150) are first steps in the development of a market that accounts for and values the products and tools necessary to maintain system reliability, these steps are only slight modifications to the energy product and do not compensate VERs for the higher quality (dispatchable) capacity that they can provide to the market.

As well, the introduction of the Fifteen-Minute Market (FMM) and the move of the Virtual Market from the 5-minute Real-Time Dispatch (RTD) to the FMM is expected to exacerbate RTD price divergence due to the lack of participation of the RTD in this price convergence mechanism. The introduction of the FMM will also increase RTD price volatility because the majority of Real-Time Market (RTM) energy will be financially bound in the FMM, turning the RTD into an exceedingly marginal imbalance market. These changes to the RTM will likely result in increased RTD price divergence, volatility, and occurance of negative price spikes. This is appropriate given the role that the RTD will serve, however the market should offer VERs the tools, and incentivize LSEs to allow VERs, to hedge their exposure to these new market conditions.

In a market that is increasingly characterized by negative and volatile prices, a capacity-based compensation mechanism is the optimal method of fixed cost recovery for downward dispatchable capacity because it more directly aligns the valuation function of the market with the characteristics of the product and removes the reliance on energy price spikes for the recovery of capacity-related costs.

Further, Load Serving Entities (LSEs) have a disincentive to provide VERs with PPA terms that allow dispatch flexibility. Even if the market provided sufficient energy revenue to cover the (fixed) costs of decremental capacity, the existing market structure provides no incentive for LSEs to provide VERs with such higher quality PPA terms. This is an important issue as many LSEs have significant market power in PPA negotiations with their counterparties. Allowing downward dispatchable capacity to be eligible to meet a portion of Category 1 Flex-RA procurement requirements could be an important step that the CAISO takes towards incentivizing LSEs to provide PPA terms with downward dispatchable flexibility. Without this incentive, resources will be unable to mitigate their exposure to negative prices by offering their capacity as dispatchable and limits the quality of the capacity available to the market, reducing the efficacy of optimization solutions for overgeneration and near-overgeneration conditions.

A capacity-based compensation mechanism that recognizes downward dispatchability (1) creates a marketplace for desirable product characteristics, (2) provides a valuable price signal that improves the economics of operating below a VER's forecast, and (3) begins to incentivize LSEs to provide decremental flexibility in their power purchase offerings, improving the quality of the capacity available to the market optimizations.

CAISO should ensure that market design development incentivizes the product characteristics necessary to maintain future system reliability while avoiding excess buildout of non-RPS-mandated resources. In this initiative, focusing *solely* on a

market mechanism that incentivizes sufficient upward dispatchability will ensure excess buildout of capacity and ignores the potentially significant value that VERs could provide given a reliable price signal. Allowing downward dispatchable capacity to be able to provide the Category 1 Flex-RA product will introduce this price signal—providing CAISO, in time, with significant flexibility benefits as the saturation of VERs continues to increase.

ISO Response

While the basis of the flexible capacity requirement is based on the maximum 3-hour upward ramp, the data the ISO presented at the March 20, 2013 CPUC RA workshop shows downward ramping needs are a quickly growing concern. The ISO will continue to assess the need for an explicit downward flexibility requirement.

Effective Flexible Capacity Calculation for Hydro Resources is Overly Stringent

While CAISO's technology agnostic bucket approach to defining Flex-RA capacity requirements is a significant improvement over previous revisions of the draft proposal, hydro resources are discriminated in the calculation of their Effective Flexible Capacity (EFC). Hydro resources with storage are capable of supplying Category 3 (Peak Flexibility) and Category 4 (Super-Peak Flexibility) Flex-RA. These categories require a minimum of three hours of minimum run time to be eligible. The EFC calculation for a hydro resource, however, is based on the six hour energy equivalent output of its storage capacity.

This limitation unnecessarily restricts the options available to the resource category when exploring alternatives for monetizing its flexible capacity. It prohibits the resource from exploring the trade off between, for example: 3 MW Category 1 Flex-RA Vs. 6 MW Category 4 Flex-RA, even though both options require the same total energy output (18

MWh). Depending on the economic condition of the market, one of these two options may be more valuable to the counterparties than the other, and permitting this type of trade-off to occur improves the liquidity of the market.

