



Stakeholder Comments Template

Resource Adequacy Enhancements

This template has been created for submission of stakeholder comments on the Resource Adequacy Enhancements working group on June 10, 2020. The stakeholder call presentation, and other information related to this initiative may be found on the initiative webpage at: <http://www.caiso.com/StakeholderProcesses/Resource-Adequacy-Enhancements>

Upon completion of this template, please submit it to initiativecomments@caiso.com. Submissions are requested by close of business on **June 24, 2020**.

Submitted by	Organization	Date Submitted
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Please provide your organization's comments on the following issues and questions.

1. Production Simulation: Determining UCAP Needs and Portfolio Assessment

Please provide your organization's feedback on the Production simulation: Determining UCAP needs and portfolio assessment topic as described in slides 4-15. Please explain your rationale and include examples if applicable.

LS Power supports this element of CAISO proposal.

2. Transitioning to UCAP Paradigm

Please provide your organization's feedback on the transitioning to UCAP paradigm topic as described in slides 16-19. Please explain your rationale and include examples if applicable.

LS Power supports Option 2. This option clearly defines the distinction between UCAP & NQC which the Buyer & Seller of RA contracts should be able to correctly capture in any existing and new contracts. Option 1 proposes to change the existing definition of NQC, introduces a new term DQC and as noted by CAISO will cause confusion

between counterparties for RA contracts. Moreover, by altering the current definition of NQC by incorporating forced outage rate will undoubtedly reduce NQC for most resources which will also have unintended consequences of reducing EFC for certain resource types¹.

3. Unforced Capacity Evaluations

Please provide your organization's feedback on the unforced capacity evaluations topic as described in slides 20-59. Please explain your rationale and include examples if applicable.

- a. Please provide your organization's feedback on the UCAP methodology: Seasonal availability factors topic as described in slides 27-46. Please explain your rationale and include examples if applicable.

LS Power does not support Option 1 for calculating UCAP for new resources discussed on slide 45, especially for newer technology resources, such as Battery storage. Option 1 proposed to calculate UCAP based on historical class average forced outage rates for same technology resources. A major limitation in this approach is that the limited amount of battery storage capacity that is currently operational, is not a sufficiently large sample to establish UCAP for this technology. Many of the early battery storage installations were "pilot/test" projects deployed to prove the technology. A few of these may not even be actively participating in CAISO markets. Using this limited sample will not accurately reflect the improving performance of new installations and UCAP for new resources could be unnecessarily penalized due to the performance of unrepresentative existing resources if this methodology is used. Further by artificially reducing UCAP for new installations based on class average, CAISO may be inadvertently requiring LSEs to procure more RA capacity than it needs which will lead to increased cost to be borne by ratepayers. At the stakeholder call CAISO did not seem to be concerned in using this approach because it believes over 3300 MW of battery storage projects will come online between now and 2023. While that may be true but as currently proposed, CAISO plans to adopt UCAP starting 2023 RA year, which means it will conduct UCAP class average calculations for these resources in 2022. Not all of the 3300 MW battery storage resources will be online by 2022. Even the ones that come online by 2022 will not have 3 year operational history by the time CAISO performs UCAP calculations for class average. Option 1 will not lead to desired outcome hence this should not be implemented.

¹ Currently EFC for Energy Storage Resources on REM is limited to NQC. NQC reduction due to Option 1 methodology will inadvertently reduce EFC for these resources.

LS Power supports Option 2. For first full year of its operation, UCAP for battery storage projects be set equal to the resource's NQC. Subsequent years should factor in that unit's actual forced outage rates, but not those of unrelated projects, to develop UCAP as proposed by CAISO.

- b.** Please provide your organization's feedback on the UCAP methodologies for non-conventional generators topic as described in slides 47-59. Please explain your rationale and include examples if applicable.

Comment 1: this UCAP proposal renders the proposed EOH SOC tool useless and will have unintended consequences

CAISO's proposal on slides 47-51 to incorporate End of Hour State of Charge ("EOH SOC") for storage resources into UCAP calculations is not workable in its current state. As proposed, these restrictions will render the End of Hour State of Charge tool nearly useless, and drive storage owners to rely heavily on Self Schedules to manage their resources in order to ensure that Day Ahead schedules can be physically met. Instead, EOH SOC biddable parameter values should only count against a resource's UCAP in an hour if they render capacity that has received Day Ahead awards incapable of being met in that hour. There is already a strong economic disincentive to withhold capacity using EOH SOC unless absolutely necessary to mitigate risk of failure to meet a Day Ahead dispatch, in the form of opportunity costs from foregone opportunities to profitably discharge in the Real Time market, and penalizing the use of this tool as proposed works against CAISO's own reliability goals by increasing the risk that storage assets with RA obligations and Day Ahead schedules will not be able to manage their resource to physically deliver on its schedule.

