Comments of the Staff of the California Public Utilities Commission on the CAISO's Flexible Resource Adequacy "Phase 2" Working Group Meeting (July 22nd, 2015)

Submitted by	Company	Date Submitted
Meredith Younghein <u>mly@cpuc.ca.gov</u> ; (415) 703-5953 Michele Kito	Energy Division	08/07/15
Candace Morey	Legal Division	

The Staff of the California Public Utilities Commission (CPUC Staff) appreciate the opportunity to comment on the CAISO's presentation made at the "FRAC-MOO 2" Working Group Meeting on July 22nd. We previously submitted comments on the scope of this initiative, and now we offer comments on the proposal made by CAISO staff at the working group. Preliminary, CPUC Staff would like to reiterate our earlier comments on the working group process. It is unclear to us how the working group can make recommendations for how the product should be changed to be more effective without first understanding CAISO's observations about the current product. Therefore, the development, publication and discussion of analysis should be, over the next few months, the primary function of the working group. Many stakeholders expressed at the last working group that the analysis presented should be made more robust and detailed. More specifically, we encourage CAISO to provide as much available operational data as possible now, and, update this at the conclusion of the year. Sharing this data would allow all stakeholders to benefit from analyzing and learning from the experience as the FRACMOO 2 products are discussed and developed. We also encourage CAISO to conduct cost-benefit analyses that compare different potential solutions to meet operational flexibility needs.

In these comments, we first state our understanding of the proposal to revise how flexible RA requirements are defined and calculated for each month of the year, and then offer our preliminary analysis of the effect of these proposed changes, and our comments on those effects. Next, we discuss the proposed changes to the EFC methodology. Lastly, we provide a series of questions that we hope to discuss at the next working group meeting.

Calculating flexible RA requirements for each month of the year per the CAISO proposal:

Current flexible RA requirements for CPUC jurisdictional LSEs were adopted by the CPUC in D.14-06-050. The current requirement, for each month, is based on CAISO's flexible needs analysis using the largest expected three-hour net load ramp of each month of the year, and the addition of 3.5% of expected peak load. Although the CAISO may also increase the flexible RA requirements to reflect an error term, to date it has not done so.

The CAISO's current proposal, which it presented at the working group on July 22, would not base flexible RA requirements on the largest three-hour ramp of the month. Rather, it would calculate flexible RA requirements for non-summer months (October-April) by calculating the difference between the largest and smallest forecasted net load in each month plus a 15% planning reserve margin (PRM)¹. Or, $N_{Flex} = \{NetLoad_{max} - NetLoad_{min}\} + PRM$, where N_{flex} is the total flexible RA requirement (need). We interpret the proposal to use the absolute lowest and absolute highest forecasted net loads for the month, even though they appear unlikely to occur on the same day, as shown in the CPUC's analysis below. Under the proposal, flexibility needs would no longer be based on a three-hour ramp. In addition, the CAISO would conduct an after-the-fact assessment of the system's "ability to meet maximum one hour ramps" using the flexible capacity showings submitted by LSEs, and would utilize "backstop procurement" (i.e. the CPM) if it found the system to be deficient in one-hour ramping capability.

Rather than having a bundled "generic" and "flexible" RA requirement for the non-summer months, each LSE would have a minimum "flexible" and a maximum "inflexible" capacity procurement requirement. The "inflexible" requirement would be set equal to the maximum load (gross, not net load) minus the non-PRM component of the flexible requirement.² Flexible needs for the summer months (May-September) would be calculated based on the current method, and the system requirements (1-in-2 peak load plus PRM) would remain in effect. The proposal is unclear regarding whether or how the current three categories under FRAC-MOO would be applied to resources submitted to meet the new requirements proposed for the non-summer months.

CPUC Staff's preliminary analysis of the proposal

CPUC Staff conducted a preliminary analysis of how flexible requirements would change under the CAISO working group proposal for all LSEs in the CAISO.³ Our analysis, based on our understanding of the proposal, demonstrates that Flexible RA requirements would increase from between 82% and 170% above the 2016 requirements for the non-summer months (based on the existing methodology and as adopted in D.14-06-050 to apply to CPUC LSEs). Our analysis was conducted using the same data CAISO used in their study of 2016 flexible capacity needs. The results suggest that October would likely have the highest requirement. Details on the calculations and results are shown in the following table. All values are in megawatts (MW).

¹ CPUC Staff assumes that for other LRAs the PRM may be different, and could be less than 15%.

² The CAISO describes the inflexible capacity as set at the minimum forecasted net load plus forecasted VER output at peak.

³ This required making some assumptions regarding the PRM required by other LRAs. For this analysis we assumed that all LRAs required a 15% PRM (as the CPUC does).

