

Comments on the Generator Contingency & RAS Modeling – Revised Straw Proposal

Department of Market Monitoring
April 7, 2017

Summary

The California ISO Department of Market Monitoring (DMM) appreciates the opportunity to comment on the ISO's Generator Contingency & RAS Modeling Revised Straw Proposal (Straw Proposal).¹

DMM supports the direction the ISO is taking on modeling generator contingencies and remedial action schemes (RAS) in the day-ahead and real-time markets. The ISO's day-ahead and real-time proposal will allow the market model to efficiently manage generator contingency and RAS constraints and is consistent with standard LMP market design.

However, the interaction between the CRR auction and the generator contingency and RAS modeling will create substantial risk for transmission ratepayers. Neither of the ISO's proposals for addressing these interactions will alleviate this risk. As explained below, under both of the ISO's proposals, a CRR auction participant will be able to receive CRR payments at day-ahead prices for contracts the participant did not purchase in the CRR auction.² This will create significant risk for transmission ratepayers because under the current CRR auction design, transmission ratepayers are obligated to make the payments on these free contracts.

This problem is not caused by the ISO's proposed design of generator contingency and RAS modeling. Instead, this problem is caused by the ISO's current CRR auction design. The ISO's proposal for modeling generator contingencies and RAS in the day-ahead and real-time markets represents a clear reliability and efficiency improvement to the ISO's spot markets. DMM strongly recommends that the ISO address the structural problems in the CRR auction design that are impeding the ISO's development of these kinds of significant enhancements to the ISO's spot markets.³ DMM continues to recommend that the ISO change the CRR auction

¹ See *Generator Contingency & RAS Modeling – Revised Straw Proposal*, March 15, 2017:

<http://www.caiso.com/Documents/RevisedStrawProposal-GeneratorContingencyRemedialActionScheme.pdf>.

² Throughout these comments we refer to the portion of a CRR that an auction participant pays for based on the shadow price of a particular auction constraint as a "contract" rather than a "congestion revenue right". This is because the product being bought in the auction is a contract for a purely financial swap. It is not a right to congestion revenues or to the physical transmission system.

³ For more information on the structural problems in the design of the CRR auction, see:

<http://www.caiso.com/Documents/DMM-WhitePaper-Shortcomings-CongestionRevenueRightAuctionDesign.pdf>.

The ISO is considering adjustments to the CRR auction design as part of the "CRR Auction Efficiency" stakeholder process. This initiative will begin with a working group meeting on April 18, 2017. For more information, please see the Market Notice for this meeting at:

http://www.caiso.com/Documents/CongestionRevenueRightsWorkingGroupMeetingRescheduled_041817.html

design so that the ISO is not using an approximation of the transmission network model to determine the quantity of CRR contracts to sell on behalf of transmission ratepayers at a \$0 reservation price.⁴ Addressing this structural problem with the CRR auction design will alleviate the financial risk that the CRR auction currently exposes transmission ratepayers to, and it will prevent valuable enhancements to the ISO spot markets from increasing transmission ratepayers' exposure to losses from the CRR auction.

I. Day-ahead and real-time generator contingency & RAS modeling

The ISO proposes modeling preventive transmission constraints with the shift factor of a contingency or RAS generator changed to a generator flow factor. The generator flow factor accounts for generator and system conditions during a contingency or RAS event. The proposed preventive modeling is very similar to current preventive constraint modeling and follows directly from the ISO's objectives. The ISO's proposal will allow the day-ahead and real-time markets to efficiently manage generator contingency and RAS constraints and is consistent with standard LMP market design.

The proposed congestion pricing is simply an application of the current congestion pricing. Therefore the ISO does not need to modify the market power mitigation design. The mitigation process can treat the proposed constraints in the same manner as current constraints.

II. Congestion revenue rights with generator contingency & RAS modeling

The ISO outlines two proposals for altering the congestion revenue right (CRR) modeling if the Straw Proposal were implemented in the day-ahead market. The ISO's first proposal is to model the expected generator contingency and RAS case constraints in the CRR models. The ISO's alternative proposal is to lower limits on transmission constraints already modeled in the CRR auction in order to maintain revenue adequacy. Both of these proposals leave significant risks for transmission ratepayers. As explained below, under both proposals a CRR auction participant can receive payments at day-ahead prices for contracts that the CRR auction participant did not purchase in the CRR auction.

The alternative CRR proposal

We start with the alternative proposal to illustrate that maintaining revenue adequacy does not address the financial risk that the current CRR auction design exposes transmission ratepayers

⁴ See *2015 Annual Report on Market Issues & Performance*, Department of Market Monitoring, May 2016, p. 18: <http://www.caiso.com/Documents/2015AnnualReportonMarketIssuesandPerformance.pdf>.

to. The current CRR auction design is problematic for transmission ratepayers when combined with the generator contingency and RAS modeling because the current CRR auction design will not maintain consistency between the contracts that are bought in the CRR auction and the contracts that are settled in the day-ahead market.⁵ The alternative proposal, while maintaining revenue adequacy, fails to solve this underlying problem. The alternative proposal allows auction participants to continue receiving contracts without paying for them. At the same time, the alternative proposal restricts the amount of contracts that can be purchased by participants who actually pay for the contracts.

Table 1 shows data from the ISO’s example of CRR issues.⁶ The example concerns a transmission constraint called T2. The table includes the auction and day-ahead market shift factors to the T2 constraint; cleared CRR megawatts without action taken and under the alternative proposal; and megawatts of T2 contracts purchased in the auction and settled at day-ahead prices under the no action and alternative proposal scenarios.

