# Comments on Flexi-Ramp Product Draft Final Proposal
## Department of Market Monitoring
## May 2, 2012

The Department of Market Monitoring appreciates the opportunity to review and comment on the ISO's Draft Final Proposal for the Flexible Ramping Product. DMM generally supports the ISO proposal and we have included comments below for items where we have concerns. The main points from these comments are:

- ***Procurement Requirement:*** The ISO has not provided sufficient specification of the determination of the requirement or a sense of the expected magnitude. The historical period used in the statistical model, frequency of recalculation, granularity of requirement specification, and range of values all provide context for this initiative and should be presented to stakeholders.
- ***Release and Procurement in RTD:*** Potentially allowing a higher requirement in RTD than what was procured earlier in the real time market may artificially create infeasibility and result in high prices in both flexible ramping produce and energy prices. DMM recommends that the ISO monitor for these circumstances and be prepared to adjust the model accordingly.
- ***Day Ahead Procurement:*** Procurement in the day ahead market may be infeasible in real time (as seen in ancillary services) and provide another reason for real time exceptional dispatch to achieve feasibility. DMM recommends the ISO monitor the extent to which this occurs and consider alterations if necessary.
- ***Operator Intervention:*** Manual adjustments to the requirement can have a significant impact on prices in both the flexible ramping product and energy in real time. Such adjustments should be guided by explicit criteria, clearly logged, and evaluated in a feed-back process to improve the performance of the requirement calculation and reduce the frequency of manual intervention.
- ***Cost Allocation:*** The proposal adequately applies cost causation given the temporal gap between deviations used in the setting of requirements and procurement of the product. This should provide the proper incentives to reduce deviation at the resource level over time. DMM recommends a change to the VER hourly profile methodology to prevent strategic behavior that will inappropriately shift cost to other resources.

In addition to items discussed in this set of comments, more detailed discussion of certain issues can also be found in DMM comments on prior versions of the proposal.

### Flex-Ramp Requirement

The ISO proposal still does not contain adequate specification of the determination of the procurement requirement. The proposal states that a statistical model will be used to set the procurement requirements, however little detail is available on the specification of the model and how it will be applied. A proposed formulation with the independent variables specified is useful in determining how deviations impact procurement and ultimately cost. Further, specification of the duration of historical

values used in the model, the frequency with which the model will be run and requirements re-set, the granularity of the requirement (hourly, 6-hour period, etc.) all have bearing on the potential accuracy, variability, and impact of the proposal. The proposal has also not provided an expected range of requirement values for both products for the periods identified in the proposal or any thresholds that may be placed on the output from the statistical model. These elements are useful in more fully understanding the effectiveness of the proposal and potential impacts. DMM recommends that the ISO provide specification of the above items prior to seeking approval from the Board of Governors.

We also note that there is a degree of ramping capability inherent in the set of energy bids that are submitted to and dispatched by the imbalance market. Ramping is a feature of a 5-minute dispatch and the imbalance market price for energy increases as inherent ramping energy becomes more scarce. The proposal does not appear to distinguish between the inherent ramping capability of the imbalance energy bids and the flexible ramping product requirement. This will result in procuring and pricing both inherent ramping capacity and additional ramping capacity together as flexible ramping product, while the imbalance energy market will continue to procure and price the inherent ramping capability. In intervals where flexible ramping product is priced and there is relative scarcity of ramping energy in the imbalance market, the ramping capacity inherent in the energy offers will be priced and paid twice in a manner reflecting scarce ramping capacity. One alternative to separating these types of ramping energy is to adjust the flexible ramping product requirement to account for the inherent ramping capacity that exists in the energy bids. DMM does not oppose the ISO proposal to explicitly procure and price the anticipated need for ramping capacity. We do believe it is important that this decision is made understanding that ramping capability is an inherent quality of supply in a 5-minute energy dispatch market, there is often considerable inherent ramping capability in the imbalance offers, and that some ramping capacity will be paid twice on prices reflecting some level of scarcity in ramping capability in the imbalance market.

