

## Flexible Ramping Product Initiative Stakeholder Comments Matrix – Revised Draft Technical Appendix

Topic	Stakeholder	Comment	ISO Response
Market operators ability to bias FRP	Powerex	Powerex requests that the ISO confirm whether ISO market operators will have the authority to bias the flexible ramping requirement. If so, Powerex further requests that the ISO take steps to ensure the transparency of this practice, including memorializing this authority in the CAISO Tariff or BPMs, and providing for ongoing and regular disclosure of the frequency of such adjustments and the reasons for use of this authority. The ISO could consider posting each instance in which market operators made such adjustments as well as the reasons for those adjustments on an ongoing basis.	Operators will have the ability to override the requirements when inconsistent with actual system conditions. The ISO will continue to look into opportunities to improve transparency.
	WPTF	WPTF understands that the ability to bias FRP procurement is likely a necessary feature of the market optimization; however, we strongly request that both the FRP bias Operating Procedure and any instances of FRP bias be made transparent.	Same as above
Allocation of uncertainty	Powerex	Does the ISO propose to allocate the cost of FRU and FRD for uncertainty based on the average quantity of the billing determinant, or based on some other measure of it (e.g., maximum, or 95th percentile)? While it is the potential for “outlier” outcomes that drives the amount of FRU and FRD to address uncertainty, the average error quantity may be the most appropriate initial approach as it mitigates the risk of volatile uplift charges for the Flexible Ramping Product. This may be revisited as a future enhancement in light of actual data.	The ISO will allocate the cost of uncertainty to the pro-rata share of the sum of the individual resources’ billing determinant divided by the total of all resources’ billing determinant.

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	DMM	Allocating the uncertainty portion of FRP costs based on generator UIE can cause generators to pay for FRP that the generators did not cause to be used and which was not procured in the market.	The ISO believes that while there are differences between the binding interval (UIE) and meter, this is not the same as differences between the binding interval and advisory interval (uncertainty in net load), we do believe that UIE is an indirect driver of ramping and is therefore appropriately allocated a portion of the supply category costs.
Revision to examples	Powerex	Powerex believes that the example provided in Table 11 of the Revised Technical Appendix may contain errors. Specifically, it appears that the table is intended to represent an intertie schedule ramping from a value of 100 MW during HE 2 to a value of 150 MW during HE 3. Consistent with WECC interchange standards, the ramp between the two hourly values will occur over a 20-minute period beginning at 01:50 (i.e., at the start of RTD 11 of HE 02) and concluding at 02:10 (i.e., at the end of RTD 2 of HE 03). This means that the schedule will increase by 12.5 MW during the course of each of the four 5-minute intervals. Table 11, however, shows values for the “prescribed hourly ramp” that increase by 10 MW in each 5-minute period, which would be inconsistent with this ramping procedure. Additionally, the “RTD incremental ramp award” values appear to imply that the intertie ramps by 10 MW during	The ISO thanks Powerex for the revision to the example provided in Table 11 of the Revised Technical Appendix. The ISO has included the revision to the table in the Revised Draft Final Proposal.

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		RTD 10 of HE 02, which would occur before the prescribed start of the schedule ramp at the beginning of RTD 11.	
Virtual bidding	SCE	SCE cannot not support the proposal until the ISO first demonstrates virtual bidding functions efficiently within the FRP design.	The ISO brought the topic up for discussion in the December 11, 2015 Market Surveillance Committee meeting. The MSC did not see how the FRP design would not improve upon the constraint currently implemented.
Locational component in FRP procurement	SCE	As SCE has stated in the past, SCE would support even a simple proposal such as using the existing Ancillary Services (AS) regions. Without a locational component, the ISO may buy FRP that gets stranded due to congestion, and the FRP is unable to serve the need for which it was procured. This will lead to the ISO likely increasing procurement targets for the affected areas. Such an outcome would be unreasonable and inefficient.	The ISO has made the decision to make incremental improvements to the constraint. Additionally, the locational procurement within a balancing authority area will increase the complexity of the implementation.
Uncertainty procurement	SCE	Any methodological flexibility with uncertainty procurement should be capped at the demand curve.	The ISO will always procure uncertainty with the demand curve.
Additional FRP procurement	WPTF	The ISO proposes that in addition to the real ramping requirement, the ISO must also procure sufficient ramping to account for known fixed and discontinuous dispatches (e.g. start-up instructions, MSG resource transitions, exceptional dispatches).	The net demand movement is calculated before the market solution, therefore including known commitment decisions in the net demand will not alter the optimal solution.

