California ISO
Shaping a Renewed Future

Stakeholder Comments

Flexible Ramping Product Technical Workshop

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Southern California Edison (SCE) offers these comments regarding the California Independent System Operator's (CAISO) Flexible Ramping Product (FRP) Technical Workshop and related technical product design issues. SCE found the technical conference informative and useful and encourages the CAISO to continue to have such meetings to explore complex issues. SCE appreciates the significant time and thought the CAISO has put into its proposal, including the time spent on stakeholder dialogue at technical workshops.

SCE does not support going live with the full proposal in its current state. SCE supports the purpose of FRP, but the complexity and expanded scope of the proposal require a reevaluation of the implementation strategy. The FRP design should tie more closely to the CAISO's strategy for Variable Energy Resource (VER) Order 764 compliance, and detail formulation should wait until stakeholders understand and solidify any fundamental changes to the Hour Ahead Scheduling Process (HASP) and real-time markets. In broad strokes, we see the current FRP proposal as three highly interrelated "components": 1) replacing the current Flexible Ramping Constraint (FRC) in the real-time market with Flexi-Ramp Up (FRU) and Down (FRD), 2) co-optimization of Integrated Forward Market (IFM) and Residual Unit Commitment (RUC), and 3) introducing FRU and FRD in the day-ahead market.

Concerning the first component, the CAISO should explore the feasibility and benefits of implementing only portions of the FRP proposal at this time. Specifically, we see benefits in replacing the current real-time FRC with the proposed FRU structure (e.g. including demand curves and procurement based on the 5-minute "real-ramp"). However, we condition even this support on first 1) understanding how Order 764 will change the HASP and real-time markets, and 2) further exploring whether parties should be allowed to bid a non-zero price for FRU.

For the next components, IFM and RUC co-optimization, to the extent the CAISO procures additional flexibility products in the day-ahead market, we strongly support an Integrated Day Ahead Market (IDAM) process. A co-optimized Day-Ahead Market is central to any strategy for procuring sufficient flexibility: the IDAM should be viewed as prerequisite requirement before any such additional day-ahead procurement. This would include interim measures such as increased purchases of regulation or non-contingent spin. However, the current the IDAM proposal must be modified to prevent false "opportunity costs" associated with RUC from distorting all other IFM prices (e.g. energy, Ancillary

Services (A/S) and new flexibility products). As described *intra*, the only workable way we have found to achieve this is to treat RUC payments in a manner consistent with that used in all other ISO's.

Finally, regarding the day-ahead component of FRU/FRD, we have material concerns and questions and we do not support moving forward with implementation at this time. As detailed below, concerns include: 1) a core design that pays for intra-hour ramp needed simply to meet hourly energy schedule changes (as opposed to capacity payment targeting uncertainty and ensuring a robust commitment and dispatch), 2) lack of clarity on how day-ahead needs will be determined, and in particular how VER forecast vs. VER schedules will drive procurement targets, 3) the interaction of day-ahead FRP procurement and real-time FRP "buy back" and the impacts this will have on real-time price energy price formation, and 4) a discussion on whether bidding rules for day-ahead FRP Up and FRP Down should differ from real-time rules.

Consistent with our last comments, before going live with any component the CAISO should ensure the component is tested in a simulation space, and the result reviewed in order to "prove the concept" prior to committing to go-live.

1. **We should discuss staging FRP components. This allows the CAISO to activate components as they are finalized, identify trouble spots, and dynamically adjust the product.**
   The current FRP proposal has three broad components: the Integrated Day-Ahead Market, the real-time FRP design, and the day-ahead FRP design. These components interact, but we should explore the degree to which the CAISO can implement them separately. The components are in different stages of development, and allowing them to go live sequentially allows stakeholders to develop the product in a logical and controlled manner.

   Although they are not yet ready to go live, SCE is comfortable with the development path for the IDAM and real-time FRP, pending modifications and clarifications discussed in these comments. The structure for day-ahead FRP still requires significant work. Activating FRP in stages allows the CAISO to iron-out kinks and test the product in parts, without introducing a sea of change to the market in one fell swoop.

   a. **The first component of FRP to go live should be real-time FRP Up that is procured to meet real ramp needs using a bid curve.**
      The CAISO's experience with FRC, the flexible ramping constraint, can be translated to flexible ramping up product. The CAISO and its stakeholders have developed and vetted the concepts of using a demand curve to meet reliability needs, and procuring FRP to meet real-ramp requirements.

      The first stage of FRP should be priced at opportunity cost, and should be the FRP Up direction only. Before the CAISO allows bids or both products, stakeholders must ensure

that the Up product responds properly to price signals with the demand curve, and that the optimization procures sufficient ramp capability using the real-ramp metric.

This version of FRP is different from the current Flexible Ramping Constraint in several substantial ways. First, FRP will be awarded to dynamically scheduled resources, such as Hoover. Second, FRP will be included in the optimization's objective function. Finally, the new FRP will be priced and settled at five-minute intervals, rather than every fifteen minutes in Real Time Unit Commitment (RTUC).

b. **The next step is to round out the real-time product: allow generators to submit bids for both FRP Up and FRP Down, and procure both in real-time according to a demand curve. This step requires further discussion and clarification before implementation.**
After the RT FRP Up is implemented, tested, and evaluated, it is appropriate to activate the RT FRP Down, and allow units to bid on both products. With a solid infrastructure in place, the CAISO can activate and troubleshoot the FRP Down product, and implement bids.

