

Comments of Powerex Corp.
Flexible Ramping Product

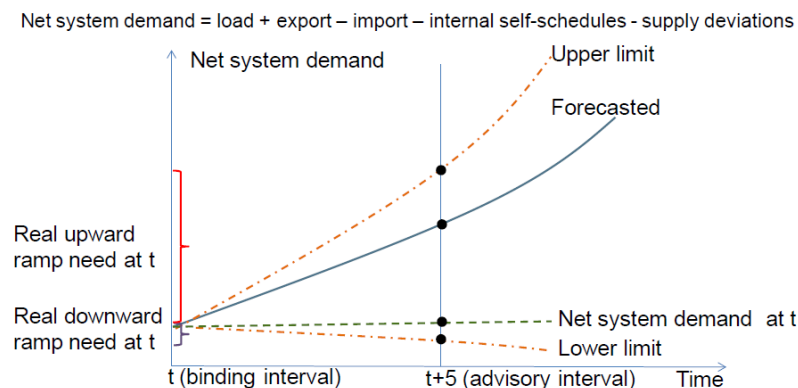
Submitted by	Company	Date Submitted
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Powerex appreciates the opportunity to provide these limited comments on the Flexible Ramping Product Straw Proposal published on June 2, 2014. As previously stated, Powerex strongly supports the need and general concept of this product. However, Powerex remains very concerned that the proposed cost allocation violates cost causation and will send price signals to *reduce* flexibility on the interties in both the day ahead and real-time markets. CAISO proposes to charge for ramping activity that contributes to system-wide ramping costs, but does not propose to provide any credit for ramping activity that reduces these costs. This will create a situation where ramping activity can *only* incur costs, and hence market participants will have an unambiguous incentive to avoid or minimize all ramping activity through the submission of schedules that do not change in each hour or in each fifteen-minute interval. While this will insulate participants from flexible ramping product cost allocations, it will reduce flexible supply offered to the CAISO. Powerex urges CAISO to reconsider its asymmetric cost allocation and instead develop a tiered allocation providing for both costs and credits for expected ramping activity, while maintaining an allocation of only charges (and no credits) for uncertain ramping activity that is not realized until real-time operation.

The CAISO identifies two drivers of the need for Flexible Ramping Products:

- (i) Expected Variability – The Expected Net System Demand
- (ii) Uncertainty – The Range of Error In the Expected Net System Demand

These two concepts are illustrated in Figure 2, on page 7 of the Straw Proposal:



Real ramping need:

Potential net demand change from interval t to interval t+5
(net system demand t+5 – net system demand t)

Expected Variability can be seen as the forecasted difference between the Net System Demand at t and the Net System Demand at t+5.

Upward Uncertainty can be seen as the difference between the Upper Limit at t+5 and the Forecasted Net System Demand at t+5

Downward Uncertainty can be seen as the difference between the Forecasted Net System Demand at t+5 and the Lower Limit at t+5.

Expected Variability is the amount by which the Net System Demand is *expected* to change. For example, if hourly import schedules change from 500 MW in HE 7 to 600 MW in HE 8, CAISO would expect (and typically requires) that the 100 MW change will occur over the 20 minute period between 0650 and 0710. Each of the 5-minute intervals within this time period will include Expected Variability of +25 MW. Similar predictable changes arise from ramping between 15-minute intervals (with ramps occurring over a 10-minute period). Importantly, changes in Expected Variability may increase or decrease the CAISO's need for (and cost of) Flexible Ramping Products.

In contrast, "Uncertainty" arises from *potential but uncertain* changes in Net System Demand that are not forecast at the time of Flexible Ramping Product procurement, but may materialize in RTD. Uncertainty can be associated with load forecast uncertainty, variable energy resource output or the delivery performance of interchange schedules. These unpredictable changes may either reduce or exacerbate system-wide changes in Net System Demand, but due to their uncertain nature these changes necessarily increase—and never decrease—the CAISO's need for Flexible Ramping Products. Put another way, it would only be "good luck" if the upper and lower limits of uncertainty are not reached, but CAISO must still ensure sufficient flexible capacity is available if they are reached.

Consider the following numerical example:

At the time of Flexible Ramping Product procurement, CAISO forecasts a 500 MW increase in Net System Demand between t and t+5. CAISO estimates that the 97.5 percentile of Net System Demand change is 800 MW, and that the 2.5 percentile of Net System Demand change is -100 MW. This can be restated as follows:

Expected Variability: +500 MW
Upward Uncertainty: +300 MW
Downward Uncertainty: -600 MW
Range of Net System Demand change from t to t+5: -100MW to +800MW

In this example, CAISO would require 800 MW of Flexible Ramping Up and 100 MW of Flexible Ramping Down. Assuming that the clearing price of Flexible Ramping Up is \$10 per MW and the clearing price of Flexible Ramping Down is \$2 per MW, CAISO would incur total Flexible Ramping Up costs of \$8,000 and total Flexible Ramping Down costs of \$200, for a total cost of \$8,200.

