

PG&E's Comments

Flexible Ramping Product Draft Final Technical Appendix and Revised Draft Final Proposal

Submitted by	Company	Date Submitted
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PG&E appreciates the opportunity to comment on the CAISO's Flexible Ramping Product Draft Final Technical Appendix, and Revised Draft Final Proposal dated December 17, 2015. PG&E supports CAISO's efforts to develop an approach to procure Flexible Ramping Product in general and seeks more information on certain design aspects and tracking of their impacts. In summary, the changes to the CAISO's Draft Final Technical Appendix were:

- Modification of the capacity constraints to allow netting of FRU and FRD to allow for a more flexible dispatch
- Modification of the settlement example covering ramp granularity resulted in ramp deviations that are settled between FMM and RTD

In response, PG&E offers the following comments:

1. PG&E supports CAISO's overall approach to developing a flexible ramping product to procure FRU and FRD products in the RT markets.
2. PG&E supports the idea of accumulating practical experience in implementing FRU and FRD in RT markets prior to DA market implementation.
3. PG&E supports the new set of rules for the settlement of the forecasted movement.
4. PG&E supports the proposed set of settlement rules for the uncertainty portion of the FRU and FRD.
5. PG&E reiterates its previous comment that the CAISO track and report on the impacts of the selected demand curves for FRP.
6. PG&E supports the proposed double payment rules.
7. PG&E has a concern that the modifications to the capacity constraints on dispatchable resources to allow netting of FRU and FRD may result in procurement of FRU or FRD on resources that is not actually available.

1. Overall design

Comment:

PG&E is in favor of transitioning from current FRU constraint implementation to a product approach that addresses both up and down ramping needs raised by uncertainty. In the existing approach, CAISO can procure (and pay for) ramp capability in the Fifteen Minute Market to address uncertainty in an advisory interval which may not be available in the Real Time Dispatch when the advisory interval becomes the binding interval. As a consequence, CAISO may pay for a service that will not be available adversely affecting reliability. This limits the effectiveness of the FRU constraint implementation.

PG&E supports CAISO's overall approach to developing and implementing the FRU and FRD products.

2. Procurement only in real-time market

Comment:

PG&E views this step as a building block to accumulate operational experience with the implementation of Flexible Ramping Products in the real time markets. Based on this experience, CAISO and the stakeholders can decide whether introducing these products into the Day Ahead market can help ensure that more flexible units are committed in DA market to meet uncertainty in RT market.

3. Settlement of forecasted movement

Comment:

PG&E supports splitting the settlement of ramp into two parts, forecasted movement and the Flexible Ramp procured for uncertainty.

PG&E supports settling forecast movement of dispatchable and non-dispatchable resources in FMM at the FMM price and settling any difference between FRP procured for the FMM forecasted movement and the RTD forecasted movement w at the RTD FRP price. PG&E also supports the proposed treatment of load.

PG&E also supports the decision to award FRP revenues to intertie resources. If intertie resources provide movement that is in the direction of the ramping need, it is fair to compensate them as any other resource would be compensated. In addition, PG&E supports the decisions related to the "no grid management" charges and elimination of "no pay" charges. These charges are unnecessary and makes settlement of FRP costs much simpler.

4. Settlement of uncertainty

Comment:

PG&E supports the proposed treatment of FRP for uncertainty. Settling with dispatchable resources at the applicable binding interval FMM or RTD prices at the end of the month and allocating the resulting cost to those who benefited from procuring rampable capacity for uncertainty at

the end of the month through an uplift seems reasonable.

5. Demand curve for uncertainty

Comment:

PG&E is concerned that the penalty prices used by the CAISO in developing the demand curves used to obtain and price ramping capacity might lead to setting unnecessarily prices for FRU and/or FRD. PG&E supports the CAISO's current demand curve approach as long as the CAISO states the criteria it will use to determine when it will revisit the method used to set the demand curve.

PG&E looks forward to overall cost savings, including any ramp shortage costs, from incorporating FRP in real time markets.

6. Double payment rules

Comment:

PG&E supports the proposed double payment rules.

Using resource's metering data, the CAISO will determine if the resource was double paid by comparing uninstructed imbalance energy (UIE) to the FRP award. In such cases, the CAISO will rescind the FRP awards.

7. Other

Comment:

PG&E has concerns that the modifications to the capacity constraints that allow netting of FRU and FRD on dispatchable resources may result in procurement of FRU or FRD on resources that is not actually available. PG&E believes that CAISO should correct this problem before implementing the approach.

For simplicity in this comment, we will only consider energy dispatch and flexible ramp requirements and ignore other ancillary services. We will also only consider Upper Operating Limit (UOL) and Lower Operating Limits (LOL) on a resource and assume that the Upper Economic Limit on a resource is the same as its UOL and that the Lower Economic Limit on a resource is the same as its LOL.

The goal of the design in the technical appendix was to account for changing limits on dispatchable resources without limiting the ability to economically dispatch the resources. For example, for a VER with a decreasing forecast, the original formulation would have required that

$$EN_{i,t} \leq UOL_{i,t+1} < UOL_{i,t}$$

That is, a resource i in period t would be forced to be dispatched below its actual limit in period

t. To address this, the model in the technical appendix would replace :

$$EN_{i,t} + FRU_{i,t} \leq UOL_{i,t+1}$$

$$FRU_{i,t} \geq 0$$

and

$$EN_{i,t} + FRD_{i,t} \geq LOL_{i,t+1}$$

$$FRD_{i,t} \leq 0$$

by

$$LOL_{i,t+1} \leq EN_{i,t} + FRU_{i,t} + FRD_{i,t} \leq UOL_{i,t+1}$$

$$FRU_{i,t} \geq 0$$

$$FRD_{i,t} \leq 0$$

This eliminates the original problem, but may cause a different problem.

Since FRU and FRD are netted in enforcing the operating limits, it is possible to procure FRU in period t that could not be used without violating the upper operating limit in period t+1, or to procure FRD that could not be used without violating the lower operating limit.

We believe that this can be addressed simply within CAISO's overall design by replacing:

$$EN_{i,t} + FRU_{i,t} \leq UOL_{i,t+1}$$

$$FRU_{i,t} \geq 0$$

with

$$EN_{i,t} + FRU_{i,t} \leq UOL_{i,t+1}$$

$$FRU_{i,t} \geq EN_{i,t+1} - EN_{i,t}$$

This will ensure that sufficient ramp is procured to support the projected change in dispatch without over-constraining the dispatch if the energy dispatch must be reduced from t to t+1 due to limit changes or economics.

Similarly, we believe that CAISO can replace

$$EN_{i,t} + FRD_{i,t} \geq LOL_{i,t+1}$$

$$FRD_{i,t} \leq 0$$

with

$$EN_{i,t} + FRD_{i,t} \geq LOL_{i,t+1}$$

$$FRD_{i,t} \leq EN_{i,t+1} - EN_{i,t}$$

To address a similar problem with changes to the lower limit.