

Comments on Flexible Ramping Product Draft Final Proposal

Submitted By	Company or Entity	Date Submitted
Gifford Jung 604-891-6040	Powerex Corp.	April 23, 2012

Powerex appreciates the opportunity to provide these comments on the development of this important new product. Powerex is strongly supportive of the CAISO's need to develop the Flexi-Ramp product. The Flexi-Ramp product will provide the CAISO with the ability to acquire, in its IFM and real-time markets, additional 5-minute ramping capacity, to ensure that there is sufficient 5-minute energy available to be dispatched to meet CAISO's intra-hour variation and uncertainty needs, down to 5-minute granularity. Powerex also understands that regulating reserves will continue to be utilized to meet the CAISO's ramping capacity needs within each 5-minute interval.

Powerex believes that the Flexi-Ramp product will quickly become a core element of the CAISO's market in the years ahead, as the CAISO's need for intra-hour ramping capacity grows with the continued integration of variable energy resources. Accordingly, taking the time to ensure that this product is properly designed from a product procurement, settlement structure, and cost allocation perspective is essential to CAISO's core objectives of achieving efficient market outcomes and maintaining reliability. Moreover, the complexity of the Flexi-Ramp Product procurement processes, settlement structures, and cost allocation require that appropriate consideration and stakeholder discussions take place.

For these reasons, Powerex strongly urges the CAISO to slow down this stakeholder process, by at least 3 months. The CAISO currently has implemented the Flexi-ramp constraint to meet its near-term intra-hour ramping capacity needs, and therefore has no known urgent need to rush this important stakeholder process.

On the current "Draft Final Proposal" for the Flexi-Ramp Product, Powerex provides the following comments:

Flexi-Ramp Product Procurement

Powerex is not convinced that the CAISO's flexi-ramp procurement framework is the most efficient available. Powerex recognizes that it may not fully understand the CAISO's complex Flexi-Ramp procurement algorithms, however, the information provided to date suggests that the CAISO may not have fully considered the fundamental differences between *variation* and *uncertainty* that drive its Flexi-Ramp procurement processes. Thus, Powerex requires more information and examples on the Flexi-Ramp procurement processes before providing more comprehensive comments.

Flexi-Ramp Product Settlement

Powerex also requires additional information on the settlement framework for the Flexi-Ramp product, including more examples, before providing detailed comments on the Flexi-Ramp Product settlement framework. Nonetheless, Powerex's greatest concern at this time, regarding the proposed settlement framework, is whether there are sufficient incentives created to

encourage participants to provide substantial Flexi-Ramp product “mileage”. In other words, will those parties that are dispatched to provide energy and hence ramping, be compensated sufficiently over those that are not dispatched for energy.

Flexi-Ramp Product Cost Allocation

On cost allocation, Powerex is supportive of the CAISO’s objective to allocate costs for the Flexi-Ramp product consistent with its cost allocation principles. However, Powerex believes the CAISO’s current cost allocation proposal for the Flexi-Ramp product largely fails to achieve this important objective. In contrast, Powerex believes the CAISO’s cost allocation proposal for the Flexi-Ramp product directly and materially violates several of the CAISO’s cost allocation principles including: cost causation, comparable treatment, accurate price signals, and incentivizing behavior. Powerex provides detailed comments on the CAISO’s cost allocation as follows.

Variances and Uncertainties should be treated differently in the cost allocation process

Powerex believes it is important to recognize that **variance** and **uncertainty** are very different drivers of the Flexi-Ramp product requirement, thereby necessitating distinct and separate treatment within the cost allocation process.

Variance – Defined herein as the difference between a resource/load’s modeled 5-minute award in the IFM market, and its expected 5-minute performance, measured at the time of the Flexi-Ramp Product real-time procurement decision.

Uncertainty – Defined herein as the expected maximum deviation (with a significant degree of confidence) between a resource/load’s expected 5-minute performance and actual 5-minute performance, measured at the time of the Flexi-Ramp Product procurement decision.

In other words, **variances** drive a need for a specific quantity of either 5-minute upward ramping capacity or 5-minute downward ramping capacity to meet a **known energy requirement** for that 5-minute interval only. In contrast, **uncertainties** drive a need for an insurance quantity of 5-minute upward ramping capacity and/or 5-minute downward ramping capacity to meet a **potential energy requirement** in every interval in which uncertainty exists, regardless of whether such deviation from expectation actually occurs.

This critical difference leads to a necessity for **variances** and **uncertainty** to be treated differently, in the cost allocation process, for several reasons.

First, variances in one direction can reduce the need for Flexi-Ramp in the opposite direction, whereas uncertainties cannot. For example, if the CAISO requires 1000MW of Flexi-Ramp Up to cover a known 15-minute upward variance in load, then any other variance upward (i.e. a known increase in solar output or HASP intertie deliveries) will reduce the need for Flexi-Ramp Up in that interval. Therefore, it is critical from a cost causation principle that when allocating costs to variances that drive increased Flexi-Ramp procurement that equal consideration be given to allocating credits to variances that reduce Flexi-Ramp procurement.

