

Stakeholder Comments Template

Frequency Response Phase 2 Initiative Working Group

Submitted by	Company	Date Submitted
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This template has been created for submission of stakeholder comments on the working group for the Frequency Response Phase 2 initiative held on February 9, 2017. Information related to this initiative may be found at:

<http://www.caiso.com/informed/Pages/StakeholderProcesses/FrequencyResponsePhase2.aspx>

Upon completion of this template, please submit it to initiativecomments@caiso.com. Submissions are requested by close of business on **March 17, 2017**.

The ISO includes a summary of the brainstormed options for potential solutions to reference while responding to Question 1 and its subparts. Seven potential options were brainstormed, they include:

1. Annual Forward Procurement - external Balancing Authority Area (“BAAs”)
 - a. Only procures incremental amount to cover expected shortfall
 - b. Requires one contract type Transferred Frequency Response Agreement (“TFR”)
 - c. Supports bid submission and settlement of that price if procured
 - d. Does not require any day-ahead or real-time market co-optimized constraint
2. Annual Forward Procurement - external BAAs and internal resources
 - a. Only procures incremental amount to cover expected shortfall
 - b. Requires two contract types (TFR and frequency response awards)
 - c. Supports bid submission and settlement of at least that price if procured
 - d. Requires day-ahead and real-time co-optimized constraint
3. Day-ahead or Real-Time Market Product
 - a. Procures amount to meet total requirement
 - b. Requires one contract type (frequency response awards)
 - c. Supports bid submission and settlement of at least that price if procured
 - d. Requires day-ahead and real-time co-optimized constraint
4. Day-ahead and Real-Time Constraint
 - a. Procures amount to meet total requirement
 - b. Does not support bid submissions but would include some type of settlement for service
 - c. Requires day-ahead and real-time co-optimized constraint
5. Combination Annual for externals and Day-ahead/Real-Time Product
 - a. Procures incremental amount in annual forward procurement that would support bid submission and settlement of at least that price if procured

- b. Separately procures remainder of the amount to meet the total requirement that would support bid submission and settlement of at least that price if procured
- c. Requires day-ahead and real-time co-optimized constraint
- 6. Combination Annual for externals and Day-ahead/Real-Time Constraint
 - a. Procures incremental amount in annual forward procurement that would support bid submission for TFRs and settlement of that price if procured
 - b. Separately procures remainder of the amount to meet the total requirement that would not support bid submission for market constraint but would include some type of settlement
 - c. Requires day-ahead and real-time co-optimized constraint
- 7. "Do nothing"
 - a. Take no proactive action including procuring TFR from external BAAs

Questions:

1. **The ISO seeks stakeholder input on the brainstormed options for a potential solution to the ISO need to take proactive action to ensure its frequency response is sufficient to support reliability in the event of a loss of two Palo Verde units (BAL-003-1 requirement). These include**
 - a. **Provide description of view of advantages, disadvantages, or position on option 1 - Annual Forward Procurement - external BAAs.**
 - b. **Provide description of view of advantages, disadvantages, or position on option 2 - Annual Forward Procurement - external BAAs and internal resources.**
 - c. **Provide description of view of advantages, disadvantages, or position on option 3 - Day-ahead or Real-Time Market Product.**
 - d. **Provide description of view of advantages, disadvantages, or position on option 4 - Day-ahead and Real-Time Constraint.**
 - e. **Provide description of view of advantages, disadvantages, or position on option 5 - Combination Annual for externals and Day-ahead/Real-Time Product.**
 - f. **Provide description of view of advantages, disadvantages, or position on option 6 - Combination Annual for externals and Day-ahead/Real-Time Constraint.**
 - g. **Provide description of view of advantages, disadvantages, or position on option 7 - "Do nothing".**

SDG&E Comments*Mandating Primary Frequency Capability is Inefficient and Unnecessary.*

SDG&E supports the market-based procurement of Primary Frequency Response (“PFR”). With a competitive market in place, it would be unnecessary and costly to mandate that all new generators connecting within the California Independent System Operator (“CAISO”) Balancing Authority have PFR capability. Market clearing prices for PFR will provide price signals that allow prospective suppliers to determine if, and when, it makes economic sense to (i) invest in and maintain the equipment necessary to provide PFR, and (ii) carry the “headroom” that the provision of PFR requires (i.e., the opportunity cost of reserving generating capacity). If the supply of PFR is relatively low, market clearing prices will tend to rise, creating incentives for other generators to enter the PFR market. If the supply of PFR is relatively high, market clearing prices will tend to decline, ensuring consumers pay no more for PFR than is necessary. The market clearing prices for PFR will reflect an efficient equilibrium between PFR supply and PFR requirements.