**Release and Re-Procurement of Ramping Capacity in RTD**

DMM remains concerned about the potential infeasibility of the flex-ramp in RTD. The RTD flex-ramp requirement is determined separately from RTPD requirement, and previously procured flex-ramp product is released and re-procured in RTD to meet a possibly different RTD requirement. Since RTD is not capable of unit commitment, re-procuring flex-ramp capacity in RTD to meet a new requirement may result in infeasibility if the RTD requirement is higher than the RTPD requirement. This leaves only re-dispatch of resources in RTD as a means to meet a higher requirement and during tighter conditions there may not be sufficient options among existing online units to release the needed capacity. In this case it is likely that both the RTD energy price and RTD flexible ramping product price will be high, signaling a scarcity that cannot be resolved in the short term.

The proposal includes a penalty priced demand curve to address these circumstances in RTD. This approach partially addresses the problem. A multi-segment demand curve can cap the flex-ramp clearing price in RTD, but it does not completely address the infeasibility issue due to lack of unit commitment. The financial impact of flex-ramp infeasibility in RTD may be significant as tight ramping conditions (either naturally occurring or due to a shock) and the flex-ramp requirement in RTD can drive

the energy price higher as well. An alternative to reduce the likelihood of scarcity driven by infeasibility in the requirement for flexible ramping product is to cap the RTD requirement to be no greater than the RTPD requirement where unit commitment was last possible.

**Day-ahead Procurement**

DMM remains concerned about the feasibility of such reservations in day-ahead, which is far in advance from real time. Currently, the ISO observes real time infeasibility of ancillary services that were awarded in the day ahead market. This is due to different unit-level ramp rates in real time compared to those assumed in the day ahead market where the procurement occurred. The difference in ramp rates is largely attributable to real time dispatch that puts the unit on a portion of its output curve having a lower ramp rate that did the day ahead schedule. While the ISO does have the opportunity to re-procure ancillary services and flexible ramping product in the real time market, we do observe exceptional dispatches to resources to move them to a point in real time where they can provide the ancillary services that were procured in the day ahead market. This presents a potential market power situation since exceptional dispatches for this reason are not subject to mitigation however there is limited competition among the few resources that need to be exceptionally dispatched for this reason. We expect the need to exceptionally dispatch units for flexible ramping product feasibility will occur and encourage the ISO to leverage real time procurement before issuing exceptional dispatches, and to monitor the extent exceptional dispatches are required for flexible ramping product feasibility in the event an alternative approach needs to be implemented.

**Operator Intervention**

ISO Operators will have the ability to adjust the flexible ramping requirement through manual intervention. DMM remains concerned about the impact of manual intervention on flexible ramping product prices and on imbalance energy prices. Leveraging procurement of this product for anticipations outside those captured in the requirement or to obtain a different dispatch in the real time market presents unintended pricing consequences in flexible ramping product, energy, and ancillary service prices in real time. DMM recommends that the ISO proposal include monitoring and feedback functions related to operator intervention both load biasing, FRP requirement biasing, and exceptional dispatch for ramping. DMM also recommends the ISO put in place manual adjustment procedures and/or tools for determining appropriate levels of manual intervention.

**Market Power Mitigation**

The ISO proposal contains two market power mitigation measures. The implicit measure is a must-offer obligation where resources that submit energy bids must also offer that capacity to the flexible ramping product market. In cases where an offer is not submitted, the ISO will submit an offer for that unit with a $0/MW price. This will help insure sufficient supply exists to meet the requirements. Procurement in the day ahead market will also help address potential temporal market power that may arise

subsequently in the real time market by securing a majority of the requirement under conditions where the market has more choices.[1]

The explicit measure is a bid price cap of $250/MW which is consistent with the existing caps on ancillary services. We note that one feature of the flexible ramping product in real time is to shift the impact of certain scarcity conditions from the 5-minute energy market to the real time flexible ramping product market.[2] This will presumably limit the financial impact of these events, including temporal market power, that may arise as a result of scarcity in real time. Given this product will be procured to a system-wide requirement, DMM does not view additional mitigation measures as necessary. However, the ISO has left open the potential to procure flexible ramping product regionally, which would require further assessment of competitiveness and potential additional mitigation measures.

**Cost Allocation**

DMM tentatively supports the ISO cost allocation proposal. While the proposal does not directly link deviations to costs incurred in the same time period, the allocation does follow cost causation over a two month period and provides clear incentives for participants to reduce their deviations which will reduce overall cost from procurement as well as reduce the participant's exposure to those costs.

