

Stakeholder Comments

Contingency Modeling Enhancements Second Revised Straw Paper

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The following are Southern California Edison’s (SCE) comments on the California Independent System Operator’s (CAISO) Second Revised Straw Proposal (the CAISO Proposal)¹.

SCE appreciates the opportunity to present SCE’s Regional Flexibility Proposal² (the SCE Proposal) on the March 20, 2014 stakeholder call and the CAISO’s openness to discuss alternatives to its own proposal. Also, SCE recognizes and agrees with the CAISO on the importance of grid reliability as the CAISO and the stakeholders are evaluating different options relevant to this initiative.

Below, SCE provides its evaluation of the CAISO Proposal along with its own proposal, in the spirit of fostering stakeholders’ discussion on the topic and ultimately leading to an improved outcome for this stakeholder initiative. SCE also offers specific comments regarding the CAISO Proposal at the end.

1. Comparison of SCE proposal and CAISO proposal.

As discussed in the March 20, 2014 stakeholder call, a comparison of the SCE Proposal and the CAISO proposal may be desired to illustrate the pros and cons of each proposal. Below SCE offers this comparison in the following aspects:

a. Price formation and price transparency

Since in the SCE Proposal, the LMP price formation stays same as today, there is no impact to the LMP price formation. The value of LMPs may be inflated (or not) when a regional flexibility constraint binds, which may be similar to the interaction between LMP and A/S prices today. However, the core LMP pricing structure is kept intact. There is little or no impact on the price transparency under the SCE Proposal.

In comparison, the CAISO Proposal adds an additional component to LMP. This additional component is a capacity price, and is a result of binding corrective constraints, which are used to procure “corrective capacity”, not energy. This additional component is also temporal in nature, since the corrective capacity is not needed in the current interval, based on which other components of LMPs are priced; rather, the corrective capacity is needed in the next 30 minutes. Under the CAISO Proposal, the core LMP price formation is now fundamentally changed. One consequence of the change is that it may have adverse impacts on CRRs and congestion management in general. Since in the CRR market, which is a financial market, the

¹ <http://www.aiso.com/Documents/SecondRevisedStrawProposal-ContingencyModelingEnhancements.pdf>

² http://www.aiso.com/Documents/SCE_Proposal-ContingencyModelingEnhancements.pdf

ramp rates of resources are not considered, hence, the concept of “corrective capacity” may not apply. However, if a corrective constraint binds in the day-ahead market (DAM), it will expose market participant financial risks, since CRRs are not designed to hedge a temporal congestion tied to “corrective capacity”³. Further when a corrective constraint causes a preventive constraint to not bind, the value of a participant’s CRR portfolio may also change, regardless of the cost the participant may have spent in obtaining those CRRs in the CRR market.

Because the CAISO Proposal introduces the new nodal capacity price (aka LMCP) and a new time dimension in the LMP calculation, the price transparency may suffer. Due to the complexity of the CAISO Proposal, one may not understand why the prices are what they are.

b. RA payment

Under the SCE Proposal, RA resources are paid a regional price adder through existing products in the DAM. Non-RA resources are paid RUC prices if they are needed in RUC. The RA payment structure is kept intact under the SCE Proposal, to ensure a fair compensation to resources and a fair cost to consumers.

In comparison, under the CAISO Proposal, RA resources will be paid a nodal capacity price (LMCP) in the DAM, regardless whether it may or may not be needed in the subsequent RUC run. This will incur additional costs to consumers and causes inconsistencies. For example, if a RA resource is paid LMCP in the DAM but it is later found out that RA resource may not be needed in RUC, what is the justification for paying the RA resource in DAM? Further, because consumers already paid the RA resources through RA contracts, what is the justification to pay them again in the DAM if they are not selling any existing product?

c. Effectiveness in addressing overall EDs and MOCs

The SCE Proposal ensures regional flexibility, whether it is driven by System Operating Limits (SOL) need, or by other needs. Given that SOL-related Exceptional Dispatches (EDs) are only a small portion of overall EDs, the SCE Proposal has the potential to reduce not only SOL-related EDs, but also other EDs. Similarly, the SCE Proposal has the potential to reduce Minimum Online Capacity constraints (MOCs), whether they are SOL-related or not, as long as they can provide flexibility in the region. Further the SCE Proposal has the potential to align flexibility regions with areas covered by MOCs, which can further reduce MOCs.

