

Flexible Resource Adequacy Criteria and Must Offer Obligation Phase 2 Revised Draft Framework Proposal

Comments by Department of Market Monitoring
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Summary

DMM appreciates the opportunity to provide comments on the Flexible Resource Adequacy and Must Offer Obligation (FRAC-MOO) Phase 2 Revised Draft Framework Proposal.¹ The proposal offers improvements over the initial FRAC-MOO design. DMM supports the ISO's continued efforts to improve flexible capacity procurement. DMM provides comments on specific aspects of the ISO's proposal below.

Real-time must offer obligation

The ISO proposes flexible resource adequacy products for the day-ahead market, the 15-minute market (FMM) and the 5-minute market (RTD). For the real-time flexible resource adequacy products, the ISO proposes to maintain the current FRAC-MOO requirement that resources bid into the real-time markets. The resource adequacy (RA) processes are meant to ensure there are sufficient resources available to the day-ahead market to meet the reliability needs of the upcoming trading day. The day-ahead market uses all the resources available to it (RA or not) to ensure that the real-time market needs are met. Currently the day-ahead market does not have a mechanism to ensure sufficient flexible capacity is available to the real-time markets. Therefore it would appear reasonable to give flexible RA capacity a real-time must offer obligation to cover this potential shortfall in the day-ahead procurement.

However, the ISO is now developing a day-ahead imbalance reserve product to procure additional flexible capacity for the real-time markets.² The ISO has not fully specified the design of the imbalance reserve product, but the imbalance reserve product will also give resources the obligation to economically bid into the real-time market.³ The ISO should carefully consider the design of the real-time must offer obligation for flexible RA resources together with the design of the day-ahead imbalance reserve product, and ensure that the incentives and requirements for these two market design features are clear and are complimentary.

¹ *Flexible Resource Adequacy and Must Offer Obligation Phase 2 Revised Draft Framework Proposal*, CAISO, January 31, 2018:

<http://www.aiso.com/Documents/RevisedDraftFlexibleCapacityFrameworkProposal-FlexibleResourceAdequacyCriteria-MustOfferObligationPhase2.pdf>

² *Day Ahead Market Enhancements Issue Paper/Straw Proposal*, CAISO, February 28, 2018:

<http://www.aiso.com/Documents/IssuePaper-StrawProposal-DayAheadMarketEnhancements.pdf>.

³ See Appendix C of the Day Ahead Market Enhancements Issue Paper/Straw Proposal, p. 27.

Use of schedule differences

The ISO proposes to set the real-time flexible RA requirements based on differences between market schedules. Figure 1 on the next page shows what DMM thinks the ISO proposes. The blue lines are the forward market's schedules and the green lines the next market's schedules. The dots are the schedule mid-points. Here we draw the blue forward market as the FMM and the green market as the RTD. The ISO proposes to calculate differences between the green RTD schedules and the blue FMM schedules. For example, this distance is labeled 'A' in Figure 1. However, this schedule difference does not represent the difference in ramping capability between the FMM and RTD markets.

The FMM and RTD markets set up resources to ramp between intervals. This means that the markets ensure that there is sufficient ramping capability to at least meet the average expected net load ramp between intervals. Figure 2 shows the average FMM and RTD ramps between intervals as the linear change between interval mid-points. Between FMM intervals 2 and 3, the FMM net load ramp is B, and the average 5-minute net load ramp is B divided by three. But in the RTD the net load ramps can be different than the average 5-minute FMM ramp. For example C is a faster 5-minute RTD ramp than the average FMM 5-minute ramp and may not be feasible given the FMM schedules (without procuring additional flexible capacity). Therefore, it seems that the relevant data to consider when determining the flexible RA requirements is the difference between the average 5-minute FMM ramp and RTD ramps, i.e. compare C to B-divided-by-three. A similar calculation could be done for the difference between average 15-minute day-ahead and FMM net load ramps.

Looking at the differences in ramping needs would seem to be consistent with the day-ahead flexible RA product design. The day-ahead flexible RA product's goal is to ensure sufficient flexible capacity to meet the 3-hour ramp. The real-time flexible RA products should ensure sufficient flexible capacity is available to cover net load ramp rates that are faster than the average 3-hour ramp rate but occur over shorter time frames. Measuring the net load ramps and net load ramp differences between markets seems to be the correct measurement. While it is unclear how to convert these measurements into flexible RA requirements, the requirements proposed by the ISO do not appear to quite align with actual ramping needs.