Consider the change in these requirements when a day ahead import is scheduled to ramp in by 200 MW between t and t+5. This import ramp is opposite to the overall system needs, and hence reduces Expected Variability from +500 MW to +300 MW. Assuming the level of uncertainty is unchanged, the CAISO would now require 600 MW of Flexible Ramping Up and 300 MW of Flexible Ramping Down.

Expected Variability: +300 MW
Upward Uncertainty: +300 MW
Downward Uncertainty: -600 MW
Range of Net System Demand: -300 MW to +600 MW

Assuming the same market clearing prices as above, CAISO would incur total Flexible Ramping Up costs of \$6,000 and total Flexible Ramping Down costs of \$600, for total costs of \$6,600.

The net effect of this change in Expected Variability is both an increase in the Flexible Ramping Down product requirement and a **decrease** in Flexible Ramping Up product requirement, leading to a \$1,600 reduction in the CAISO's total Flexible Ramping Product costs.

However, the CAISO's proposed cost allocation framework asymmetrically charges the cost-lowering import for a share of the Flexible Ramping Down product, but does not provide a credit for, or otherwise reflect the decrease in, the Flexible Ramping Up product. Even though total Flexible Ramping costs have *decreased*, the SC for the day-ahead import in this example will nevertheless face a net *charge* for Flexible Ramping Products. Such a cost allocation approach is inconsistent with cost causation and, perhaps more importantly, will send a powerful disincentive to activities that reduce the CAISO's costs of meeting its ramping and flexibility needs.

The Straw Proposal attempts to address this problem in an example in which an import ramp opposite to load movement is charged Flexible Ramping Down costs, but those costs happen to be zero in the example. Powerex requests that CAISO acknowledge that Flexible Ramping Down costs will not necessarily be zero whenever prevailing ramping needs are in the upward direction.

In addition to the clear violation of cost causation and inefficient price signals sent to interchange ramps that are a net benefit to the CAISO's Flexible Ramping costs for a *single* interval, the CAISO's asymmetric approach to applying flexible ramping costs (but not credits) to known variations is also problematic when applied across *multiple* intervals. For example, an interchange ramp that occurs across 20 minutes in the IFM (or 10 minutes in the fifteen minute dispatch), may increase the CAISO's overall Flexible Ramping costs in one 5-minute interval, but reduce its Flexible Ramping Product costs in the other intervals, resulting in an overall reduction in Flexible Ramping Product costs across the entire interchange ramping period. But under the CAISO's proposed cost allocation approach, such net beneficial ramping activities will be assessed Flexible Ramping Product costs that ignore—and do not provide a credit for—the cost reductions attributable to the intertie schedule. As in the single-interval example, above, the CAISO's proposed cost allocation will discourage intertie flexibility by making all ramps “must lose” situations for the SCs that undertake them.

Intertie schedules that change in quantity from one hour to the next (in the IFM or HASP process) or from one fifteen minute interval to the next (in Real Time) in response to CAISO LMP price signals are often valuable sources of both flexibility and ramping capability for the CAISO. However, under the proposed Flexible Ramping Product cost allocation approach, **any** change in intertie schedule—no matter how helpful in reducing the CAISO's Flexible Ramping costs across the ramping period that would **otherwise** be incurred absent such intertie schedule change—could only attract Flexible Ramping costs, as seen in the above example. Moreover, to avoid such charges, the expected rational response will be for market participants to simply seek to have “flat” schedules, since only schedules that do not change are immune from Flexible Ramping Product charges. A move to less flexible scheduling will not only increase the

CAISO's Flexible Ramping Product needs (and hence its costs), but will also reduce its flexibility more generally and potentially lead to a less efficient unit commitment and energy dispatch.

Powerex urges the CAISO to reevaluate its cost allocation proposal, providing both credits and charges to activities that impact Expected Variability. For example, CAISO could consider a two-tiered cost allocation approach, with separate cost allocations for Expected Variability and for Uncertainty. Such an approach would ensure that beneficial ramping activity provided on the interties in the day ahead and real-time markets are not unnecessarily and inefficiently discouraged, and would ensure that costs are allocated consistent with cost causation. Activities that cause changes to Net System Demand that are not forecasted at the time of Flexible Ramping Product procurement (*i.e.*, Uncertainty) should continue to receive only charges, without credits, since such changes cannot be relied upon to reduce Flexible Ramping Product procurement volumes in either direction.

Powerex also notes that such an approach would be consistent with the CAISO's allocation of the costs of contingency reserves, whereby importers receive credits for the reserves the CAISO would *otherwise* need to carry, absent the cost-reducing activity. A similar principle applies here: market activity that reduces the CAISO's costs of procuring Flexible Ramping Products should receive a credit, while market activity that increases those costs should be charged an appropriate share of those costs.