

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Oversee)	
the Resource Adequacy Program, Consider)	Rulemaking 14-10-010
Program Refinements, and Establish Annual)	(Filed October 16, 2014)
Local and Flexible Procurement Obligations)	
<u>for the 2016 and 2017 Compliance Years.</u>)	

**COMMENTS AND PROPOSAL OF THE
CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

The California Independent System Operator Corporation (“CAISO”) respectfully submits its comments and proposal in response to the Administrative Law Judge’s Ruling Seeking Party Comments and Proposals (December 12, 2014) and in accordance with the Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge (January 6, 2015).¹

I. SUMMARY

The CAISO continues to support the CPUC’s annual review of the resource adequacy program and its on-going commitment to enhance the effectiveness of the program and to make changes needed to respond to changing system conditions, such as the recently adopted flexible capacity procurement obligation. In this proceeding, the CAISO discusses the need to refine the resource adequacy provisions in two areas. The CAISO’s comments suggest that the CPUC consider reviewing the *local* resource adequacy capacity requirements for demand response and energy storage resources. Under the current method, the local capacity requirements are reduced to reflect demand response, which does not take into consideration whether use-limited demand

¹ Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge, R14-10-010 (January 6, 2015), pp. 4-5 (“January 6 Scoping Memo”).

response is dispatchable by the CAISO or can be available to the CAISO within the short time-frame necessary to resolve a contingency condition. The CAISO suggests that review of this area could be initiated in this or the next phase of the proceeding, with final resolution reached in phase 3.

The CAISO's proposal recommends that, in the monthly and annual resource adequacy process, a load serving entity's local capacity requirement be capped at that load serving entity's system requirement. The purpose of this proposal is to address the situation where, during some months of the year, a load serving entity may be required to demonstrate local capacity in excess of its monthly peak demand and reserve margin. This will not impact the current local capacity technical study methodology used to determine the load serving entity local capacity requirements each year.

II. COMMENTS

In response to the series of questions posed in the December 12 ruling, the CAISO offers the following comments.

1. *Are the current eligibility criteria for energy storage and demand response (DR) appropriate? If not, what changes would you recommend? If you recommend less stringent eligibility criteria, please consider any restrictions that may need to be clarified such as resource type limitations, capacity caps, regional considerations and Local vs. System RA status, and any other constraints that may be advisable. Please also consider how any changes to eligibility criteria would interact with NQC and Effective Flexible Capacity (EFC) listings, Maximum Cumulative Capacity (MCC) buckets, other CPUC programs and proceedings, and CAISO processes such as MasterFile reporting.*

The CAISO believes the existing resource adequacy eligibility criteria for demand response and energy storage resources to satisfy system and flexible resource adequacy requirements are adequate at this time and do not require review in this phase of the proceeding. The existing eligibility criteria for these resources to count as

system and flexible resource adequacy capacity reasonably align with the CAISO's current capacity needs. Such criteria only became effective in the 2015 RA year; so, there will be little, if any, experience upon which to base any reevaluation. There is no need or basis to reevaluate the eligibility criteria at this time, particularly in light of potential flexible capacity changes on the horizon.

For instance, the January 6 Scoping Memo identifies development of a permanent flexible capacity program as an issue within the scope of phase 2 of this proceeding. Given that phase 2 will review the existing flexible capacity product and may result in changes to the eligibility criteria for flexible capacity, attempts to make specific changes to eligibility rules in phase 1 of the proceeding is premature and should be deferred until the outcome of phase 2 is known. This will also allow the parties to gain experience with the new flexible capacity rules and eligibility criteria, which can then inform any reevaluation of the eligibility criteria.

Although the CAISO does not propose changes to *system* and flexible resource adequacy capacity requirements at this time for demand response and energy storage resources, the CAISO believes that *local* resource adequacy capacity requirements for demand response and energy storage resources do require additional refinement. Local capacity requirements are based on the ability of the local capacity area to maintain stability even if two critical elements are lost under an N-1-1 planning criteria. More specifically, local capacity must be able to restore the system to pre-emergency conditions within 30 minutes after the loss of the first critical element (N-1).