Figure 1. Difference between market schedules

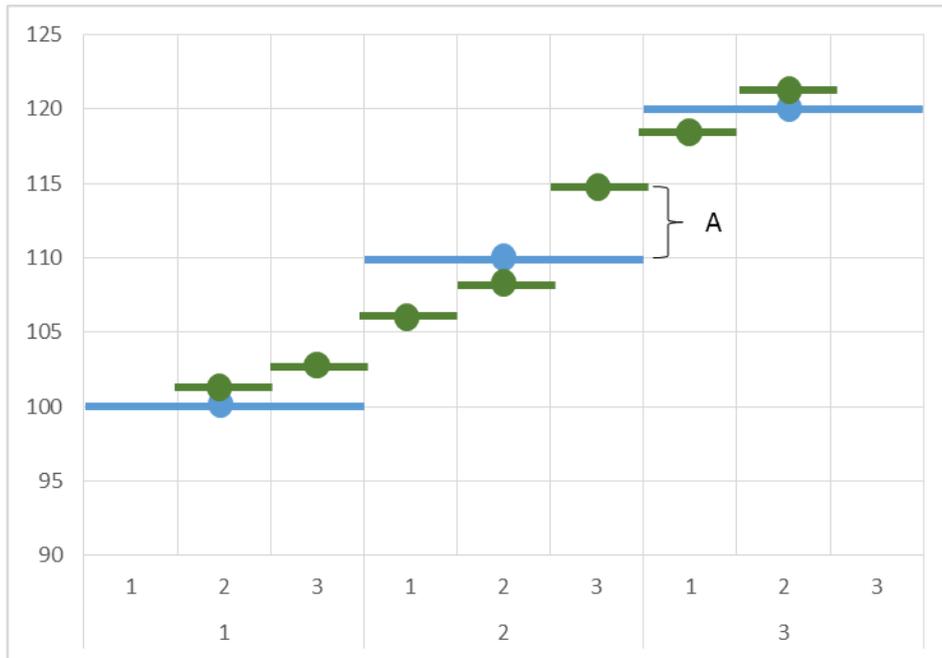
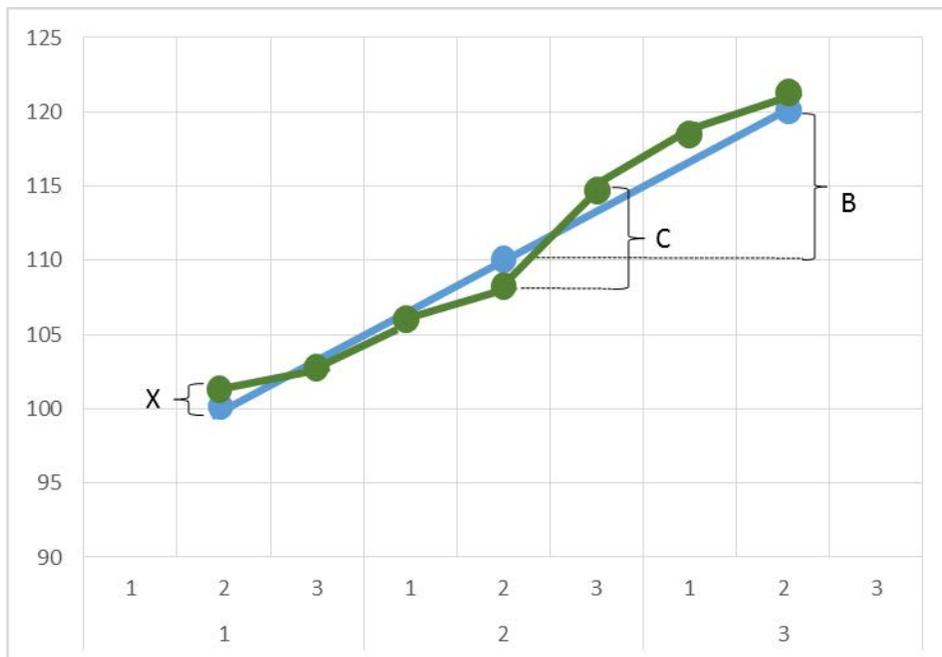


Figure 2. Difference between market net load ramps



Day-ahead requirement and epsilon term

As explained in the proposal, total operating reserve requirements are approximately equal to the maximum of (1) the Most Severe Single Contingency (MSSC) and (2) 6% of expected peak load. About half of this total reserve requirement is met by spinning reserves. The ISO proposes a flexible RA day-ahead requirement of:

$$\text{Maximum forecasted 3-hour ramp} + \frac{1}{2} * \max(\text{MSSC}, 6\% \text{ expected peak load}) + \epsilon$$

The ISO justifies using half the reserve requirement as part of the flexible RA requirement by stating that half of the reserve requirement is met by spinning reserve. DMM does not understand this justification. Both spin and non-spin resources can provide flexible capacity. It seems both spin and non-spin requirements would compete for resources that could otherwise be used to provide flexible capacity. DMM encourages the ISO to clarify why the ISO proposes to use half the total reserve requirement in its flexible RA requirement.

DMM also does not understand what the epsilon term is. How is this epsilon calculated?

Eligibility criteria

DMM continues to think it is unclear why the ISO proposes to limit the ability of resources to provide flexible RA capacity based on fairly restrictive start-times.⁴ For example, as Calpine pointed out, limiting day-ahead flexible RA product eligibility to resources with cold start-times of 90-minutes or less does not align with the day-ahead market which can commit and dispatch resources with longer start times to meet net load and net load ramps.⁵ The ISO wants to use the start-time criteria "...to manage the Pmin burden of long start resources." But the proposal does not offer any support for how this start-time criteria will help the ISO efficiently manage the tradeoff between the need for ramping capability and the megawatts of Pmin that each flexible resource could add. The start-time criteria assumes that a resource with a longer start time is not valuable no matter how much high ramp rate flexible capacity it can provide.

⁴ *Comments on the 2nd Revised Straw Proposal for Flexible Resource Adequacy Criteria and Must-Offer Obligation*, Department of Market Monitoring, August 28, 2013, p. 6:

<http://www.caiso.com/Documents/DMMComments-FlexibleResourceAdequacyCriteriaMustOfferObligation-SecondRevisedStrawProposal.pdf>.

⁵ *Stakeholder Comments on FRACMOO2-Draft Framework Proposal*, Calpine, December 13, 2017, p. 4:

<http://www.caiso.com/Documents/CalpineComments-DraftFlexibleCapacityFramework.pdf>.