We encourage CAISO to perform the EFC calculation for hydro resources based on the six hour energy equivalent output of its storage capacity, however allowing the EFC to double if the resource is listed on an RA Plan to be providing Category 3 or Category 4 Flex-RA.

ISO Response

The ISO appreciates this questions and will continue to assess the implications of such a modification based on the ISO on-going assessments if this initial design.

Company	Date	Submitted By
Wärtsilä North America	1/31/2014	Joseph Ferrari Market Development Analyst – Americas Wärtsilä Power Plants 900 Bestgate Rd, Annapolis MD 21401 Tel: 410-573-2100 Joseph.ferrari@wartsila.com

Opening Comments

Wärtsilä North America (Wärtsilä) is happy to provide the following comments to the California Independent System Operator's Flexible Resource Adequacy Criteria and

Must-Offer Obligation, Market and Infrastructure Policy Fifth Revised Straw Proposal, dated January 17, 2014. Wärtsilä is a leading supplier of modern, environmentally advanced, highly efficient and dynamic power plants that allow the maximum amount of intermittent renewable power generation. We offer solutions for power generation markets, from base load to peaking and load following, as well as dynamic system balancing and ultra-fast grid reserve for current and future capacity markets. Our fast track deliveries of complete power plants, together with long-term operation and maintenance agreements, offer our customers flexible capacity in both urban areas and the most demanding remote environments.

In California, our technology is currently serving the grid in three locations: Modesto 50MW, Humboldt 163 MW and Red Bluff 50 MW.

ISO Response

No response required.

A) Sub-3 hour net load changes

Table 2, p. 27- The largest 15 min net load ramps are up to 20% (2.118 GW) of the largest 3 hour ramp (9.635 GW), for Dec 2014 (last row, Table 2).

The focus is maintained on the 3 hour product, while it was noted that 15-90 minute ramps may not be sufficiently met by the proposed 3 hour product.

The concern is that if focus is entirely on securing 3-hour ramp capacity, CAISO may not be able to assure reliability at shorter time scales. Example- resources meeting the 9.635 GW 3-hour ramp (average aggregate ramp rate of 53.53 MW/minute) can only meet the 2.118 GW max 15 min ramp if the 9.635 GW (available in 3 hours) can also

provide 2.118 GW in 15 minutes (average aggregate ramp rate of 141.2 MW/minute).

Question/Comment: Does CAISO see this (shorter time-scale) need being met by other resources/market mechanisms?

Question/Comment: Would CAISO consider two additional categories? One suggestion would be;

- Monthly Max 15-minute limited 3-hour Net Load change
- Monthly Min 15-minute limited 3-hour Net Load Change

Each defined over 3 hour periods, where Net Load may not exhibit a continuous up-ramp, but which do include significant 15-minute net load changes. Therefore the magnitude specified will equal the largest (and smallest) 15 minute ramp needs. By definition, if flexible capacity can attend to 15 minute net load changes, they can also be useful for 60, 90 and 180 minute net load changes. This may require additional categories (5.4) and definitions of their must offer obligations (5.5).

ISO Response

The ISO as stated several times that more granular definitions of flexible capacity needs (i.e. load following). Additionally, the CPUC's recent RA ruling has said that the proposed RA construct would be modified by 2018. As such, the ISO views the current proposal as a first step and the proposal will be modified in the future as the definitions of flexible capacity become more granular.

B) Counting of Flexible Capacity Resources (6)

The definitions for Effective Flexible Capacity (EFC) are divided into 2 categories based on start-up time (SUT): Units with SUT > 90 minutes and Units with SUT <= 90

minutes.

While the summation of EFC may indicate supply of flexible GW to match the largest 3-hour net load change, there is insufficient detail to specify how the aggregate EFC will do this.