SDG&E recognizes that the Federal Energy Regulatory Commission (“FERC”) is proposing to require all new generators to install primary frequency *capability*. While well-intentioned, SDG&E believes such an obligation will not achieve the intended result. Surveys have shown that many existing generators with primary frequency response capability are not providing effective response during frequency events.¹ This is not a surprising result considering that, today, generators are not generally compensated for the costs of providing PFR: Under the current framework there are strong economic incentives to avoid providing PFR.

Market-based compensation will provide the appropriate economic incentives. Accordingly, where a competitive market for PFR exists, there is no reason to mandate that generators have PFR capability or, if they have such capability, that it be enabled. SDG&E urges the CAISO to reconsider its previous support at the FERC for the mandatory provision of PFR,² and advise the FERC that where a competitive market for PFR exists, the FERC should not require generators to install PFR capability. If FERC adopts the policy that all new generators must install primary frequency response, the CAISO should seek a waiver on the grounds that a competitive market for PFR “is superior to” a mandatory requirement. The waiver request should point out that because the CAISO balancing authority will have the largest amount of renewable resources in the US, obligating all these resources to provide PFR will be costly for consumers – a market-based alternative ensures that consumers only pay for what is actually needed.³

A Day-Ahead/Real-Time Market for PFR Is the Most Efficient Market-Mechanism.

¹ See paragraph 8 of FERC’s Notice of Proposed Rulemaking (NOPR) issued November 17, 2016: “*Essential Reliability Services and Evolving Bulk-Power System – Primary Frequency Response*” (Docket No. RM16-6-000). See also section 5.3 of the CAISO’s February 4, 2016 “*Frequency Response, Draft Final Proposal*.”

² See Section 2 (page 2) of CAISO’s comments filed with the FERC on April 25, 2016 in Docket No. RM16-6, the FERC proceeding addressing Primary Frequency Response.

³ SDG&E understands that other stakeholders, such as the California Wind Energy Association (CalWEA), share SDG&E’s view that PFR capability should not be a mandatory requirement.

SDG&E believes the most efficient market-based mechanism for assuring the necessary amounts of PFR are available to the CAISO Balancing Authority at all times, is for the CAISO to establish and operate day-ahead and real-time markets within which the CAISO would set and procure the amounts of PFR necessary to satisfy applicable NERC reliability standards. These amounts would be set to account for (i) the dynamic response of system load to frequency changes at any point in time, and (ii) the mix of generator governor settings and the amount of headroom available on generators that are expected to provide PFR outside of the market.⁴ These factors dictate the procurement of differing levels of PFR in different hours.

PFR procured on a longer-term basis -- e.g., annually -- requires long-term projections of these factors. Projections done a year ahead are necessarily less accurate than projections done a day-ahead and may result in over-procurement of PFR. Accordingly, SDG&E believes it would be preferable to find a way that external balancing authorities could offer PFR into the CAISO's day-ahead and real-time PFR markets, thereby obviating the need for annual forward procurement. It follows that options 1, 2 and 5 are not preferable in that these options contemplate annual forward procurement. Option 5 has the additional disadvantage that there is no way to minimize the cost of procuring PFR since procurement would take place in vastly different timeframes, one-year in advance and then on multiple day-ahead and real-time bases.

Option 3 is preferred in that it will (i) allow suppliers to express their willingness to provide PFR on the basis of day-ahead and real-time price/quantity offers, and (ii) minimize the overall cost of meeting all CAISO Balancing Authority requirements (energy, PFR, regulation capacity, spinning reserves, and non-spinning reserves) on a day-ahead and real-time basis.

Options 4 and 6 have the distinct drawback that there would not be a competitively determined market clearing price for PFR. The contemplated "settlement for service" would require some sort of administratively determined price. Administratively determined prices are less efficient than prices set through competition among prospective suppliers. Additionally, option 6 is problematic in that there is no way to minimize the cost of procuring PFR since procurement would take place in vastly different timeframes, one-year in advance and then on multiple day-ahead and real-time bases.

Option 7 appears to be non-viable in as much as (i) the CAISO has already determined that some amount of incremental PFR procurement is currently needed to satisfy applicable NERC reliability standards (i.e., the annual forward procurement already consummated with external balancing authorities), and (ii) there will be significant retirements of existing generation with PFR capability over the next five years.

2. ISO seeks stakeholder input on the proposed frequency response service specifications for fast frequency response, primary frequency response and fast regulation attached separately in the draft frequency control product specifications document found [here](#).

⁴ The CAISO should eliminate the mandatory requirement that existing generators with PFR capability enable such capability when operating. In a functioning market environment, only generators with PFR offers that clear the market would have an obligation to provide PFR; other generators would be free to provide PFR without compensation or could disable their PFR capability at their next opportunity.