While the CAISO Proposal has the potential to reduce SOL-related EDs, it may not be able to reduce other types of EDs. Similarly, the CAISO Proposal may have limitations in reducing non-SOL-related MOCs, since by design the CAISO Proposal is not based on regional capacity procurement.

d. Demand response and other emergency tools

Since an N-1 event usually leads to an emergency situation for the grid, demand response and other emergency tools must be considered. Although both Proposals consider demand response as part of the solution, the SCE Proposal is more straightforward and a more direct

³ It’s well known that CRRs are designed to hedge congestion in the DAM related to “flow” on a transmission path. Since corrective capacity does not create any flow on the line, by design, CRRs cannot hedge congestion due to corrective capacity.

approach, as it looks at the demand response and other emergency tools first. Only if these emergency programs cannot provide sufficient relief, will it procure through the market. This ensures incentives to the demand response program. In comparison, it is not clear how the demand response and other emergency tools are modeled under the CAISO Proposal. In general, if the requirement to resolve N-1 issues is unknown, as in the CAISO Proposal, it is much more difficult to figure out the relationship between the size of a demand response program and a flexibility need to resolve SOL issues.

e. Robustness and accuracy

The SCE Proposal does not co-mingle financial instruments (e.g., virtual bids) with physical reliability needs. Because of this, the impact of financial instruments, whose volume can be volatile, driven by other market factors, can be minimized. In this sense, the SCE Proposal is more robust.

CAISO Proposal may provide a more accurate solution IF everything is as forecasted AND there is no adverse impact from financial instruments. However, although the CAISO and market participants may be able to improve the day-ahead forecasts, the day-to-day volatility of financial instruments is out of the CAISO's control (or anyone's control).

f. Market power mitigation

Both Proposals would require market power mitigation, which is one of key elements in any market design. Market power mitigation requires more sophisticated measures under the CAISO Proposal, because it involves nodal, temporal (such as positional withholding), and dual energy and capacity nature.

For a more comprehensive comparison between the two proposals, please see the attachment.

In addition to the comparisons described above, SCE offers the following specific comments on the CAISO Proposal.

2. Specific comments on the CAISO Proposal

a. **A cost benefit analysis of the CAISO Proposal should be performed**

If the CAISO decides to move forward with its Proposal, SCE requests a cost benefit analysis of its Proposal. Since SOL-related EDs represent a small portion of all EDs and a fraction of energy in the current market, any proposed changes and subsequently the cost impact must be understood to justify such changes. The probability of the occurrence of N-1-1 events should be considered in this cost benefit analysis.

b. **A policy decision on go or no-go should be contingent on a satisfactory market simulation and prototype results**

Although the CAISO Proposal may turn out be the best option eventually, the CAISO, and the stakeholders, should not make the policy decision on go or no-go without a satisfactory market simulation and prototype results. The prototype results should cover both typical day-to-day scenarios and more constrained scenarios (for example with important transmission outages with stressed grid conditions).

c. **An extended market simulation and test period, such as three to four month period, is needed**

SCE sees value in the CAISO Proposal, for example, a tool may be developed based on the CAISO Proposal to increase real-time situational awareness for Grid Operators. The tool can be an addition to real-time situational awareness tools that CAISO may currently have, which are separate from the market clearing software.

