



## Comments of Pacific Gas & Electric Company Flexible Ramping Product Refinements

Submitted by	Company	Date Submitted
Todd Ryan (617.784.5342)	Pacific Gas & Electric	12/5/19

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to submit comments on the California Independent System Operator’s (CAISO) Flexible Ramping Product Refinements Issue Paper.

The CAISO’s proposal outlines four changes that will attempt to eliminate situations where Flexible Ramping Product (FRP) is awarded to resources that are unable to provide the awarded FRP. PG&E’s offers the following comments:

### 1. PG&E is very supportive of the direction the CAISO is heading

PG&E is highly supportive of the direction CAISO has taken in this initiative and agree with CAISO’s main proposals.

#### Proxy Demand Response Eligibility:

PG&E supports CAISO’s proposal to eliminate situations where FRP is awarded to proxy demand resources (PDRs) that are unable to respond.

As PG&E understands the issue, the market frequently awards FRP on PDRs because their opportunity cost is zero and therefore, the PDRs are viewed as cheap sources of FRP. However, many PDRs cannot respond to the five-minute dispatch despite the FRP requiring a five-minute dispatch.

#### Ramp Management between FMM and RTD:

PG&E supports the CAISO’s proposal to maintain a portion, up to 100%, of the FRP awards in the buffer interval that were procured in the prior FMM; and hopefully ensure that the ramping capability will be preserved for RTD.

As PG&E understands the issue, the flexible ramping product uncertainty requirement is not enforced in the buffer interval. As a result, the ramping capability procured in the prior RTUC run may no longer available for the RTD intervals. Maintaining a portion of the FRP awards in the buffer interval should ensure that the FRP will be available in real-time.

## Flexible Ramping Product Refinements Issue Paper

*Minimum CAISO FRP requirement:* PG&E supports the CAISO’s proposal to set a minimum amount of the FRP will be procured from resources within the CAISO balancing authority area as an interim measure until the issue of deliverability can be addressed.

As PG&E understands the issue, the details of how net-import/net-export capabilities are counted, it is possible for CAISO BA to procure all of its FRP externally despite that the CAISO footprint is the largest driver of the system-wide flexible ramping product requirement because it has the largest load and penetration of variable energy resources. This could easily lead to FRP awards that cannot be delivered (*i.e.*, imported) and is unnecessarily risky. CAISO’s proposal will address this issue for CAISO first but could apply to other balancing areas in the future.

### **2. CAISO should implement an interim zonal model while continuing to work on a nodal model.**

The CAISO’s proposal highlights that another way that FRP can be undeliverable is by being “bottled” or undeliverable based on congestion. The market does not consider locational constraints when procuring the flexible ramping product. This results in under-utilization or under-deployment of the flexible ramping product.

The CAISO Issue Paper outlines two models for addressing this limitation: zonal and nodal procurement. PG&E recognizes that the issue of deliverability is difficult and both models have their advantages and disadvantages. PG&E recognizes that the best long-term solution may be a nodal model, but it would take a long time to develop and implement. PG&E believes a zonal model presents a good first-step that can be quickly implemented and still achieve much of the desired benefit until the preferred longer-term solution can be addressed.

PG&E encourages CAISO to not let the *perfect* be the enemy of the *good*. CAISO should implement a zonal deliverability model while continuing to develop a nodal model.

3. Additional feedback on the key refinements

**i) Proxy demand-response eligibility (section 2):**

No additional comments.

**ii) Ramp management between fifteen-minute market and real-time dispatch (section 3):**

No additional comments.

**iii) Minimum FRP requirement for CAISO (section 4):**

PG&E agrees with the CAISO's suggested approach as an interim solution. It is PG&E's understanding that the *minimum FRP requirement* won't be needed once a deliverability model is implemented.

**iv) Deliverability enhancement (section 5-5.2):**

Per CAISO’s request for further discussion of the advantages and disadvantages of the deliverability, PG&E has provided a summary table:

Model	Pros	Considerations / Difficulties
<b>Zonal Model</b>	<ul style="list-style-type: none"> <li>- Easier to develop and implement.</li> <li>- Likely solves much of the problem (reaps most of the benefits)</li> <li>- Consistent with existing approach for Ancillary Services</li> <li>- Achievable</li> </ul>	<ul style="list-style-type: none"> <li>- Zones would be defined prior to the market run (<i>a priori</i>). Defining zones before the market is run to adequately address transmission remaining after the energy is scheduled in the market requires careful consideration.</li> <li>- Effect of transmission congestion within a zone may still affect deliverability of FRP procured within a zone to meet the zonal requirement. Defining zones and zonal requirements to minimize this effect may require significant work.</li> <li>- Need method to distribute the system requirement to zones.</li> <li>- A binding zonal requirement may drive unit commitment, and therefore uplift costs.</li> </ul>
<b>Nodal Model</b>	<ul style="list-style-type: none"> <li>- A better solution for the long-term.</li> </ul>	<ul style="list-style-type: none"> <li>- Will require an extremely high level of effort to develop and implementation.</li> <li>- Does not guarantee deliverability in all cases depending on the formulation as it still assumes dispatch and transmission availability and makes an assumption of where the FPR needs to be delivered.</li> <li>- When CAISO considers a nodal formulation, specifying the nodes at which FRP can be procured should be relatively clear. However, CAISO will also have to specify the nodes to which energy from FRP will have to be delivered. Specifying such nodal requirements will require careful thought. The effort to develop this formulation may provide significant benefits since it can allow the delivery of FRP to be co-optimized with other products being delivered on constrained transmission.</li> </ul>

**v) EIM Governing Body classification (section 6.2):**

No comment at this time.

**vi) Additional comments:**