Units with SUT > 90 minutes are ramp rate limited and can be considered “Spin EFC”. Because these units are spinning, there are no start-time lags and it can reasonably be assumed they are capable of going from lower loads to the higher load necessary to meet the X GW max 3-hour net load change (yet insufficient information to guarantee it meets the ramp rates needed for intra-3-hour net load changes).

Units with SUT <= 90 minutes are limited by SUT and ramp rate. We appreciate CAISOs use of thermal non-spin units as flexible capacity as they provide substantial benefits in providing the needed capabilities while doing so with zero CO2 generation, and in the context of California’s potential goal of 50% RPS, a valuable means to reduce potential over generation.

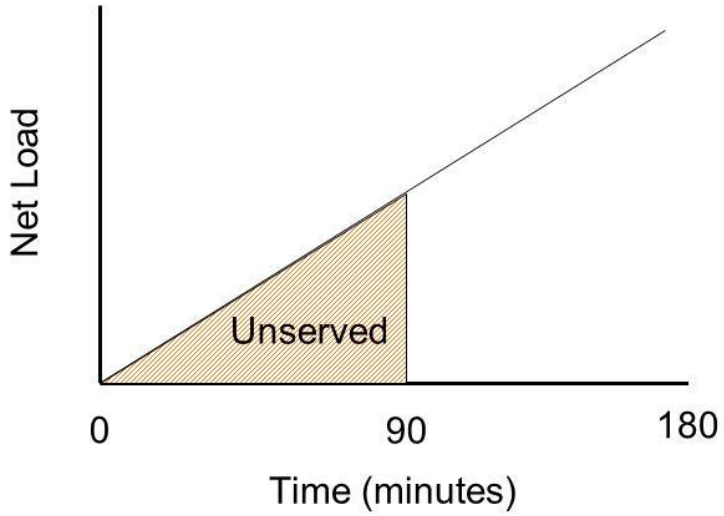
Many thermal units with SUT < 90 min can also reach full load in 180 minutes, so they can effectively bid their entire NQC as EFC.

Comment/Question: The concern can best be addressed with a hypothetical scenario. Imagine;

- Max Net Load change over 180 min is a linear ramp
- ALL flexible capacity resources for an SC are in the category SUT <= 90 min
- Each unit had SUT = 90 min, and could go from min to full load in 90 min

Under this scenario not a single MW of ramp capacity is provided by flexible capacity resources for the 1st 90 min of net load change, essentially leaving the 1st 90 minutes

unserved (see Fig. below). This shortfall can potentially be filled by alternate mechanisms (other sources of reserve energy or ramp capacity), but it would be ideal if the majority of net load change were provided by assets counted towards flexible capacity resources, because that is their stated purpose.



Recommendation: Scale the definition of EFC for units with SUT <= 90 min relative to the amount of area they provide under the net load change curve for the expected maximum monthly 3 hour net load change. This would place higher emphasis and weighting on units with shorter start times and faster ramp rates, and would give a clear indication to CAISO regarding alternate mechanisms it must employ to meet any shortfalls. It should also be noted that the larger the amount of EFC provided by short start time, high ramp rate non-spin resources, the greater the potential to help CA meet its goals for reducing CO2 emissions and potential over generation associated with RPS > 33%.

ISO Response

The ISO as stated several times that more granular definitions of flexible capacity needs

(i.e. load following). Additionally, the CPUC's recent RA ruling has said that the proposed RA construct would be modified by 2018. As such, the ISO views the current proposal as a first step and the proposal will be modified in the future as the definitions of flexible capacity become more granular.

Company	Date	Submitted By
Wellhead	1/30/2014	Grant McDaniel

Comment 1

Wellhead supports the CAISO's Fifth Revised Straw Proposal of the Flexible Resource Adequacy Criteria and Must-Offer Obligation in its entirety, including the deferral of the SFCP and substitution rules.

Wellhead would specifically like to applaud the CAISO for the development of the four distinct technology agnostic categories; though we believe that further granularity of the definitions (specifically category 1) should be provided to the stakeholders as soon as possible. Wellhead believes that the use of these categories, derived from a needs-based approach, will provide the CAISO with the right resources required to meet its ramping needs and provide an incentive for new technologies to provide greater range.

