# *California Public Utilities Commission*

## Flexible Ramping Products Incorporating FMM and EIM
## Straw Proposal June 2, 2014

| Submitted By | Company or Entity | Date Submitted |
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**Summary**:

The ISO's straw proposal for Flexible Ramping Products (FRP) is designed to develop market-based flexible ramping products to address the operational challenges of maintaining power balance in the real-time dispatch. At this time the ISO proposes to restrict resource adequacy (RA) resources to a zero bid price for flexible ramping and allow non-RA resources to explicitly bid their flexible ramping into the day ahead market (DAM). The ISO proposes to allocate costs of FRP to load, supply and imports that drive the variability and need for the FRP. Further allocation within each of the major categories will be done based on each resources proportional contribution to the variation[1]. The ISO proposes to exempt resources that manage their variability to stay under +/-3% of their schedule.

Staff welcomes this opportunity to comment on this initiative. In general the CPUC Staff supports the CAISO proposal for the FRP. Specifically, Staff supports the ISO's proposal setting the FRP offers at zero for resource adequacy (RA) capacity in the day ahead market as well as deny FRP offers for all resources in the real time markets. Staff does not support the ISO's proposal to allow non-RA market participants to bid FRP offers in the day ahead market. Additionally, Staff recommends that the ISO eliminate the proposed tolerance band of +/- 3% within the supplier cost allocation methodology to exempt allocation of FRP costs and instead allocate costs based solely on their proportional contribution to the variation.

[1] Load would be alloated on a load ratio share.

**Background:**

The ISO has observed that the fleet of units committed in real-time sometimes lacks sufficient ramping capability and flexibility to handle the 5-minute to 5-minute system load and supply variability. Sometimes the insufficient ramping capability manifests itself by triggering power balance violations, which means the there is no feasible system wide real-time dispatch to maintain the supply and demand power balance.

According to the ISO, in the case of power balance violations, undesirable outcomes include:

- The system has to rely on regulation services to resolve the issue in real-time after the imbalance has caused frequency deviation or area control error (ACE).
- When power balance is violated, the RTD energy price is not priced by economic bids, but by administrative penalty prices. Administrative pricing creates market inefficiency in the long run and results in using the high penalty price for the imbalance energy of resources providing regulation services.
- If there is insufficient regulation service, the system must lean on the interconnection with other Balancing Authority Areas, potentially impacting the CAISO system to meet required operational performance criteria.

Since the new nodal market was implemented in 2009, the ISO has had a multi-interval optimization in the unit commitment and dispatch process. The multi-interval optimization can look several intervals ahead to meet forecasted ramping needs. The flexible ramping product is to create ramping margin on top of the forecasted ramp between market intervals, and thus reduce the frequency of power balance violations.

**Detailed Comments:**

**FRP Bidding Rules – No resource should be allowed to bid FRP in the day ahead market or real-time markets and economic energy offers should be the sole basis for determining the opportunity cost in all three markets (DAM, FMM and RTD).**

During the stakeholder meeting on June 9th the CAISO asked whether explicit bidding of Flex Ramping Product (FRP) be allowed. If so, should bidding be limited to non-resource adequacy suppliers or apply to all suppliers including resource adequacy (RA) resources?

In the straw proposal RA resources would not be allowed to bid/offer FRP in the Day Ahead Market (DAM) where the ISO would reflect a zero FRP bid for RA resources[2], and allow non-RA resources to explicitly bid/offer FRP in DAM. The FRP bids/offers are

[2] In the Flexible Resource Adequacy Capacity Must Offer Obligation (FRACMOO) initiative flexible RA capacity will be required to economically bid in their energy offers in the Integrated Forward Market (IFM).

supposed to represent opportunity costs and be coupled with economic energy offers from non-RA resources.

CPUC Staff believes the ISO should not allow explicit bidding of FRP opportunity cost for any resource in the DAM. Allowing FRP opportunity cost bidding by any market participant creates an additional layer of market complexity which would require additional market monitoring and market power mitigation schemes to prevent market abuse.

