Stakeholder Comments

CAISO Generator Contingency & RAS Modeling Revised Straw Proposal

Submitted by	Company	Date Submitted
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SCE appreciates the opportunity to comment on the California Independent System Operator (CAISO) Generator Contingency & Remedial Action Scheme (RAS) Modeling Revised Straw Proposal (Proposal)[1]. In the Proposal, the CAISO is proposing to (1) explicitly model RAS in the market such that a RAS unit may receive a higher LMP compared to a non-RAS unit at same location, and (2) explicitly model generator contingencies such that transmission capacity can be reserved to prevent overloading should a generator loss occur.

As currently written, SCE does not support the Proposal for issue 1 (modeling RAS in the market) as it can lead to unjustified revenue for RAS units inconsistent with the intent of the use of RAS and the generation interconnection process. The Proposal can lead to false incentives by valuing RAS more than network upgrades, thus has the potential to distort the interconnection process and RAS operations. Regarding the Proposal's treatment of issue 2 (modeling generator contingency), SCE finds merits in the approach; however, SCE believes issues around Virtual Bids and Congestion Revenue Rights (CRR) should be further explored.

1) There is a disconnect between the generation interconnection process and the Proposal in how RAS is treated

The CAISO generator interconnection process (GIP) can identify either the option of physical upgrades or the option of certain upgrades without physical upgrades, including the use of RAS, for a resource to reliably interconnect to the grid. Typically the option of physical upgrades is more expensive than the option of installing RAS. Once the option of physical upgrade is chosen, the resultant capacity increase to the grid is available to all resources at the same location leading to all resources at that location receiving the same LMP[2].

In comparison, the use of RAS enables generation to physically interconnect without additional physical upgrades to the transmission system. The RAS enables new resources to physically interconnect once the amount of resources not on a RAS in a certain area exceeds the available transmission capacity. The whole reason a RAS is implemented is to address the reliability concerns that would otherwise exist without the RAS and without additional physical upgrades to the transmission system. Said differently, the use of a RAS substitutes for the physical upgrades to the transmission system that would otherwise be needed to address reliability concerns related to adding more and more

[1]The CAISO Generator Contingency & RAS Modeling Revised Straw Proposal, available at http://www.caiso.com/Documents/RevisedStrawProposal-GeneratorContingencyRemedialActionScheme.pdf

[2] There might be slight difference in LMP due to any difference in losses which is not the focus of this discussion.

generation to the system. To date, the use of RAS has always been selected as the appropriate "upgrade" to the system because the use of RAS has been found to be more economical as compared to implementing physical upgrades to the transmission system. Such determination has been historically made by comparing the capital cost of a RAS against the capital cost of physical upgrades to the transmission system. In simple terms, adding generation to a constrained area, and not adding transmission, will only cause or exacerbate congestion. When a RAS is a necessary condition of interconnection, it should not be credited with improving reliability or increasing capability the same way as physical upgrades.

The fundamental concept of the CAISO Proposal is flawed in that it will reward interconnecting generator customers who cause congestion. Following an interconnection study, a unit with a RAS would cause congestion without the RAS, but under the CAISO Proposal, the unit will now receive higher LMPs and be compensated more because the RAS "resolved" the congestion. A decision to now reward late coming generators who can only be interconnected with the use of a RAS would absolutely change the economics which could have resulted in requiring physical upgrades to the transmission system instead of the use of a RAS.

Further, SCE's interconnection process ensures that all generation (that is not part of a RAS) will be able to generate even under an N-1 condition. Should an N-1 occur in real-time, units armed with a RAS would trip (if necessary) and the remaining generation would have sufficient transmission available to continue production. The CAISO's examples, and apparently the conceptual framework behind the proposal, don't seem to acknowledge this important starting point (e.g. that the interconnection process allows non-RAS generation to continue production even under an N-1 condition). If this is the case with the other utilities, it is unclear to SCE if the proposal is even necessary.