For background, it is important to note why EOH SOC was developed in first place. As noted in CAISO's ES DER-4 Draft Final Proposal² EOH SOC was proposed by CAISO in response to "...Stakeholders' desire to more effectively manage their storage resource's state-of-charge in the real-time market to meet day-ahead schedules or other obligations that may be present outside of the real-time market optimization window later in the day..." Stakeholders had "...recognized that while the day-ahead market optimizes the resource across the entire operating day, when participating in the real-time market the resource will receive dispatches based on system supply/demand conditions and prices available in a shorter optimization horizon. This could result in a deviation of the storage resources state-of-charge derived to meet their day-ahead schedules. For instance, based on the resource's bids, the real-time market may find that it is most economic, over the short-term, to leave a storage resource fully discharged early in the day making it incapable of meeting its obligation to deliver on a day-ahead award later in the day..." CAISO noted that "...currently, self-schedules can be utilized to help

² <http://www.caiso.com/InitiativeDocuments/DraftFinalProposalEnergyStorage-DistributedEnergyResourcesPhase4.pdf>

manage the state-of-charge to meet these obligations, however, effective use of them to achieve a desired state-of-charge is difficult due to lag between market execution and bid submission deadlines. Additionally, use of self-schedules limits the CAISO's ability to flexibly dispatch the resource throughout the operating hour it self-schedules. A more effective means for management of state-of-charge in real-time while allowing for greater flexibility of its use is needed..."

In order to address the concerns noted above, the EOH SOC biddable parameter was a very good solution proposed by CAISO. However CAISO's current proposal under this initiative to incorporate EOH SOC into UCAP calculations for storage resources will preclude these resources to make use of this feature and this will defeat the purpose of this feature. We respectfully suggest that CAISO should implement the EOH SOC biddable parameter, but should make adjustments such that use of this feature does not count against resource's availability. In ESDER-4 Draft Final Proposal, CAISO had expressed concern & we agree and support CAISO in that "...a scheduling coordinator should not submit an end-of-hour state-of-charge parameter that is below the resource's must offer obligation, or use it to withhold additional RA Capacity not scheduled in the IFM or RUC...". However, inability of these RA resources to use EOH SOC for Real Time markets risks rendering the tool useless and could lead to unintended consequences. Nearly all of the storage being built in CAISO is being brought online to provide RA. These resources will need to use EOH SOC in real time to better manage their SOC's to meet their Day Ahead schedules resulting from their RA obligations. As explained below there are several reasons why a RA resource would need to use EOH SOC in Real Time. These should not lead to counting against availability for the resource.

EOH SOC can be a valuable tool for Scheduling Coordinators to ensure that a resource's physical operation resulting from dispatches in the real time market is aligned with any schedules from the day ahead market. Doing so can cover off both the resource's market risks of the type discussed in the previous ESDER4 straw proposal's "Minimum Charge Requirement" section (without that proposal's many downsides discussed at the ESDER 4 meeting in March), where a unit ends up empty and exposed to extreme prices, and the grid operator's risk of not having enough generation to serve load in the evening due to a failure to maintain sufficient aggregate state of charge across the storage fleet.

The way EOH SOC would get used in practice is as follows:

A Non Generator Resource ("NGR") submits its Day Ahead bids to CAISO, with economic offers across all hours, thus meeting its RA Must Offer Obligation.

This NGR receives a schedule in the Day Ahead market, most likely with a discharge in the evening.

The NGR's SC would review the Day Ahead schedule, and develop the next day's Real Time bids for each hour of the day. In order to minimize risk of being empty during the hours with a Day Ahead discharge, it will be desirable to gradually increase the minimum EOH SOC during the hours leading up to the DAH schedule. The opportunity cost will appropriately motivate the NGR's SC to present the resource's full capability to the Real Time market to the extent possible, and as such the tool will only be used as a last resort for risk management to ensure that the resource can physically meet its schedule.

During the discharge hours of the Day Ahead schedule, the NGR's SC would logically submit no minimum EOH SOC to allow full operation and coverage of the market schedule. As long as the EOH SOC parameter does not prevent the resource from discharging during its DAH schedule, the goals of the CAISO grid operators, CAISO policy team, and the NGR's SC are all in alignment here.