Another problem with bidding in FRP costs is that they could be bid in up to the cap (same cap as for Ancillary Services) and though the bids should represent opportunity costs, there is no restriction on what the bids could represent or why.

Should the CAISO allow day-ahead explicit FRP offers there may be an increased likelihood for pricing games between energy and FRP offers(e.g. the ability to change energy offers in real-time which may impact commitment and dispatch of flexible ramping, and the use of bidding strategies using FRP with energy offers to game bid cost recovery).

Denying FRP bids by non-RA resources in the day ahead market is consistent with the ISO proposal that denys explicit bids for FRP in the Fifteen Minute Market nor the five minute Real Time Dispatch. The economic energy offers should be the sole basis for determining the opportunity cost in all three markets (DAM, FMM and RTD).

Therefore, Staff strongly recommends that ISO disallow explicit bids/offers for FRP in the day ahead market for all resources.

**Cost Allocation – Eliminate the +/-3 % threshold for supplier cost allocation.**

The ISO proposes to initially allocate the costs for the flexible ramping product based upon load, supply and import/export movements that results in changes in real-time dispatch of resources. With the introduction of the FERC Order No. 764 market design changes, the ISO modified the settlement interval from ten minutes to five minutes. Movement for load is defined as changes in observed load every five minutes. Movement for supply is defined as the combined changes in uninstructed imbalance energy and change in internal self-schedules every five minutes. Movement for static intertie ramps is calculated based upon the change in MWhs deemed delivered every five minutes. The ISO believes that movement is better aligned with the procurement decisions of the flexible ramping product because the movement represents the changes in real time dispatch (RTD) necessary to manage the system.[3]

[3] Ibid. pg. 32.

The CAISO plans to establish three FRP cost buckets for each of Load, Supply and Fixed Ramp (e.g. static intertie ramps) which will be allocated based on the billing determinants for each category.

Under the ISO's proposal, the cost allocation mechanism for the supply category allocable costs will be based on the combined changes in uninstructed imbalance energy and change in internal self-schedules every five minutes. The proportionate share for supply would then be allocated to those supply resources who fall outside of a +/- 3% tolerance band. The CAISO explains that a 3% tolerance band is justified because "it would recognize that perfect adherence to dispatch is not realistic based on resource operational characteristics."[4] However, it appears that by introducing a 3% tolerance band some resources will be absolved from paying any FRP costs (even though the resources' deviations were included in the allocation of cost to the supply bucket). This appears to place a disproportionate burden on resources whose operating characteristics may prevent them from meeting this +/- 3% threshold.

Thus, it would seem discriminatory and unfair to use a tolerance band at all, especially because it would be "unrealistic" to expect perfect adherence to ISO dispatches and everyone would be contributing to the allocable FRP costs in the supplier bucket. For example, based on the proposal it appears that if a large resource with a 500 MWs of capacity has a deviation of 1% and another resource of 50 MW's has 4% deviation creating 5MWs and 2MWs of FRP procurement respectively, the current proposal absolves the larger resource that created 5/7ths or 71% of the FRP costs. The remaining costs in the supply bucket would be allocated entirely (in this example) to the resource that created only 29% of the FRP costs.

CPUC Staff thinks the equitable way to allocate costs would be proportionate share of deviation without applying any tolerance band and recommends that the ISO eliminate the tolerance band from the proposal for allocating costs within the supplier category. By ratably allocating the costs all resources would bear their proportionate share of the costs. A tolerance band only creates a threshold that incents resources to only cross that line. Because there is no reward for doing better than +/- 3%, generation resources have no incentive to reduce their deviations any further.

**Clarify flexible ramping market power mitigation when bidding allowed.**

In this proposal the ISO did not include any discussion of Market Power Mitigation. The ISO's proposal does not[5] address the market power mitigation that would be needed

[4] Ibid. pg. 37.