SDG&E Comments

At this point in time, SDG&E does not believe there is a demonstrated need to specify “fast frequency response” or “fast regulation” services. Over the next ten years, levels of inertia (including synthetic inertia), coupled with the initial response of generators providing PFR, appear adequate to reverse first-swing dips before key reliability thresholds are reached. In addition, the CAISO has the ability to procure additional amounts of regulation capacity in its day-ahead and real-time markets should management of Area Control Error (ACE) become especially challenging.

- 3. ISO seeks stakeholder input on the proposed scope of services for which a procurement mechanism would be designed. The proposed scope shown in the product specification handout is that the ISO only needs to evaluate procurement of primary frequency response whether from external BAAs or internal resource and does not need to procure fast frequency response or fast regulation capable of providing the secondary response shown on slide 47 in the appendices to the working group presentation. If any stakeholders believe that the scope should include the fast frequency response or fast regulation services under its evaluation of a procurement mechanism please provide an explanation.**

SDG&E Comments

SDG&E does not believe the scope of services should be expanded to include “fast frequency response” or “fast regulation.” See SDG&E’s comments on question 2.

- 4. ISO seeks stakeholder input on whether load responsive devices can perform with a proportional response or does it require shedding load at a specific trigger point? Also, whether there has been any exploration of the concept of stopping non-critical processes for short periods has been evaluated?**

SDG&E Comments

A price/quantity offer-based day-ahead and real-time market for PFR would allow load responsive devices to participate on the same basis as generating resources. Load responsive devices would be subject to the same performance obligations as generators and would be required to provide the same Phasor Measurement Unit (PMU) data necessary to confirm performance during a triggering frequency event.

The load responsive device can express, via its price/quantity offer, the opportunity cost of stopping non-critical processes for short periods. While it may be informative for stakeholders if there is “exploration” of this “concept,” it is ultimately a commercial decision that load responsive devices need to make for themselves.

- 5. ISO seeks stakeholder input on whether pump storage hydro is pumping rather than generating would frequency control device perform with a proportional response or require shedding load at specific trigger points?**

SDG&E Comments

With a price/quantity offer-based day-ahead and real-time market for PFR, pump storage hydro operating in pumping mode would be treated the same as generating resources and the same as other load responsive devices. See SDG&E's comments on question 4.

- 6. ISO seeks stakeholder input on the statement made on Slide 15 of the ISO presentation, "Frequency control services require reserves above operating reserves that are not procured for RA". The ISO stated that it believes that resource adequacy or flexible resource adequacy capacity procured to ensure RA to ensure energy deliverability cannot be awarded frequency responsive reserves since these reserves cannot be released by ISO dispatch to ensure deliverability during peak or ramping needs. If any stakeholders hold a different belief, the ISO asks that additional information and explanation be provided to continue to move the dialogue forward.**

SDG&E Comments

SDG&E does not agree with the statement that "frequency control services require reserves...that are not procured for RA." This statement commingles two, essentially distinct, concepts. System and local Resource Adequacy (RA) are the CAISO's way of ensuring there is enough dependable generating capacity available to serve load under expected peak load conditions ("system" RA) and under extreme contingency conditions (N-1-1 contingency condition occurring during a one-year-in-ten summer weather event). Peak load conditions occur infrequently during the year, and extreme contingency conditions occur with considerably greater rarity. Load Serving Entities are required to demonstrate that they have acquired minimum amounts of system and local RA far in advance of actual operations.

PFR is the CAISO's way of ensuring there will always be enough frequency responsive generation available to return system frequency to nominal levels following a triggering frequency event, usually the sudden loss of generation. With a day-ahead and real-time market mechanism, PFR would be procured very close to actual operations.

If a generator with PFR capability is selected to provide system or local RA, it seems highly inefficient to then preclude that generator from also offering PFR in the day-ahead and or real-time market. The likelihood that a generator's PFR headroom will be needed to (i) restore system frequency in response to a triggering contingency event, at exactly the same time as (ii) it is needed to supply energy during a peak load condition or during an N-1-1 contingency condition, is vanishingly small.

Note that system RA requirements are not driven by generator outages. Generator outages are what usually triggers the need for PFR; i.e., system RA requirements will not overlap with PFR requirements.

Note further that nearly all of the N-1-1 contingency conditions giving rise to local RA requirements involve either the outage of a generator followed by 30 minutes within which to readjust the system *in anticipation of* a transmission facility outage, or the outage of one transmission facility followed by 30 minutes within which to readjust the system *in anticipation of* the next transmission facility outage. In other words, because local RA requirements are set by consideration of transmission outages which have no direct effect on system frequency, local RA requirements will not overlap with PFR requirements.