The results are storage units meeting their RA Must Offer Obligations ("MOOs") in the Day Ahead, and then ensuring that it can physically meet its Day Ahead schedule, with reduced risk to the resource and entire system. The tradeoff of this sequence is that it could somewhat reduce the MW available to discharge in the Real Time market during the hours immediately preceding a Day Ahead discharge. However, this reduction in real time flexibility in off peak hours will dramatically increase the certainty that a resource to be fully available for its Day Ahead schedules when CAISO needs it most, and is far less restrictive than the Minimum Charge Requirements proposal (which was aimed at that exact purpose) and should not affect resource's availability for RA purposes in any way.

There are truly no reasonably likely operational risks that should prevent CAISO from making this tool available to NGRs that have Resource Adequacy contracts. Scheduling Coordinators will naturally be incentivized by their resource's exposure to market prices to minimize the use of this tool, and the tool increases the certainty of resources showing up to hit their Day Ahead schedule. The RA rules for NGRs should therefore be adjusted to allow them to make use of this tool with no reduction of their availability as long as its use supports meeting Day Ahead schedules and is not being used to artificially limit availability in Day Ahead IFM or RUC.

We recommend CAISO not reduce a storage unit's availability based on EOH SOC in Real Time as long as the resource is not reducing its availability through SOC management in Day Ahead, there should be no availability hit for this resource for UCAP calculations. If CAISO's concern is that SCs may "artificially" limit the availability of resources in Real Time then perhaps it should consider developing rules & monitoring to prevent that & penalize resources who may be unnecessarily limiting their availability.

Comment 2: The proposed formula undermines the intent of the EOH SOC tool and is discriminatory against storage. The UCAP calculation for an hour should only consider that single hour with respect to EOH SOC, and should not consider Charging capability

The proposed formula is overly broad, to the point that it is discriminatory against energy storage resources. Furthermore, the specific math proposed does not make sense. Specifically issues with the approach include:

- Every hour is using a 4 hour calculation, which is discriminatory against storage, as no other resource is having its UCAP reduced in a given hour based on what might happen several hours later.*
- The math effectively requires storage to bid into Real Time with absolutely no SOC restrictions 24/7 to avoid a UCAP penalty, which is a far higher bar for Resource Adequacy than for any other resource type. For instance, a gas CCGT that does not receive awards and is not committed in the Day Ahead market has no requirements to offer its full Pmin to Pmax range into every RT period, as that would be physically impossible, but this is effectively being asked of storage here in order to receive the same payment for Resource Adequacy as the CCGT.*
- No other type of resource is required to be able to provide the equivalent of “charging” as an option to the market (the capability to decrease output is best addressed by the market through procuring Regulation Down).*

Only the unit’s capability in a given hour should affect its UCAP in that hour. Take for instance the CAISO’s example “Hour 3” for a 25 MW storage resource w/ 100 MWh of storage capacity

Hour 3: The resource is not on outage (+/- 25 MW) in the real-time market, and they are imposing a minimum end of hour SOC of 25 MWh

Here, if a resource has a SOC anywhere from 50-100 MWh going into Hour 3, it could clearly provide its entire usable capacity to CAISO for the entire hour. Discharging at 25 MW for the whole hour if RT dispatch dictates would still leave energy in the tank and the EOH SOC parameter would be a non-binding constraint, and it makes no sense to penalize resource’s UCAP. Clearly the full capability of the resource is available for the hour, and there should be no impact on UCAP in this hour.

As discussed above, the whole reason a 100 MWh resource might have an EOH SOC of 25 MWh in a given hour is so that the SC can be confident that it can physically deliver on a Day Ahead schedule in an upcoming hour (perhaps the “Hour 3” of this example is really HE 15, and the resource has a Day Ahead schedule to begin discharging in HE 17). The current UCAP proposal thus undermines the ability of the SC to ensure that this Day Ahead schedule is met.

In the scenario where a NGR has a Day Ahead schedule in Hour 3, and the EOH SOC parameter is such that this schedule cannot be met, then there should rightfully be a reduction in availability in the UCAP calculation, but this is a far more specific scenario than what is proposed.

CAISO’s proposal on this topic needs further discussion so the concerns raised above are fully addressed.

Additional comments

Please offer any other feedback your organization would like to provide on the Resource Adequacy Enhancements working group discussion.

Partial RA resources:

LS Power would like CAISO to reconsider how it will treat partial RA resources for the purpose of UCAP calculations & other changes being proposed as part of this proposal. As an example, if a 100 MW resource was only partially deliverable for 40 MW how will CAISO calculate availability for this resource. Further, if the resource in this example only had Resource Adequacy contracts for 30 MW out of its 40 MW Partial Deliverability status, how will UCAP calculate & other elements of this proposal applied.

LS Power thanks CAISO for the opportunity to provide these comments.