Wellhead encourages the ISO to continue to assess the need for provisions that would limit the amount of baseload and/or PMin as part of capacity showings by publishing a soft target.

ISO Response

The ISO appreciates the support for the proposal

Company	Date	Submitted By
Western Power Trading Forum Comments		Ellen Wolfe, Resero Consulting for WPTF, 916 791-4533, ewolfe@resero.com

Opening Comments

WPTF appreciates the opportunity to submit comments on the CAISO's Fifth Revised Flexible Resource Adequacy and Must Offer Obligation proposal, dated January 17, 2014. WPTF offers limited comments on those elements that have been modified in the CAISO's 5th revised proposal as well as other remaining WPTF items of concern.

ISO Response

No response required.

WPTF generally supports the ISO's backstop procurement proposal and deferral of certain design elements to phase 2

WPTF supports the CAISO's proposal to defer MOO penalties/incentives until a subsequent phase after consideration has been given to the Reliability Services Auction. It also seems reasonable at this time to defer the opportunity cost and replacement design elements, especially to ensure that the phase 1 design can be implemented in a timely manner.

We request, however, further details about the ISO's proposed backstop procurement and the cost allocation that would result. To this end, we ask that the ISO consider what it would do to procure FRAC when:

- A generic RA deficiency exists but the FRAC and generic deficiencies would accrue to different LRAs?

- Generic RA and flexible RA deficiencies exist and could be procured from separate units? and
- No generic deficiency exists and a generic RA resource may be willing to offer FRAC at less than CPM?

We hope that the ISO is not in a position to need to backstop FRAC before the development of the RSA. However, it seems prudent to have comprehensive and robust rules in place until that time to prescribe how the ISO would effectively backstop a FRAC deficiency.

ISO Response

The ISO has provided additional clarity to these questions in section 7 of the draft final proposal.

WPTF generally supports the ISO's proposal for flexibility categories

We believe the ISO's proposal for flexible categories is an improvement over one that affords different requirements for different technologies without the attribute that more flexible resources can more easily fulfill an LSE's requirement.

ISO Response

The ISO has consolidated the four flexible capacity categories it previously proposed into three categories. This change combines the originally proposed "unlimited" and "limited flexibility" categories into a single category, named "base flexibility" and would allow use-limited resources to provide base flexibility.

ISO needs to further specify categories

WPTF asks that the ISO refine the proposed category criteria. In particular, the extent to which use limitations preclude satisfaction of category 1 and category 2 definitions needs clarification, and based on the stakeholder discussions it seems the use of the formal “Use-Limited” tariff definition is unnecessarily constraining. Rather we ask that the ISO clarify that any unit that can meet the offer requirement for a particular category be considered as eligible for that category.

ISO Response

The ISO has combined the previous “unlimited” and “limited” categories into a single category for two reasons. First, after reviewing the 2014 RA showings from CPUC jurisdictional LSEs, which are the only LSEs that provided their LRA with a flexible capacity showing for 2014, the ISO believes that it is not necessary to include an explicit category with 17 hour energy requirements at this time. Although it would result in operational concerns if all resources in the new base flexibility category had a six hour energy limit, there were a limited number of energy limited resources provided in the 2014 showings that would qualify for the new base flexibility category. Therefore, the ISO believes that the proposal can be simplified at this time by combining the unlimited and limited flexibility categories. Second, and closely related, while the ISO expects that there will be a need for an explicit provision for resources that can provide greater than six hours of energy, at this time there is insufficient information available to specifically define such a requirement. See Sections 5.4 and 5.5 for additional details.

The error term needs further specification

WPTF agrees with the CAISO staff that an unspecified error term creates risk, and thereby costs, for market participants. We recognize the ISO’s interest in being able to modify the requirement formulation. However, we believe that any substantial modification would warrant a subsequent FERC authorization.