Given these stringent requirements, which are driven by NERC standards, the current method of reducing local capacity requirements, simply because demand

response can be dispatched locally, is not a sufficient reason for reducing local capacity. The requirements do not take into account whether use-limited demand response is dispatchable by the CAISO and can be fully available to the CAISO within 20 minutes, which is necessary to resolve a contingency condition within 30 minutes, as required by NERC standards.²

Thus, the CAISO is suggesting that the requirements and qualification of use-limited resources as local capacity resource adequacy resources be further refined in later phases of this resource adequacy proceeding. As a next step, the CAISO suggests discussion about how use-limited resources qualify as local capacity resources begin in this or the next phase of this resource adequacy proceeding, with final resolution reached in phase 3.³

Beyond refining local capacity requirements for demand response and other use-limited resources, some of the demand response counting rules that may arise from the commission's bifurcation ruling in decision D.14-12-024 are complex and will take time to resolve. For example, the CAISO believes that the following issues may require extended discussion:

- Will the existing evaluation, measurement and verification methodologies work or will new methodologies be required to assess load impacts of

² NERC Standard TOP-004-2- Transmission Operations- requires that when a contingency condition occurs, the transmission operator must restore operations to respect proven reliable power system limits within 30 minutes. The CAISO is stating that local resource adequacy capacity qualifying demand response resources must be available within 20-minutes to ensure the CAISO can restore the system to pre-contingency limits within 30 minutes. See NERC TOP-004-02 at <http://www.nerc.com/ layouts/PrintStandard.aspx?standardnumber=TOP-004-2&title=Transmission%20Operations&jurisdiction=United%20States>

³ The January 6 Scoping Memo confirmed that consideration of that issue is a topic within the scope of phase 3. The CAISO believes this approach is reasonable and will ensure that all the demand response counting rules changes will be completed prior to the 2018 resource adequacy year.

supply demand response resources?

- How will load impacts from load-modifying demand response resources be used in the CEC IEPR forecast to reduce resource adequacy requirements?
- Are new effective flexible capacity counting provisions needed for supply-side demand response?

To allow sufficient time for discussion and resolution of these issues, the CAISO recommends that the Commission expand the scope of phase 2 to include review of the demand response resource adequacy counting rules. This would allow the discussion to begin earlier, even if the issues are not resolved until phase 3.

With regard to the question about less stringent eligibility criteria, the CAISO at this time does not believe that less stringent planning criteria are appropriate, and there is no experience with the existing criteria to show otherwise. For example, in the CAISO's transmission planning process, some parties have suggested that it would be operationally possible to allow for a two-hour system capacity product.⁴ However, resource adequacy uses four-hour energy production to account for forecast error and uncertainty about when the actual system will peak. To date, the CAISO has not conducted an assessment to determine if or how a resource adequacy resource that provided energy for less than four hours would be able to ensure that the CAISO could provide a comparable level of system and local reliability.

Further, it is important to recognize that resource adequacy is a planning function. Operationally, certain system needs may be served by 1-hour, 2-hour or 6-

⁴ See comments of Southern California Edison in the 2013-2014 Transmission Planning Process at http://www.aiso.com/Documents/SCEComments-Sep25-26_2013Meetings.pdf

hour resources. However, what is needed in any specific operational scenario should not be confused with determining what are reasonable resource adequacy planning standards and requirements to reasonably ensure a broad cross-section of operational needs can be satisfied across a broad set of time horizons.

2. *Should the measurement hours be changed for any resources? If so, how?*

The CAISO is not certain what measurement hours this question references. However, as the CAISO states above, the important point is to ensure reasonable resource adequacy planning standards and requirements that reasonably satisfy a broad array of operational conditions.

If the question is whether the CPUC should review the hours during which a resource adequacy resource should be available, the CAISO's response is that such review is unnecessary. Currently the peak hours used by the CPUC and the assessment hours of the CAISO's standard capacity product are aligned. While the CAISO is proposing to improve the existing standard capacity product in the reliability services initiative, it is not proposing to change the assessment hours over which the availability of resource adequacy capacity is measured. Further, the addition of flexible capacity assessment hours to the standard capacity product are consistent with the required hours approved by the CPUC in D.14-06-050.

Additionally, while the CAISO's studies in LTPP have identified capacity shortfalls in off-peak periods, using ELCC for calculating the qualifying capacity for wind and solar resources may provide additional insight into how to determine

the reliability contribution for these resources. However, any reassessment of resource availability hours should be deferred until there is additional progress on the ELCC studies and should be coordinated with the CAISO to ensure availability hours and incentives are consistent. This is important because misalignment between the CPUC and CAISO availability hours could lead to unnecessary confusion regarding resource obligations and performance, potentially degrading the goals of the resource adequacy program.

3. *Should any changes be made to the MCC bucket system, or should any particular analysis be conducted to enable future refinements or changes to the current system?*

The January 6 Scoping Memo identifies the development of a durable flexible capacity product as the primary objective of phase 2 of this proceeding. The CAISO believes that once the durable flexible capacity product is established, the Commission will have sufficient basis and information to assess whether changes are needed to the MCC buckets. The studies conducted to develop the durable flexible capacity product will provide important and relevant information necessary for the Commission's consideration of any redesign (i.e. how might a redesign of the MCC buckets incorporate a durable flexible capacity product along with system capacity). Therefore, the CAISO does not believe the MCC buckets require review in phase 1 of this proceeding.

