

**Comments on the presentation from the September 26, 2017 working group meeting**

<b>Submitted by</b>	<b>Company</b>	<b>Date Submitted</b>
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Calpine was unable to participate in the September 26<sup>th</sup> working group meeting and so offers the following limited comments on the presentation from the meeting, especially the “conceptual proposal” contained in the presentation, as Calpine understands the presentation without having the benefit of actually seeing and hearing the presentation presented.

The presentation includes additional analysis of potential operational flexibility problems experienced by CAISO. It also introduces a conceptual proposal for new flexible RA products that are based on the analysis. Unfortunately, the presentation does not contain any of the analysis that stakeholders, including Calpine, have requested with respect to exactly why the CAISO is experiencing operational flexibility problems, e.g., why are there sometimes insufficient resources committed to manage ramps economically? Is the CAISO attempting to run its system with the wrong resources or is it failing to commit and dispatch optimally the resources that it already has at its disposal? Absent such analysis, it is not clear exactly what problem a revised flexible RA product is trying to address and/or if it were implemented, whether it actually would address the operational flexibility problems that the CAISO has identified.

The conceptual proposal includes four overlapping types of flexible RA capacity designed to address flexibility issues in different time frames. Calpine is not convinced that these products are necessary, i.e., they may address attributes that are already inherent in the current RA fleet, and concerned that they will be difficult to trade. Nevertheless, Calpine thinks that the conceptual proposal represents a positive step towards linking flexible RA products to operational requirements. Calpine offers more detailed comments on the products below. Calpine’s main specific concern about the products is its treatment of coincidence. Calpine sees the requirements targeted by the four products as largely overlapping while the conceptual proposal seems to treat them as independent. Specifying the requirements as independent may overstate the requirements for the four types of capacity in aggregate.

Slides 6-7:

Calpine generally agrees with the objectives of the initiative. In particular, Calpine agrees that the CAISO should be able to meet load net of non-dispatchable resources using economic bids from RA resources in all hours of the year. As Calpine has requested previously, Calpine would like greater analysis of the extent to which the CAISO is falling short of this objective currently and potential explanations for any shortfalls.

One simple way to ensure that the CAISO has sufficient economic bids might be to require LSEs to offer economically capacity covering the entire range between minimum and maximum net load, as CPUC Energy Division proposed several years ago, i.e., specify a single flexible capacity product akin to what the CAISO is now describing as the Day Ahead Product. It would then be up to the spot market to ensure that sufficient resources are committed to meet real-time requirements.

Slide 9:

Calpine agrees that it is important to account for uncertainty in addressing operational flexibility needs. Calpine continues to believe that it is critically important to address how the spot market accounts for uncertainty regardless of how or whether flexible capacity requirements are changed. Why does the CAISO currently exhaust economic bids in certain intervals. If the failure relates to failures to commit enough or certain types of resources, how should commitment change? Would a day-ahead load-following product ensure that the CAISO has sufficient economic bids available in real-time? Even if the CAISO ensures that certain types of resources are procured as flexible RA, how will the spot market ensure that those resources are actually available in real-time?

Slides 11-27:

Similar to other evidence that the CAISO has presented in the past, these slides demonstrate that ramps and net load variability are increasing. While these data points are interesting, in isolation, they provide relatively little insight into the ability of CAISO markets to address ramps and net load variability.

Slides 28-29:

Calpine would appreciate more detailed explanations of the CPS1 violations summarized on these slides. It is Calpine's understanding that penalties for CPS1 violations are based on performance over a year. Are the days shown on these slides typical? Is the CAISO likely to be penalized for CPS1 violations? Why did CPS1 violations occur on these days? What resources were committed? Could CPS1 violations have been avoided had different resources been committed and/or if renewables had been curtailed in advance of the violations?

Slides 30-34:

Calpine appreciates the decomposition of net load variability into different time frames in these slides. This is a valuable and new contribution to discussions about flexible RA.

Calpine wonders whether the uncertainty that is resolved between different unit commitment time frames might inform flexible capacity product design? For example, would it make sense to base a product on uncertainty between the IFM and RTUC because RTUC provides an opportunity to address the resolution of uncertainty through additional unit commitment?

Slides 40-43:

Calpine generally agrees that the CAISO should have sufficient economic bids to meet load and dispatch around inflexible capacity as long as variable renewables such as solar and wind are not assumed inflexible and that economic bids associated with such resources are considered as potential solutions for dispatching around inflexible capacity.

Slide 44:

Calpine remains unconvinced that separate (or any) flexible capacity products are necessary to address the requirements enumerated on this slide. Calpine would appreciate greater analysis demonstrating that these requirements are not satisfied by ongoing RA procurement, or could be with changes to spot markets. In addition, Calpine shares the concerns of many other stakeholders that transacting for four separate flexible RA products could be difficult. For example, it already has proven difficult for non-IOU LSEs to transact for local RA capacity in specific local areas in which the IOUs own or control most or all of the resources. Similar problems could manifest with certain types of flexible RA. For example, given their ownership of hydro and storage, the IOUs likely control a disproportionate share of regulation-capable capacity.

Slides 48-49:

Calpine would appreciate clarification of how the CAISO is conceptualizing coincidence. Ignoring potential energy limits, e.g., the fact that a regulation capable resource may not be capable of sustaining its output for sufficiently long to meet other ramping needs, Calpine believes that the four requirements specified by the CAISO should be nested, i.e., CAISO should have sufficient regulation-capable capacity to meet most or all of its regulation requirements. CAISO also should have sufficient flexible capacity to meet most or all deviations between the FMM and actual, of which regulation-capable capacity will constitute a significant share. Similarly, CAISO should have sufficient flexible capacity to cover most or all deviations between the IFM and actual of which capacity in the preceding two buckets will constitute a significant share.

Calpine does not believe that the CAISO needs capacity to address uncertainty in each relevant time frame equal to the maximum observed deviation in each time frame, i.e., the relevant needs are not the non-coincident needs identified on slide 34. For example, the maximum deviation between the FMM and actual is probably significantly less than the sum of the maximum deviation between RTD and actual and the maximum deviation between FMM and RTD.

Notwithstanding the specific disaggregation of variability and uncertainty that is used to construct flexible capacity requirements, nothing in such a disaggregation actually ensures that the resources that are procured to meet such requirements are available in the time frames that they are intended to address. Ensuring that the right resources, even if they are procured as RA, are actually available in operations likely will require spot market changes.

Slide 52:

Calpine looks forward to more details on eligibility criteria for the four flexible capacity products proposed by the CAISO. On the one hand, Calpine is concerned that the CAISO might limit eligibility to provide various flavors of real-time flexible capacity only to resources that can be committed in real-time, when many other resources are capable of providing the same resources if they are committed ahead of time, potentially at the cost of increasing the Pmin generation that the market must dispatch around. On the other hand, to the extent that the CAISO allows all dispatchable resources, including long-start units, to be eligible to provide real-time flexible capacity, the CAISO may replicate some of the problems with the current flexible capacity product, i.e., that it does not meaningfully differentiate between different types of dispatchable capacity, e.g., OTC units vs. CCGTs and CTs.

Slide 54:

Given the ambiguity about eligibility requirements for the various proposed flavors of flexible capacity, the specifications of the must-offer obligations for different types of flexible capacity should allow for the possibility that certain resources may be eligible to provide real-time flexible capacity products but only capable of satisfying the associated must-offer obligations if they are committed day-ahead.