2) The Proposal can lead to unjustified revenue for RAS units inconsistent with the use of RAS

The price formation of the Proposal is such that a RAS unit may receive a higher LMP than a non-RAS unit at the same location, regardless of whether there is a RAS operation in real time or not. Regardless of the frequency of actual occurrences of RAS events, the RAS unit would keep collecting the revenue as long as the RAS is modeled under the Proposal. It is inappropriate to compensate the RAS unit with a higher LMP as it would not lead to any improvement to the underlying physical system.

The intent of using a RAS is for reliability reasons such that when a transmission emergency occurs, the unit equipped with a RAS would automatically trip as a measure to protect reliability. The CAISO should evaluate whether the Proposal to compensate RAS units with higher LMPs is necessary as it appears the RAS would automatically trip should an emergency occur. Such tripping has effectively been compensated by the resource not being obligated to fund physical transmission system upgrades.

3) While the proposal to model generator contingencies has some merits, it should be further evaluated to avoid any impact to the market

Under the Proposal, generator contingencies will be modeled and priced within the market. While there are some merits in this approach, apparently, the Proposal can lead to multiple prices at a single location. Specifically, each generator contingency can lead to a unique price for the generator, while the shadow price of the generator contingency may not impact the price for load at the same location.

The CAISO should clarify whether generator contingency constraints would apply to Virtual Bids

For a physical generator that is considered as a contingency, the Proposal would enforce its contingency constraint such that enough transmission capacity is reserved and the system is still secure with the loss of the generation. This constraint would also affect the price the generator receives[3]. The issue of how Virtual Bids are treated under the Proposal should be further evaluated. For instance, if there are only virtual bids, and no physical bids, at the location of the physical generator in the Day-Ahead Market, should the physical generator contingency constraint be enforced even without the physical generator being committed under the Proposal?[4]

4) SCE agrees with the CAISO that any impact to the CRR market due to this initiative should be addressed within this initiative

As the CRR market consistently experiences revenue deficiencies, any design that can exacerbate such deficiencies should be avoided. As recognized by the CAISO, the proposal of generator contingency modeling will exaggerate the CRR revenue deficit if the impact to the CRR market is not addressed.

Among the two options listed by the CAISO, SCE believes the approach of using conservative ratings, such as through the use of a derated global scaling factor, ultimately may not resolve the issue. The issue is not simply about the absolute value of the limit but rather consistent modeling between the Day-Ahead Market (DAM) and the CRR Market. In many aspects, the approach of directly modeling generator contingency constraints in the CRR market is preferred to the approach of using conservative ratings. However, the CAISO should clarify the selection criteria for generator contingencies and whether the timeline difference between the Day-Ahead and CRR markets would cause any issue under the proposal.

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[3] This can be seen from the CAISO example (Page 18, CAISO Presentation). G1 receives $40/MWh today without its contingency constraint but would receive the price at $35.29/MWh under the Proposal.
The CAISO Presentation is available at: http://www.caiso.com/Documents/Agenda_Presentation-GeneratorRemodeling_RemedialActionSchemeRevisedStrawProposal.pdf

[4] Using the same CAISO example (Page 18, CAISO Presentation), scenarios can be developed for illustration. In the example, suppose G1 submits 1500MW virtual supply without submitting physical bids in the DAM. If its contingency constraint would be applied to this virtual bid in the DAM, then when G1 continues to stay offline in RTM (due to its RT bid, outage, etc.), it would imply the constraint would not need to be enforced in the RTM as the unit is not committed. This can result in modeling differences between the DAM and RTM. If instead, the G1 contingency constraint is not applied to the virtual bid in the DAM, then G1 will get paid at a price without the constraint being enforced for its virtual bid. Even if G1 produces in the RTM and the constraint is enforced in RTM, G1 essentially escaped the price signal in RTM through the use of virtual bidding.