[5] "The ISO believes that the real-time pure opportunity cost pricing, the day-ahead **implicit** flexible ramping offer from economic energy offers, and flexible ramping demand curve (discussed later) should adequately address the concern of market power given the current volume of procurement. Therefore, the ISO will not propose any market power mitigation mechanism at this stage." http://www.caiso.com/Documents/StrawProposal_FlexibleRampingProduct.pdf, Pg. 10

should day-ahead **explicit** flexible ramping offers be used in the DAM. We do not support explicit bidding of FRP in the DAM, though should the ISO go down the path allowing explicit FRP bids in any of its markets, then it appears that the Local Market Power Mitigation (LMPM) burden could be significant.

The CAISO proposal has no provision for market power mitigation because the proposal relies on an optimization driven calculation of the FRP opportunity costs based on the resource's energy offers. Explicit bidding in day-ahead or real-time under the currently proposed market design would create additional market power concerns due to the potential for price manipulation created by the dynamics between energy and opportunity cost offers between each other and between bid cost recovery, energy and opportunity costs.

Therefore, if explicit FRP offers continue to be a feature of this proposal, then Staff strongly recommends the ISO perform a thorough analysis on the potential for market manipulation, and impacts on bid cost recovery, economic withholding, and energy price formation. The analysis should inform stakeholders of the potential for perverse outcomes and provide practical mitigation strategies.

**Explain differences in flexible ramping requirement and demand curve.**

Because the ISO plans to use minimum and maximum constraints to establish a day-ahead procurement requirement for upward and downward FRP, Staff would appreciate more examples to help clarify how the upper and lower requirement limits will be determined. Also, examples should be provided which outline the methods for establishing (explain any differences between methods) the FRP procurement requirement in day-ahead (in hourly intervals) versus in real-time (5 minute intervals).

**Explain and provide examples for impact of FRP on Residual Unit Commitment procurement.**

Though the ISO had previously proposed to integrate the Residual Unit Commitment (RUC) process and integrated forward market (IFM) into a combined day-ahead market optimization, it appears the RUC and IFM integration will be delayed until 2015 due to implementation complexity with the initial implementation of the flexible ramping product.

Because they will not be implemented together CPUC Staff is concerned that the FRP procured in the day-ahead market will not be adequately considered in RUC which may result in over or under procurement of physical capacity for real-time dispatch by the RUC process.

Because it is unclear in the proposal how this will be addressed, Staff requests the CAISO to explain how RUC will consider the FRP commitment in the day-ahead market and provide examples of how different levels of FRP commitment will increase or decrease the RUC procurement levels in the next iteration of the proposal.

**Conclusion:**

The Flexible Ramping Product initiative has many positive features and CPUC Staff would like to commend the CAISO and its Staff for putting together a comprehensive and thoughtful proposal for this very complex market feature. In general, the CPUC Staff supports the CAISO proposal for implementing Flexible Ramping Product (FRP) in the market.

However, at this time Staff recommends that no resource should be allowed to bid FRP in the day ahead or real-time markets and economic energy offers should be the sole basis for determining the opportunity cost in all three markets (DAM, FMM and RTD). Staff also recommends elimination of the supplier tolerance threshold for cost allocation within the supplier's FRP cost bucket and proposes that all suppliers should be allocated costs based solely on their proportionate share of the supplier costs bucket.

In addition, there are several areas of the proposal in need of additional explanation or examples to help market participants understand how the proposal will ultimately work.

1. Clarify and explain what market power mitigation processes and procedures would be warranted should the CAISO proceed with allowing explicit bidding of FRP in the day-ahead market.
2. Provide explanation for any differences between the procurement requirements for day-ahead and real-time (FMM and RTD) markets.
3. Provide explanation whether the amount of FRP commitment in the Integrated Forward Market will affect the Residual Unit Commitment (RUC) procurement amount, and provide examples of how it impacts the RUC.