Second, any variances relative to a participant’s IFM award, represented in 5-minute intervals, may drive a change in the need for ramping that alters the Flexi-Ramp Procurement decision. For example, consider the following scenario. CAISO Load is expected to require 2,000MW of ramping up capability, but there is sufficient upward ramping capability to meet the intra-15 minute interval requirements, provided by fast-ramping internal generation resources offering RTD INC energy. No Flexi-Ramp Up or Flexi-Ramp Down will be needed for known variances within each 15-minute interval, all else equal. Now, consider a large HASP intertie export consumes the existing internal generation flexibility, and the CAISO subsequently has to

purchase 2,000MW of Flexi-Ramp Up. Powerex argues that the HASP export has driven the Flexi-Ramp Up procurement decision as much as the CAISO load increase.

For this reason, Powerex believes the baseline for measuring variances should be the SC's IFM modeled 5-minute awards, and should be consistent across all demand and resource types. The variance should therefore be measured as the final 5-minute expected quantity at the time of the real-time Flexi-Ramp procurement decision, compared to the 5-minute award modeled in the IFM optimization model for the same resource / demand schedule

Third, uncertainties require Flexi-Ramp Up and Flexi-Ramp Down in every interval, regardless of whether the uncertainty manifests itself in an actual deviation from expected 5-minute performance. For this reason, deviations resulting from uncertainties are generally much more costly from a ramping capacity perspective than deviations resulting from variances. This cost is mitigated, to some extent, by diversification, provided, such uncertainty is driven by physical factors such as variable resource output, load forecast error, etc. Uncertainty caused by a participant's economic choice not to perform cannot be presumed to be diversifiable and hence requires 100% ramping capacity to backstop every interval.

For these reasons, Powerex recommends that the CAISO consider incorporating the following into the Flexi-Ramp Up and Flexi-Ramp Down procurement and cost allocation processes:

- 1) Calculate the overall 5-minute ramp-up and ramp-down quantity requirement and cost allocation for variances and uncertainties *independently*.
- 2) "Baseline" for variances should be IFM 5-minute modeled award.
- 3) "Actual" for variances should be expected 5-minute performance at time of real-time flexi-ramp procurement decision.
- 4) If the net overall variance of the grid, for respective 5-minute intervals, leads to Flexi-Ramp Up procurement, then all positive demand variances / negative supply variances are charged the Flexi-Ramp Up price and all negative demand variances / positive supply variances are credited the Flexi-Ramp Up price. Each SC's 5-minutes charge or credit is summed for the month.
- 5) SCs with net credits on the month are not paid out; These credits are used to lower the SCs charges for Flexi-Ramp Down, and any residual credits are used to lower the cost of Flexi-Ramp Up charges for other SCs.
- 6) Repeat (4) and (5) for Flexi-Ramp Down for variances.
- 7) "Baseline" for uncertainties should be expected 5-minute performance at the time of CAISO's real-time flexi-ramp procurement decision (RTUC run).
- 8) "Actual" for uncertainties should be the actual 5-minute performance.
- 9) Total CAISO Flexi-Ramp Up and Flexi-Ramp Down needs related to uncertainties are added to the total CAISO Flexi-Ramp Up and Flexi-Ramp Down needs related to variances, to calculate net Flexi-Ramp Up and Flexi-Ramp Down procurements
- 10) SCs are allocated Uncertainty Flexi-Ramp Up costs based on SC Up deviations (Actual-Baseline) / Total Grid Up deviations (Actual-Baseline) * Flexi-Ramp Up Costs associated with Uncertainty (summed over the respective period for the month)
- 11) SCs are allocated Uncertainty Flexi-Ramp Down Costs based on SC Down deviations (Actual-Baseline) / Total Grid Down deviations (Actual-Baseline) * Flexi-Ramp Down Costs associated with Uncertainty (summed over the respective period for the month)

While these elements require greater development, Powerex believes the above provides an initial framework for further discussions with CAISO and stakeholders, in an extended Flexi-Ramp Product stakeholder process.

Moreover, Powerex believes, through further discussions, it can demonstrate that the CAISO's existing approach will:

- 1) Violate cost causation principles, by allocating Flexi-Ramp costs to SCs, whose activities may actually be reducing overall Flexi-Ramp needs. For example, intertie schedules that differ hour to hour will be allocated costs under the CAISO proposal, but will not receive offsetting credits during 15-minute intervals in which the variance they provide reduces CAISO Flexi-Ramp total procurement quantities.
- 2) Violate comparable treatment, by charging intertie participants, internal generators and load customers different Flexi-Ramp costs when their performance and energy awards on the grid are identical. For example, consider a generator that ramps from one hour to the next at an identical rate to an intertie ramp as a result of an IFM award - will the CAISO's cost allocation proposal ensure it receives the same cost allocation as the intertie?
- 3) Violate accurate price signals and violate incentivizes behavior by discouraging intertie schedules which provide net ramping benefits to the grid, relative to those that do not. For example, an SC that provides flat block intertie energy will be exempt from Flexi-Ramp product costs, while an SC who provides an hour to hour shaped schedule, which may actually reduce overall Flexi-Ramp product procurement quantities and costs, will be charged for Flexi-Ramp costs.

In closing, Powerex is strongly supportive of the CAISO's need to develop the Flexi-Ramp product but just as strongly reiterates its request for an extension to the stakeholder process on this important product to ensure the final product will meet the operational needs of the CAISO and the proposal follows the CAISO's cost allocation principles.