

Comments of Pacific Gas and Electric Company

Flexible Ramping Product – Technical Workshop

Submitted by	Company	Date Submitted
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1. Introduction

Pacific Gas & Electric (“PG&E”) appreciates the opportunity to participate in the stakeholder process for the California Independent System Operator’s (“CAISO”) Flexible Ramping Product (“FRP”) Initiative and to submit comments regarding the CAISO’s May 29, 2012 Technical Workshop. PG&E recognizes and appreciates the effort the CAISO has made in developing the FRP proposal. We also applaud the CAISO’s decision to delay Board consideration of this initiative from May to September. Given the inherent complexity of the FRP’s design and the benefit of getting several more months of experience with the Flexible Ramping Constraint, PG&E could be supportive of moving the CAISO Board consideration to November; it is important to take the necessary time to develop a product design that meets the identified needs with less complexity and cost.

The Technical Workshop steps back from design presented in the April 9th Draft Final Proposal and presents high-level design alternatives for stakeholders to consider. The CAISO is seeking input on information and analyses stakeholder would like to see to help inform the market design decisions. As noted in the Workshop, it will be difficult to choose between some of these alternatives without supportive analysis.

PG&E would like to see illustrative numerical examples for the following:

- Determination of FRP Procurement Target for both the Explicit and Implicit Approach¹
- Dispatching FRP in Real-Time Dispatch (“RTD”)²
- Conversion of FRP and non-contingent spinning reserves between the Day-Ahead (“DA”) and the Real-Time Pre-Dispatch (“RTPD”)³

PG&E also asks the CAISO to consider performing the following analyses:

¹ This topic is discussed in Slides 4- 6 of the “Technical Workshop on Flexible Ramping Products” presentation.

² This topic is discussed in Slides 7-8 of the “Technical Workshop on Flexible Ramping Products” presentation.

³ As discussed in April 9, 2012 FRP Draft Final Proposal.

- Explicit and Implicit FRP Procurement Market Simulations
- Explicit versus Implicit Dispatch Market Simulations
- Historical Analysis of Proposed Cost Allocation

These requests are discussed in the Comments section below.

2. PG&E Comments

Provided below is a discussion of PG&E's suggestions for additional information or analyses that would advance the discussion of the design options presented at the Technical Workshop.

A. Procurement Target – Explicit Versus Implicit

Illustrative Numerical Examples

- 1) Provide example for explicit approach - example should clarify the equations provided in slide 5. There was confusion about the meaning of some of the notation when discussing the equations with CAISO staff at the Workshop.

It would be especially helpful if the example uses actual data to determine the imbalance distribution (which will measure the RTD net load deviation from RTPD load) and how it translates into a procurement requirement in the DA market and a commitment requirement in the RTPD.⁴

Stakeholders also need more specific information to assess the explicit procurement approach including:

- What is the statistical methodology to develop the distribution?
 - How much historical data will the CAISO use to determine the imbalance distribution (one month, six-months, or a year)?
 - How often will the CAISO review and revise the requirements?
 - How will the CAISO know whether the requirements are too high?
- 2) Provide example for implicit approach - example should clarify the equations provided in slide 5. It would be most helpful if the example shows how the benefits of flexible ramping capability would be calculated and how that would be translated in MW prices used to construct an FRP demand curve. The example should illustrate how the demand curves would be used to determine the procurement target in the DA, RTPD, and RTD market and should compare the results with the Explicit Approach.

⁴ As PG&E understands it, the CAISO will use the same distribution to determine the total FRP requirement. But it is unclear as to how this can be the case when the procurement in DA market is based on an hourly FRP requirement and commitment in the RTPD is based on a 15-minute FRP requirement.

Analyses

3) Market Simulation – Explicit Procurement with Different Confidence Intervals

Reason for Analysis: What are the impacts on the market of procuring different levels of FRP in DA versus the RT?

Description of Analysis: For explicit approach, examine some representative hours. Perform multiple market simulations with differing confidence levels of FRP in the DA market. Simulation can use FRP bids that are some reasonable multiple of spinning reserve bids.⁵

4) Market Simulation – Implicit Procurement

Reason for Analysis: What are the impacts on the market of procuring FRP using an implicit demand curve? Comparison of the market results to the results of explicit procurement simulation results can help inform the explicit versus implicit procurement decision.

Description of Analysis: Create one or more reasonable demand curves. Examine some representative hours and simulate the market procuring FRP assuming FRP bids are some reasonable multiple of spinning reserve bids. Compare these results to the explicit approach. Are there advantages of one approach over the other?

B. Dispatching FRP in RTD

Illustrative Numerical Examples

5) Provide example for explicit dispatch approach.

6) Provide example for implicit dispatch approach.

Providing the examples will help ensure that stakeholders and the CAISO have a uniform understanding of the alternatives. It would be most helpful if the numerical examples are constructed in a way to allow comparison of the explicit approach with the implicit approach. Specifically, the examples should show how employing the implicit approach will allow the CAISO to distinguish between a *capacity constrained* resource and *ramp constrained* resource.

Analysis

7) Market Simulation - Explicit versus Implicit Dispatch

Reason for Analysis: Determine if there market advantages to the implicit dispatch approach as compared to the explicit method.

⁵ In previous proposals, the CAISO has proposed to use the imbalance distribution to procure to a 60% confidence level in the DA market. The remaining amount of FRP capacity will be committed in the RTPD to reach a 95% confidence level.

Description of Analysis: For some representative hours simulate the market dispatching using the explicit dispatch approach and implicit dispatch approach with differing penalty prices to protect capacity-constrained capacity.

C. Conversion between DA and RTPD

Illustrative Numerical Examples

- 8) It is unclear as to how conversion would work under various scenarios because of how spinning reserves are treated in the Day-Ahead and RTPD. This was described qualitatively in the April 9th Final Draft Proposal (page 19), but there was considerable confusion among stakeholders on how this work actually work. PG&E asks the CAISO to develop detail numerical examples reflecting the spinning reserves rules described in the April 9th Proposal.

Of particular interest is the interplay between any FRP conversion to non-contingent spinning reserves (and vice versa) given the restrictions on spinning reserves procured in the RTPD. When the CAISO procures incremental spinning reserves in RTPD, the spinning reserves is contingent-only.⁶ Also, if the resource providing the incremental spinning reserves in RTPD was also was awarded spinning reserves in Day-Ahead, the total quantity of spinning reserves from the resource is considered contingent-only even if the Day-Ahead award was previously identified as non-contingent.

D. Cost Allocation

Analysis

- 9) Historical Analysis of Proposed Cost Allocation

Reason for Analysis: What would the Cost Allocation look like using historical data? Are there any surprises?

Description of Analysis: Simulate 30 days of cost allocation based on historical data including the impact of monthly re-settlement and share the details with stakeholders. The CAISO has all the data it needs to perform this analysis (other than the profile for variable energy resources (“VERs”).⁷ For VER profiles, the CAISO can use a proxy for the profiles used the actual 15-minute dispatch an hour before the RTPD interval (the assumption is the Scheduling Coordinator could use as a default for the profile the actual 15-minute dispatch from the previous hour).

⁶ Non-contingent spinning reserves cannot be procured in RTPD and can only be procured in the DA market.

⁷ VERs will be required to submit the 15 minute profile (which the CAISO will convert to a ten minute profile) 37.5 minutes prior to the start of “binding” RTPD interval where units are committed to provide the flexible ramping product. The scheduling coordinator will provide a two hour profile of expected output; however, only the first 15 minute interval will set the baseline for measuring deviations subject to the flexible ramping cost allocation and be “binding” for determining the flexible ramping product cost allocation.