Month	Max Net Load (highest of all days)	Min Net Load (lowest of all days)	Max-Min Net Load (over all days)	Peak (Gross) Load in Month	PRM (15% times Peak)
January	32893	17718	15175	33262	4989
February	30829	16553	14276	32038	4806
March	31675	14488	17187	31821	4773
April	33468	12470	20998	33722	5058
May				37268	5590
June				40989	6148
July				45619	6843
August				46941	7041
September				43950	6593
October	35875	13641	22234	37780	5667
November	33605	14581	19024	33788	5068
December	33831	14587	19244	34015	5102
Notes on Columns and Calculations:	Col. 1	Col. 2	Col. 3 (= Col 2- Col. 1)	Col. 4	Col. 5

		Calculation of 2016 RA Requirements Using CAISO Proposal			
Month	CURRENT 2016 Flex RA Requirement	Proposal: New Flex RA Requirement	Maximum Inflexible RA Allowed	System RA (Generic)	% increase in Flex RA Requirement
January	11103	20164	18088		82%
February	10507	19082	17762		82%
March	10362	21960	14635		112%
April	9989	26056	12724		161%
May	7731	7731		42858	-
June	7244	7244		47138	-
July	7935	7935		52462	-
August	7998	7998		53982	-
September	9259	9259		50543	-
October	10331	27901	15546		170%
November	12005	24092	14764		101%
December	12817	24346	14771		90%
Notes on Columns and Calculations:	= max 3-hour ramp in month (CAISO 2016 study)	= 3 + 5 non-summer, current requirement in summer	= 2 + (4-1), non-summer only	= 4+5, summer only	

CPUC Staff also analyzed net load curves for a sample of days in both October and March in order to better understand the impacts of the proposal to utilize the minimum and maximum net load values to determine flexibility needs, regardless of whether they do (or are likely to) occur on the same, or different days. The CPUC Staff's analysis shows that it is unlikely, at least based on October and March samples evaluated, that the minimum and maximum loads will occur on the same day of the month.

Using October as example month (Figure 1): the day with the lowest minimum net load (purple line) also has a very low maximum (under 14,000 MW), while the day with the maximum net load (red line) has a much higher minimum net load (just over 20,500 MW) and a much different load profile – one that is more typical of a summer peaking day, rather than a "duck" load shape.



Figure 1. October 2016 net load curves

This illustrates that the maximum ramping range the CAISO proposal would require to be met with flexible RA would not actually occur on the system. Rather, the maximum ramping day, as defined by $NetLoad_{max} - NetLoad_{min}$ on any *single* day in October is 16482 MW (not limited to a three-hour continuous ramp). This is 11,419 MW less than what the CAISO proposal would require for flexible RA in October as shown in Table 1.

We also evaluated net load curves using March as an example (Figure 2) because it is a month on which CAISO bases the "duck curve." This figure also illustrates that the proposal would result in flexible RA requirements that exceeds any actual total ramp that is expected to occur on the system, because the day with the highest net load has a much higher corresponding minimum net load compared to the minimum net load to occur on any day of the month. The CPUC Staff is concerned with this aspect of the proposal.





Furthermore, adding the Planning Reserve Margin to the flexibility requirement, which is established by CPUC policy to represent an "insurance policy" for the state to ensure adequate capacity procurement generally, does not seem necessary or justified. The PRM should not be part of calculating operational needs in a given month, when in fact this "margin" is meant to be an annual calculation to provide assurance that the state could meet its peak need for generation under a worst-case scenario. Adding the PRM to current requirements would represent an unjustified increase that is unrelated to flexible needs.

CPUC Staff requests additional explanation for why the CAISO is moving away from viewing flexible RA as a three (or even four) hour product. Whereas the development of the current flexible RA requirements was aimed at ensuring that CAISO system could meet the maximum potential ramp over a 3 hour period, the current proposal seems almost completely aimed at reducing likelihood of over-generation, not the need for ramping. There are many tools available to reduce the likelihood of over-generation, including market-based tools such as negative pricing events. CPUC Staff encourages CAISO to reconsider the role of the day-ahead and real-time energy market to mitigate potential over-generation concerns, which seems more effective and appropriate compared to a year-ahead resource adequacy requirement.

EFC Calculations:

The proposal states that EFC's for resources would be calculated based in part on the resources Pmin. Pmin would only count as flexible under certain conditions. Resources with the following characteristics would not be given an EFC:

- o Start up time more than 90 minutes
- Minimum run time more than 4 hours
- Minimum down time greater than 4 hours

CPUC Staff's preliminary analysis indicates that the resulting change in EFC values would be in a \pm 2% range. Therefore, we conclude that these proposed changes would not measurably change what capacity qualifies as flexible, and therefore the proposal is unnecessary.

Questions about this proposal, to address in future working group meetings:

- Is the goal of Flexible RA requirements to support ramping needs or to address over-generation?
- How can ensuring capacity availability help with downward ramping needs? These two concepts seem disconnected.
- Why aren't the tools in CAISO's current toolbox of market and operational mechanisms sufficient to deal with over-generation?

Calculation of monthly requirements:

- Do the current 3 FRAC-MOO categories still apply to all months? Or just the summer months?
- Why should the PRM be added on to the Flexible requirement? Isn't PRM strictly a generic "insurance" type requirement?
- Will the same method and data sources used to arrive at the current Flexible needs be used to calculate the minimum net load and maximum gross load be determined? Or, will additional modeling tools be used to forecast the likelihood of those values occurring, and occurring on the same day?
- How should 3 hour ramping needs be modeled and understood in the medium term? These have been modeled in the LTPP proceeding, but only beginning at 2024. To date no modeling has been done to understand needs between 2015-2024.
- It is unclear what the implication would be for "system" capacity needs for the non-summer months, would "system" RA requirements in their current form not exist for those months? What would the implications be for current contracts held by the LSEs for significant system capacity in the non-summer months that cannot meet the definition of flexible capacity?

EFC Calculation:

- Would this proposal to modify EFC calculations apply to 12 months during the year, or only to the non-summer months?
- Regarding how the number of starts per day affects the category of flexible capacity: is this only for summer months?
- What does the proposed EFC method mean for capacity (RA) values of RPS resources? What about thermal storage? DR?