We question, however, the proposed error formulation whereby the ISO is proposing an error adder as opposed to an error multiplier. WPTF questions whether a multiplier might be more appropriate, more easily allowing an error range to be specified. Our recommendation is that the ISO consider specifying two ranges, one in which the ISO staff could make a change to the requirement following an abbreviated stakeholder process, and a larger range wherein the ISO could make a change to the requirement following board approval. To make changes outside of this broader range would warrant FERC approval. WPTF also proposes that the ISO impose a limit on the change the ISO can make in the error factor from year-to-year.

Such a set of ranges might be as follows.
- CAISO sets flexibility multiplier factor within +/- 3% (e.g., between 97% and 103%) each year based on an stakeholder process
- To set the factor beyond +/- 3% but within +/- 6%, or to change the factor by more than 3% from the prior year, warrants board approval
- To set the factor outside the +/- 6% range or to change the factor by more than 6% per year requires FERC approval.

We believe such a set of limitations would significantly reduce the risks market participants would recognize from the possibility of unexpected changes to the flexibility requirements.

ISO Response

The ISO appreciates the input on the appropriate level for setting the error term. The ISO will, as part of its annual flexible capacity requirements study, assess the need to utilize a non-zero error term and will provide ample opportunity for stakeholders to provide feedback.

LSEs need flexible RA information as soon as possible to contain the cost of procuring flexible RA for 2015
LSEs have a very short window to procure flexible RA for the 2015 year. WPTF has significant concerns that by not providing the EFC values by September it will make it unworkable for LSEs to procure FRAC in time for the 2016 showing. Anything the CAISO can do to post LSE requirements and guidance regarding flexible categories, as soon as possible will reduce LSEs' flexible RA procurement costs.
ISO Response
The ISO will post draft EFC as soon as possible and along with the NQC of resources.
To the extent the CAISO and CPUC policies and timelines aligned, FRAC costs can be reduced
The CAISO has proposed to provide to the CPUC both the CPUC's (as a Local Reliability Authority, or "LRA") share of FRAC requirements and the individual LSE's requirements within the CPUC LRA. We encourage the ISO to work with the CPUC in the CPUC's development of FRAC requirements to align the allocation of FRAC to LSEs consistent with the ISO's determination of LRA FRAC requirements based on each LSE's contribution to the burden. Doing so will ensure cost-causation carries through to the CPUC jurisdiction. Similarly to the extent that timelines between the ISO and CPUC can be aligned, the procurement process will be more efficient and the FRAC costs lower.
ISO Response
The ISO continues to work with the CPUC and other LRAs to align any flexible capacity

procurement, counting provisions, and timelines to the greatest extent possible.

Further guidance is needed from the ISO regarding CHP

In discussion with ISO staff, the staff has indicated that they agree that Combined Heat and Power resources should only contract for that range of their output for which flexible market bids can be offered. In this sense even if the ISO posts an EFC that may exceed the resource's ability to offer economic bids for the full ISO-determined EFC range it is perfectly acceptable that a resource owner only offer in bilateral contracting that range for flexible RA that it can provide without impacting its needs to self-schedule to meet other host obligations. In this manner the resource can continue to provide generic RA only for that portion of its range that is not flexible given the other host needs. However, CPUC staff-proposed policies call for CHP resources to be "bid to the fullest extent possible". Staff RA Proposal dated, 1/16/2014, p. 5. WPTF is concerned both because the CPUC seems to view the flexible RA as resource-based and not range based, and because the directive to "bid to the fullest extent possible" may establish offer obligations that extend beyond the capacity negotiated bilaterally between parties.

We request that the ISO provide clear guidance in its policy that flexible RA resource is only expected to offer as flexible the range that it sold as FRAC, rather than there being an expectation that at any point in time quantities beyond the contracted range must be offered into the CAISO market economically.

ISO Response

See the responses provided to Cogeneration of California, above.

Further clarity is warranted regarding confidentiality

LSEs will soon be required to submit resource data to the ISO, yet it is unclear the extent to which will protect the confidentiality of that data. WPTF requests that the ISO ensure that LSE-specific information is not released publicly, and that public information is sufficiently grossed up across LSEs that any data is released can be assured to no longer be business sensitive.
ISO Response
The ISO will maintain all confidential information consistent with all provisions of the ISO tariff.