4. *In its flexible resource adequacy criteria and must offer obligations (FRAC-MOO) initiative, the California Independent System Operator (CAISO) proposed that energy storage resources wishing to qualify as Flexible RA based on both charge and discharge capabilities should be required to register as non-generator resources (NGR). The following questions relate to this and to related concepts.*

- a. *Is the NGR requirement of continuous operation through the transition point (moving without interruption from charge to discharge mode) appropriate, and why?*

One of the primary goals of the initial flexible capacity product is to ensure that both short-term variability and longer sustained ramps can be addressed by a single product. The CAISO's NGR model is ideally designed to address flexible capacity from the storage portion of energy storage resources. The continuous transition between charge and discharge allows for a smooth transition of the energy storage resource during peak net load ramping hours (*i.e.*, depicted in the CAISO's duck chart, the load ramp from the belly of the duck (early afternoon) to the neck (evening)) as well as managing shorter duration flexibility needs. It is not clear at this time that the same can be said for discontinuous transition periods. The reliability impact of a transition time for energy storage resources for flexible capacity, regardless of duration, is unclear.

The CAISO's NGR model efficiently manages flexible capacity between the charge and discharge capabilities of a storage resource, with both states being dispatchable every five minutes. The NGR model, however, does not allow for a transition time. Currently, the resources with transition times would fall under the pumped storage hydro model, which treats the resource as two resources (load and generation). While this model works reasonably well to ensure the resource is able to charge for peak load, it is not clear that such a model is well suited for addressing the CAISO's need for five-minute dispatchability or transitioning from charge to discharge during peak net load ramping hours.

NGRs are treated as generators (with positive and negative output). Their ability to continuously move between positive and negative output bolsters their treatment as a

generator. Introducing the concept of transition times between positive and negative output weakens their treatment as a generator and begins to make them look more like a combination of generation and load.

The pumped storage hydro model, unlike the NGR model, lacks detail regarding the parameters for the load component of the resource (*i.e.* start-up time, ramp rates) and is not five-minute dispatchable for the pumping portion of the resource. The CAISO is still assessing how well the pumped storage hydro model would work for ensuring adequate flexible capacity from the charging portion of storage resources with transition time.

In short, the CAISO does not currently have a resource model that can effectively manage an energy storage resource with a transition time. The CAISO may need to consider designing a new product that would likely pull various aspects from the existing models for NGR, pumped storage hydro, and multistage generation resources. In any event, this raises reliability concerns and is a reliability question. The CAISO is uniquely situated to assess the reliability concerns and grid and operational impacts that arise from energy storage resources that do not meet the requirements of the NGR model and develop an appropriate model.

Further, consistent with the CAISO's tariff, the CAISO would utilize its flexible capacity provisions to determine the flexible capacity shown in the flexible capacity plans meets the system requirement.⁵ The CAISO's current tariff provisions do not provide for the charging capacity of non-NGRs to be eligible as flexible capacity, potentially leading to a system wide deficiency. Allowing the storage portion of a non-

⁵ CAISO Tariff, Section 40.10.5.3(c).

NGR as flexible capacity may increase the likelihood of a system flexible capacity shortfall, requiring the CAISO to procure backstop capacity under its capacity procurement mechanism. Accordingly, to minimize the likelihood of backstop procurement, any changes to account for transition time in the CPUC's flexible capacity counting rules should be closely coordinated with the CAISO to ensure reliability is maintained and that the CPUC and CAISO provisions align.

- b. How might discontinuous operation through the transition point be similar to or different from the concept of "forbidden operating zones" for conventional generators?*

The concept of the forbidden operating zone and transition times are different operation attributes of resources, and both are supported by the CAISO's multistage generation model. However, the multistage generation model does not accommodate the ability for a resource to provide negative generation. As noted above, the CAISO would need to design a new product that would likely pull various aspects from the existing models for NGR, pumped storage hydro, and multistage generation resources to ensure the CAISO is able to utilize a resource with a transition time consistent with the flexible capacity obligation it was procured to fulfill.

- c. If a transition period between charging and discharging is advisable, how long of a transition period is acceptable, and why?*

An appropriate transition period cannot be determined in this phase of the proceeding. Additional analysis must first be undertaken by the CAISO to identify the market enhancements that would be required and to consider the net benefits of pursuing such enhancements. Only then could the CAISO assess what transition time and nature of this transition would be appropriate parameters for maintaining reliability and determining the eligibility of an energy storage resource to provide flexible capacity.