In theory, the flexible ramping requirement is what will determine the procurement of the flexible ramping product, and so under pure cost causation the drivers of the requirement should be allocated the costs. In every interval there will be a requirement that was derived from observed historical unexpected deviations from generation, intertie schedules, or load. There will be a feedback loop where if deviations decreased over-all in an hour, the requirement will shrink and presumably so will cost.

The ISO has indicated that in practice allocating based on the drivers of the requirement would be extremely difficult and burdensome due to the complex statistical nature of the requirement. DMM suggests that any *ex post* methodology should be aligned as much as possible with cost causation principles and views the proposal as a reasonable approach to aligning resource actions with cost allocation that will provide a clear incentive to reduce deviations.

- ***Hourly Profiles***

DMM has a general concern with allowing variable energy resources (VERs) to submit an hourly profile that has no validation applied and has no cost allocation repercussions outside the flexible ramping product allocation. Under the current proposal VERs will have the ability to manipulate the hourly profiles in order to reduce their share of the cost allocation. For example, if in one interval a ramping

[1] Note that the ability for procurement in the day ahead market to help mitigate temporal market power in the real time market can be reduced by disqualification of capacity for lower ramp rate as described in the "Day Ahead Procurement" section of these comments.

[2] Provided the RTD requirements for flexible ramping product aren't set such that this is not possible.

product's average monthly price is consistently higher than the other, then the VERs can submit an hourly profile different than their actual schedule to try and take advantage of the price differential. If flexible ramping up is consistently is higher priced with a greater overall cost than Flexible Ramping Down, then a VER has the incentive to submit a lower schedule profile so that they are more likely to positively deviate rather than negatively deviate. Over the month they have the opportunity to manipulate their deviations from one direction to another. This can be used to artificially reduce exposure to the flexible ramping product costs and circumvent both cost causation as well as incentives to reduce deviation to avoid costs.

DMM recommends that the ISO uses its own forecast for VERs and adjusts those forecasts every 15 minutes to reflect changing conditions.

Generally, the calculation of hourly profiles should align with the flexible ramping requirement formulation for this to be at all aligned with cost causation principles. The existing proposal does have a temporal disconnect between the deviations used in the statistical model to determine procurement requirements and the deviations that will comprise the basis for allocating the resulting cost. However, the allocation model does have a strong positive feedback mechanism that provides a clear incentive for all resources to reduce deviations in order to reduce their exposure to procurement costs.

- ***Monthly Re-Settlement***

DMM supports the ISO plan to re-settle across the month for four portions of the day rather than over all hours. There naturally exists a disconnect between current deviations and the current procurement requirement (and hence cost) because a statistical model using historical data is used to determine procurement requirements. Reducing deviations in the current period cannot reduce the procurement requirement or cost. Because of this disconnect, DMM believes that a more granular settlement may not more accurately reflect cost causation. The ISO proposal divides a 24 hour day into periods where source groups (generators, load, interties) may have more prevalent deviation patterns and consequently one ramping product may be more valued than another.

Although it cannot be concluded that a specific resource in a specific interval caused that interval's flexible ramping requirement, the periods are constructed such that characteristic deviations are likely drivers of the requirement and hence appropriate for cost allocation basis. It is reasonable that over time re-settlement will align with the largest contributors to the associated procurement requirement. While this will not perfectly line up with the requirement formulation, it is a reasonable proxy and will provide the correct incentives to reduce deviations.

- ***Netting Deviations***

A critical component of the cost allocation proposal is how deviations are allowed to net against each other. DMM agrees with the deviation netting approach put forth for both the group-level allocation as well as the resource-level allocation. We specifically note the importance of netting deviations at the resource-level allocation. The need for dispatchable ramping capacity is evaluated (either in the imbalance market or via the statistical model that determines the requirement) for a single 5-minute

dispatch interval. Neither the market nor the statistical model are able to "smooth" the need for dispatchable ramping capacity over time. Allowing the netting of resource-level deviations over settlement intervals will likely result in lower cost allocation to resources with greater variation in their uninstructed deviation which will be disproportionate to the contribution those resources made to the procurement requirement and ultimately the cost of procurement. This can significantly retard the market incentive for resource controllers to reduce their exposure to cost by reducing their deviations and ultimately hinder the impact this product can have on reducing uninstructed deviations over time.