Table 1. CRR auction and ISO alternative proposal

CRR	T2 Shift Factor		Cleared CRR MW		No Action T2 MWs		Alternative T2 MWs	
	Auc	DA	No action	Alt.	Auc 1	DA 1	Alt. Auc	Alt. DA
A1-L	0	0.94	1,500	1,500	0	1,414	0	1,414
A2-L	0	0	750	750	0	0	0	0
B-L	1	1	750	86	750	750	86	86
			Total		750	2,164	86	1,500

Paid for contracts not purchased
Still paid for contracts not purchased

When no action is taken the CRR auction clears 1,500 MW of A1-L CRRs and 750 MW of B-L CRRs. The A1-L CRRs purchase 0 MW of forward contracts to constraint T2 in the auction. The B-L CRRs purchase 750 MW of T2 contracts. In the day-ahead market the A1-L CRR is paid for 1,414 MW of T2 contracts because the shift factor is 0.94 instead of 0.00. A1-L is paid for 1,414 MW of T2 contracts that it never purchased because the CRR is not consistently defined.

In the ISO example there is also CRR revenue inadequacy as payments to CRRs exceed day-ahead congestion rent collections. The ISO collects rent from day-ahead schedules for the

⁵ Here we ignore whether the ISO should be offering financial contracts on behalf of ratepayers at all. DMM has recommended that forward price swaps be traded only by willing parties in a market, rather than having the ISO offer contracts on behalf of ratepayers at \$0 prices. See 2015 Annual Report on Market Issues & Performance p. 18: <http://www.caiso.com/Documents/2015AnnualReportonMarketIssuesandPerformance.pdf>.

⁶ Revised Straw Proposal starting on pp. 55.

1,500 MW day-ahead market limit of the T2 constraint. However, the ISO pays out 2,164 MW worth of CRR contracts over the constraint.

The ISO alternative proposal maintains revenue adequacy by reducing the T2 limit to 86 MW in the auction. Lowering the limit does not reduce the quantity of A1-L CRRs available in the auction. Lowering the auction limit of constraint T2 also does not stop A1-L CRRs from being paid for 1,414 MW of T2 contracts that the participant who procured A1-L CRRs never purchased. Instead the lower T2 limit reduces the quantity of B-L CRRs that can be purchased in the auction. The ISO's alternative proposal highlights that focusing on revenue adequacy does not make CRRs consistently defined between the auction and day-ahead market. This leaves transmission ratepayers exposed to monetary losses from inconsistently defined CRRs.

The ISO's "optimal" CRR proposal

The ISO's "optimal"⁷ proposal, which aims "...to accurately align the CRR market and the day-ahead market and mitigate potential revenue adequacy,"⁸ also fails to solve the underlying problem. The proposal fails because, as the ISO stated on the March 22nd stakeholder call, the contingency and RAS periods do not align with the monthly and quarterly CRR settlement periods. This non-alignment creates an inconsistency between the CRRs as auctioned and as settled in the day-ahead market.

On the stakeholder call the ISO said it intended to take the most conservative approach for modeling RAS cases in the CRR auction. The ISO views the problem as one of revenue adequacy in which they can choose a modeling approach that releases the lower amount of contracts in the auction. But the problem is not maintaining revenue adequacy. The problem is maintaining consistency between CRRs as defined in the auction and as settled in the day-ahead market. There is no conservative approach when the RAS and CRR settlement period are not aligned. Choosing whether or not to model a RAS in the CRR auction simply changes the strategy that could be employed to take advantage of the misalignment.

Table 2 shows the net shift factors to T2 for CRR source and sink combinations from the ISO's Straw Proposal RAS examples. The table shows shift factors with and without the RAS modeled. Assume that the RAS is modeled in the day-ahead market for only half a month.

⁷ *Generator Contingency & RAS Modeling – Revised Straw Proposal Presentation*, March 22, 2017 pp. 30
http://www.caiso.com/Documents/Agenda_Presentation-GeneratorRemodeling_RemedialActionSchemeRevisedStrawProposal.pdf

⁸ Revised Straw Proposal pp. 59.

Table 2. T2 Shift factors with and without the RAS modeled

CRR	T2 Shift Factor	
	No-RAS	RAS
A2-A1	0	0.972
A1-B	1	0.028
A1-A2	0	-0.972

If the ISO *does not* model the RAS in the CRR auction a participant could buy 1 MW of A2-A1 CRRs. This would result in the purchase of 0 MW of T2 contracts. In the half of the month where the RAS *is* enforced in the day-ahead market, the participant would be paid for 0.972 MW of T2 contracts that the auction participant never purchased.

If the ISO *does* model the RAS in the CRR auction a participant could buy a 1 MW CRR from A1-B. This would result in the purchase of 0.028 MW of T2 contracts. In the half of the month where the RAS *is not* enforced in the day-ahead market the participant would get paid for 1 MW of T2 contracts when the participant only paid for 0.028 MW of T2 contracts. Therefore, whether or not the ISO models the RAS in the CRR auction, for half the month the participant would be paid for 0.972 MW of T2 contracts that the participant never purchased.

The ISO’s proposal for addressing the interaction between the current CRR auction design and the proposed generator contingency and RAS modeling design does not resolve the financial risk that transmission ratepayers will be exposed to. Choosing how to model the RAS in the auction does not solve the problem because the RAS modeling is not the source of the inconsistency between the CRRs that auction participants buy in the auction and the CRRs that participants get paid for in the day ahead market. The sources of the inconsistency are a CRR settlement period that does not align with the operation of the RAS and a CRR product that is defined by a set of constraints modeled in the auction rather than being simply defined by the two nodes on whose day-ahead price differences the CRR is actually paid.