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		<p>Because the FRP requirement is co-optimized with the energy requirement, would the market potentially dispatch a more expensive resource without a transition times if it meant lowering the flexible ramping requirement MW amount?</p> <p>Perhaps the ISO might simply consider adding a fixed value to the uncertainty based on the outcome of the optimization without the additional fixed and discontinuous dispatch requirement.</p>	<p>The ISO will not increase the uncertainty.</p>
Additional data	WPTF	<p>It would be helpful for the ISO to provide summary statistics and an analysis on how well the forecasted movement is compared to reasonable expectations and operator needs. It would also be helpful to compare the forecasted movement and uncertainty (flexible ramping product requirement) to the current flexible constraint requirement.</p>	<p>The ISO believes that the histogram of forecast errors provided through the demand curve, which will be available for stakeholders, will be sufficient in comparing forecasted movement to reasonable expectations and operator needs.</p> <p>Additionally, calculation of the requirement is not comparable to the current flexible constraint requirement.</p>
	PG&E	<p>PG&amp;E requests that the ISO track and report on impacts of several effects (e.g., generation resource start up and shut down, updates in Variable Generation Resources (VER) forecast). Such information will help the ISO and stakeholders evaluate the performance of the</p>	<p>The ISO updated the capacity constraint formulation in the Draft Final Proposal and will continue to monitor the performance.</p>

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		design and the possible need for incremental future improvements.	
Granularity differences	DMM	As the ISO showed, there are granularity differences between procuring 15-minute FRP in the FMM and 5-minute FRP in RTD. These types of granularity differences also exist in the current energy market. While DMM does not believe these granularity differences merit changing the FRP design at this time, the ISO should be prepared to deal with issues arising from the granularity differences, including turning off the FRP in either the FMM or RTD if necessary.	The ISO agrees with DMM’s observation of granularity differences between procuring FRP in the FMM and RTD.
Payment rescission	Powerex	Table 13 includes a “Generator 2” with a 50 MW FRU award for uncertainty and 900 MW FRU award for forecast movement. The text explains that “The meter showed that Generator 2 produced 75 MW which is 25 MW more than the awarded uncertainty, in which 25 MW will be charged to the generator as a payment rescission.” Powerex believes the text should read that the meter for Generator 2 showed it produced 975 MW (not 75 MW). In this case, the meter would show that Generator 2 produced 75 MW more than the expected 900 MW of its energy schedule, consistent with Table 13. Powerex agrees that this example implies that the 50 MW of capacity awarded as FRU for uncertainty was not actually provided, and rescission of that payment is appropriate. However, Powerex does not believe that rescission of 25 MW of	The intent of this rule is to avoid double payment of ramping capability in the binding interval. This occurs because UIE is settled at the RTD price which includes the ramping cost paid to resources providing ramping to the next interval. The ISO believes that the same double payment exists in both movement and uncertainty and must be treated the same.

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		<p>FRU for movement is warranted. The award for 900 MW of FRU for movement was fully satisfied; rescission for movement would be appropriate if Generator 2 showed output of less than 900 MW, but that is not the case here. The additional 75 MW produced in this example are more properly considered and settled as uninstructed imbalance energy (with 50 MW subject to rescission, as discussed above). Under CAISO’s proposal, this uninstructed energy will increase the Scheduling Coordinator’s allocation of the costs for FRD for uncertainty in the monthly allocation process.</p>	