The CAISO has indicated during the March 20, 2014 Stakeholder call that the prototype results will be based on one or two simulation cases. SCE feels that one or two cases may not be sufficient to fully test the performance of the CAISO Proposal. Therefore, SCE requests that the CAISO extend the study period to three to four months, during which the CAISO can run the tool parallel to the production systems.

d. **Market power mitigation should assess the importance of a cross-product market power mitigation in the context of co-optimization between energy, ancillary services (A/S), and flexibility**

SCE appreciates the effort of revising the current LMPM to accommodate the proposed changes in the CAISO Proposal.

Currently the locational market power mitigation (LMPM) only applies to energy bids. However, the optimization engine co-optimizes energy, A/S, and flexibility in clearing the market. Further, an opportunity cost exists if a resource is needed to be on for A/S or flexibility needs. Although it may be appropriate to compensate the resource the opportunity cost under today's market design, there is no market power mitigation test on the opportunity cost in the context of the co-optimization.

The CAISO and the DMM should look into whether the current LMPM, which is an energy-only mitigation scheme, is effective to mitigate resource bids when opportunity cost is actually the dominant factor in setting the clearing prices. The issue is important, especially as the needs/demand for A/S and flexibility may increase with increasing intermittent resource integration.

e. **The CAISO needs to evaluate whether there is the potential of underutilization of transmission system under the CAISO Proposal.**

By introducing corrective constraints, the market solution may be very conservative such that transfer flow between the regions may be significantly lowered down from the today's level⁴. For example, on a daily basis, the optimization may reduce the flow on an intertie if it is cheaper to do so to meet corrective constraints, rather than keep the flow at the today's level and including enough corrective capacity in the system. A consequence of this is underutilization of transmission system and increasing cost to consumers. The CAISO should evaluate such potential outcomes under its Proposal.

⁴ As a symptom, corrective constraints could cause preventive constraints to not bind, because corrective constraints could be hit first before preventive constraints bind, if corrective constraints are more difficult to meet in the optimization. In comparison, only preventive constraints exist in today's market and thus transmission capacity between regions may be better utilized today compared to it would be under the CAISO Proposal.

Attachment

Table: Matrix of comparison of the SCE Proposal and the CAISO Proposal

	SCE Proposal: Regional Flexibility	The CAISO Proposal
Complexity	Simple extension of current market, regional concept	Complicated approach (nodal, temporal, virtual, etc.)
Procurement target	Through off-line study finds reasonable targets	No specific target. Non-transparent on how a nodal target may be set by optimization and how it changes
Create a new product?	No	Yes. Nodal capacity product
Use of existing products	It fully utilizes, and improves upon, the existing products and proposed Flexi-ramp	This is in addition to existing products. Certain existing products cannot be used toward N-1 SOL requirement
Reflects reality of how grid operators will respond?	Yes. In reality all available capacity (reserves, demand response, emergency programs, Flexi-ramp) will be used to address N-1 SOL needs	Partially. Flexi-ramp today can't be used to address N-1 SOL needs. The capacity procured on a nodal basis is not used for any other purpose
Solution robustness under resource deviation (e.g. wind)	Wind deviation can be factored into the procurement target thru off-line study	The solution is a precise engineering solution assuming the wind does not deviate and all other conditions materialize exactly as forecasted
Changes to current LMP formulation?	No	Yes. Adding temporal congestion component to the LMP formulation
Properly addresses virtual bids	Yes	No. A 4000MW virtual flow can be accountable for "meeting" the requirement and paid for that
Impact to energy dispatch	Energy is dispatched under normal transmission ratings as today	In every interval (Day-ahead and Real-time), energy is dispatched as if an N-1 has occurred and the grid must now recover to derated limits
Market Power Mitigation	Regional competitiveness can be assessed for market power mitigation purpose	Complicated measures are needed to address nodal, temporal and dual transmission and capacity aspects
Double pays RA units for capacity?	No. Only pays units selling existing products	Yes. Pays a locational capacity price to all units providing new "product"