- d. *If a transition period between charging and discharging is advisable, should there be any restrictions on discontinuity in output (difference between $P_{demandmin}$ and $P_{supplymin}$), and why?*

See the response to the question 4.c above.

- e. *Are the bidding limitations for NGRs described in Section 4.1.1 of the CAISO BPM for Market Instruments appropriate to apply to energy storage resources that wish to qualify as Flexible RA resources? If not, why not?*

See the response to the question 4.c above. There must be a connection between how a resource is counted as flexible, system or local capacity and the qualifications and the availability criteria. Therefore, it is reasonable to apply the identified bidding limitations to energy storage resources that wish to qualify as flexible resource adequacy resources.

- f. *Should the NGR designation or a similar, modified designation be applied to behind-the-meter storage resources? What issues or modifications should be considered? Please consider both exporting and non-exporting resources.*

To the extent an energy storage resource wishes to count both the charge and discharge aspects for flexible capacity, the answer to the first question is yes. Only the NGR model has the functionality to provide both positive and negative energy as a single resource. See the response to the question 4.a above. The CAISO's NGR model efficiently manages flexible capacity between the charge and discharge capabilities of a storage resource, with both states being dispatchable every five minutes. As part of its broader efforts to enhance the participation of storage in CAISO markets, the CAISO is considering conducting a review of the NGR model with CAISO stakeholders in 2015.

- g. Should energy storage resources wishing to qualify as Flexible RA be required to register as NGR resources? Why or why not? Should any changes be made to the NGR requirements in order to facilitate participation of energy storage resources in the RA program?*

If energy storage resources want to count charge and discharge, the answer to the first question is yes. See the response to question 4a. The CAISO is currently reviewing the market products available for energy storage resources. If it determines that such market products would require changes to the CAISO tariff, the CAISO will conduct a stakeholder process to discuss the proposed changes. The CAISO stakeholder process is the appropriate forum to consider the policy and tariff changes that would be needed to implement a new market product for energy storage resources. The CAISO would coordinate any such changes with the CPUC.

- h. Should the NQC of behind-the-meter storage resources registered as Proxy Demand Resources (PDR) be based on metered performance or testing, instead of the current 10-in-10 baseline methodology (load impact protocol) for DR? If so, what methodology or protocol is appropriate?*

When metering information is available, the CAISO believes that more reliable measurements of PDR performance can be determined and should be relied on over the baseline measurement.

III. LOCAL REQUIREMENT COUNTING METHODOLOGY PROPOSAL

The CAISO proposes the following modification to the determination of the local capacity requirement. This change is needed to accommodate the CAISO's current and future planned outage replacement requirements. In the monthly and annual resource adequacy process, the CAISO proposes to cap a load serving entity's local capacity requirement at that load serving entity's system requirement. This will not impact the current local capacity technical study methodology used to determine the load serving

entity local capacity requirements each year.

The purpose of this proposal is to address the situation where, during some months of the year, a load serving entity may be required to demonstrate local capacity in excess of its monthly peak demand and reserve margin. This could occur because the local requirement is determined for August and then applied to all months in order to assure local reliability. Since the inception of the local capacity technical study, peak load requirements have become increasingly different from month to month. As a result, the potential exists for the monthly local requirement to be greater than the monthly system requirement.

If a load serving entity commits more local resource adequacy capacity in its monthly plan than its system resource adequacy capacity requirement, there could be negative consequences under the CAISO's replacement requirement. First, if the load serving entity's own monthly plan includes resources with planned outages and the CAISO determines that replacement of the capacity on outage is necessary, the load serving entity could be required to provide total capacity in aggregate beyond the load serving entity's peak demand and reserve margin requirement. Second, other load serving entities may include resources in their monthly plan that will be on planned outage, and thereby lean on the over-committed capacity to avoid a replacement requirement.

The CAISO believes it is reasonable to only require total commitment of resource adequacy capacity up to a load serving entity's peak demand and reserve margin requirements. In months where the peak demand and reserve margin requirement is less than the local requirement, the CAISO would still receive local resource adequacy

commitment up to the updated forecasted peak demand and reserve margin for that month. Therefore all committed capacity would be local capacity for these load serving entities. There is no reliability reason why the CAISO should require additional local capacity beyond the peak demand and reserve margin requirements. Accordingly, the CAISO proposes to cap a load serving entity's local capacity requirement at that load serving entity's system requirement.

IV. CONCLUSION

For the foregoing reasons, the CAISO respectfully requests that the CPUC issue a decision consistent with the CAISO's comments and proposal.

Respectfully submitted,

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