However, both of these topics merit further discussion. The MSC meeting on October 19th will address the issue of whether to force units to bid FRP at $0. The driving question behind whether to allow positive FRP bids is, does awarding FRP to a unit force that unit to incur costs beyond what it is paid if it were to receive no FRP award? The meeting on the 19th will explore this issue.

The CAISO and stakeholders should spend time discussing FRP Down because all of the discussion so far has been using FRP Up as its example. Furthermore, the function of FRP Up is analogous to the function of existing products, such as Non-Contingent Spin. FRP Down is an entirely new product that merits further discussion before SCE is comfortable implementing it as a product in our market.

c. **Before procuring additional day-ahead flexibility, a properly design IDAM should be in place.**
As detailed below, the IDAM is integral to ensuring the availability of flexible resources, and to procuring that flexibility most efficiently. Regardless of the strategy the CAISO chooses to meet its needs, the IDAM will play a key role.

d. **The final step is to activate day-ahead procurement of FRP. However, significant design barriers remain before the CAISO should even consider activating DA FRP.**
Before SCE can support the procurement of FRP in the day-ahead timeframe, the CAISO must clarify at least three key issues. First, the day-ahead procurement target will depend on the amount of unpredictable generation that clears the DAM. The target will thus depend on a pre-process and the methodology is not clear for both need determination and how the optimization will split that need between DA and RT procurement. Second, currently day-ahead energy sales already include the implicit sale of some ramp (a unit

awarded different schedules in sequential hours has agreed to ramp between the two targets). Stakeholders must decide how to determine the need for ramp beyond the implicit sales, and how the optimization will identify and compensate the resources that provide that ramp. Third, FRP buyback rules and their ability to impact real-time prices must be explored and understood. Under the current formulation, buy-back rules hold the potential to severely distort real-time prices and bias the optimization to dispatch units in real-time only if they did *not* sell FRP in the day-ahead market.

2. **A co-optimized IFM and RUC should be considered a prerequisite for any strategy to increase procurement of day-ahead system flexibility. A proper IDAM allows the CAISO to procure flexibility in the most efficient manner practicable. However, for the IDAM to function properly, it must address false "opportunity cost" from the current RUC pricing approach.**
At the technical workshop, the CAISO identified the benefits of combining the IFM and RUC into a single process. Most importantly, the optimization would address economic and reliability constraints simultaneously instead of sequentially. This allows the resources that are committed for reliability purposes to provide flexibility instead of, say, sitting at PMin for the duration of the day.

   SCE agrees that the IDAM will provide great benefits and be instrumental in procuring flexibility in the DAM and at efficient prices. These benefits appear regardless of the strategy the CAISO ultimately chooses to procure flexibility, including increased purchases of ancillary services such as regulation or non-contingent spin. Efficiently positioning units will supplement any strategy.

   However, the current proposal has a key defect that threatens to undermine its benefits. That is, the IDAM will view RUC prices as potential "opportunity" costs. And when this happens, the "RUC opportunity costs" will link and increase the prices of all IFM products that must now forego this opportunity. Put simply, a high RUC price will be viewed as a large opportunity cost and, as a result, will likely inflate energy, A/S and FRP prices to reflect this lost opportunity. Herein lies the key defect in the design: RUC prices **do not** represent opportunity costs for the vast majority of resources in the market. (Recall that RA capacity is **ineligible** to receive a RUC payment.) Thus it is completely inappropriate to now allow RA units to, in effect, receive an indirect RUC payment via inflated energy and A/S prices. The CAISO must address this key defect before implementing any form of IDAM.

   We note that no other ISO/RTO prices RUC. Thus, the most eloquent, and judging by the agreement of practices everywhere else, the most appropriate solution is simply to not price RUC in the IDAM. The RA system already in place compensates resources for a must-offer requirement. Moreover, we expect RA to be expanded to include "flexibility" as well as system and local requirements. If this happens, the CAISO will arguably have the most comprehensive RA structure/must-offer requirement of any ISO/RTO. In light of this robust RA structure, there simply is no justification that the CAISO should continue to price RUC. Rather, just like all other markets, non-RA units that elect to participate in the CAISO markets will know they can be selected for any reason (energy, A/S,

flexibility or RUC). And just like all other markets, they will know that regardless of why they were selected, they are guaranteed bid cost recovery payments as a minimum.

3. **The final FRP design must wait on the CAISO's plan for VER Order 764 compliance. To ensure that FRP is durable and effective, it must comport with the timing and structure of the future market.** The current real-time proposal is engineered for the current 5-minute market. The day-ahead product is bought in hour-long blocks, and the real-time product is bought in RTD, every five minutes, for use in the five-minute market. The DA and RT products are different in their functions, too: units with DA FRP awards can be dispatched for energy in RTD, whereas units awarded FRP in real-time cannot receive energy awards that "eat into" their FRP awards. This example shows that the time period for which FRP is bought is important in determining how the product is used.

   Before settling on a design for flexible ramping product, we must understand the context in which the CAISO will use and procure it. Payments and prices must synchronize. If as part of 764 we move to 15-minute real-time markets, what does this mean for FRP? If we have both a 15-minute market and a 5-minute market, what will be the role of FRP? What is the granularity of the day-ahead market, will it remain hourly or will it too move to 15-minutes? Will HASP change in a way that allows interties to provide ramp? The answer to these and other questions will incorporate into a plan that combines FRP with VER Order 764 compliance.