

**Comments on the Resource Adequacy Availability Incentive Mechanism  
Modification Draft Final Proposal  
Department of Market Monitoring  
October 3, 2017**

**Summary**

The California ISO Department of Market Monitoring (DMM) appreciates the opportunity to comment on the ISO's Resource Adequacy Availability Incentive Mechanism (RAAIM) Modification Draft Final Proposal (Proposal).<sup>1</sup>

DMM agrees with the ISO that the proposed changes to the RAAIM calculations are substantive and will need to be submitted to the ISO Board and to FERC for approval.

DMM appreciates that the ISO finished defining its proposal by using equations in the Draft Final Proposal issued on September 21. Given that the details of the ISO proposal were only clarified in the Draft Final Proposal issued on September 21, DMM has sought to review the proposal as quickly as possible and provide these comments. Now that stakeholders have a defined proposal to assess, DMM recommends that the ISO consider stakeholder feedback on that proposal and incorporate the feedback into an improved final RAAIM design.

The ISO Proposal fixes the inconsistencies that created the need for the RAAIM Modification Initiative. But the ISO's proposed RAAIM calculations still have several inconsistencies. While these inconsistencies may be mild compared to those in the current RAAIM calculation, DMM believes the proposed approach could be improved. At the end of these comments, DMM is providing an alternative potential RAAIM calculation which does not seem to have these inconsistencies.

**I. Single penalty price is not ideal but may be only currently feasible method**

The ISO Proposal maintains a single penalty price for multiple RA products. As DMM and SCE pointed out in previous comments, using a single penalty price will necessarily result in some logical inconsistencies.<sup>2</sup> However, the ISO has not been able to use the available RA data to determine what reasonable separate penalty prices would be. Calculating RAAIM charges using

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<sup>1</sup> *Resource Adequacy Availability Incentive Mechanism Modification: Draft Final Proposal*, September 21, 2017: <http://www.caiso.com/Documents/DraftFinalProposal-RAAIMCalculationModifications-clean.pdf>.

<sup>2</sup> *SCE comments on Resource Adequacy Availability Incentive Mechanism Modification White Paper* September 15, 2017: <http://www.caiso.com/Documents/SCEComments-RAAIMCalculationModifications-WhitePaper.pdf>.  
*DMM comments on Resource Adequacy Availability Incentive Mechanism Modification White Paper* September 19, 2017: <http://www.caiso.com/Documents/DMMComments-RAAIMCalculationModifications-WhitePaper.pdf>.

a single penalty price may be the only currently feasible method. The RAAIM modifications should aim to reduce the effects of these inconsistencies as much as possible.

## **II. ISO proposal solves main concern of initiative, but creates other potential inconsistencies**

The ISO Proposal fixes the inconsistencies that led to disproportionate effects from small amounts of flexible RA showings on overall RAAIM charges. But there are still some inconsistencies with the ISO Proposal. The ISO Proposal tries to maintain the concept of not separating RA products in order to maintain a single penalty price policy. However, the ISO calculates availability percentages and unavailable RA separately by RA product.

As a result of this approach, under the ISO's proposal a resource can receive both a RAAIM charge and incentive payment during the same month. Further, a resource may have a total RA availability percentage (across RA products taken together) that is above the penalty threshold. But by separating the availability calculations, one RA product may be below the penalty threshold while the other is below the incentive threshold. This resource would face a RAAIM charge even though its total RA availability is above the penalty threshold. Conversely, a resource whose total RA availability is below the threshold for an incentive payment may receive an incentive payment when availabilities are calculated separately.<sup>3</sup>

A third issue occurs when a resource sells both system and flexible RA (or local and flexible RA). If the resource does not provide the flexible RA it will be treated as if it also does not provide the system RA. This will occur even if the resource does provide the system RA.

Provided below is an alternative potential calculation of the RA availability for RAAIM assessment for the ISO and stakeholders to consider. DMM thinks this alternative calculation resolves some of the inconsistencies of the ISO's proposed calculation while still meeting the ISO's objectives and maintaining a single penalty price paradigm.

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<sup>3</sup> It is unclear why a resource that provides less than what it was contracted to provide should receive additional payments, even if the resource only provides a little bit less than it was contracted to provide. However, review of the incentive payment concept does not appear to be in the scope of the RAAIM modifications initiative.

### III. Alternative RAAIM penalty and incentive payment calculation

The RAAIM formulation below details a potential calculation of RAAIM penalty charges and incentive payments. We believe this potential calculation meets the ISO's goals in the RAAIM Modification initiative, which include maintaining the questionable paradigm of using a single penalty price for multiple products. The ISO's goals include:

- Products are measured at a daily level negating effects from hour differences between product definitions.
- The accounting of product obligations and availability is proportionate based on megawatts.
- Penalty charges or incentive payments are assessed on monthly measures of availability.

#### Description of alternative RAAIM penalty and incentive payment calculation

- a:* Calculate the average available RA MW for each product daily. Divide by monthly product days. This availability will not weigh RA products with more offer hours more heavily than RA products with less offer hours.
- b:* Add the daily availabilities for all RA products for the generator. This turns all RA product availability into a single generic RA availability weighted by product days.
- c:* Add average daily product obligations, divided by product days, for each product to get the total daily gross MW of RA requirements. This treats all RA products obligations as a single RA product obligation.
- d:* Divide the total available RA by the total RA obligations to get the daily total percent of all RA obligations that were available. This treats all RA products obligations as a single RA product obligation.
- e:* Find the maximum of the average daily RA product obligations, weighted by product days, across all RA products. This is the "net" RA requirement assuming all RA products overlap each other. The net requirement is used so that no output range on a generator can have multiple penalty prices applied for not delivering multiple products. The total unavailable RA megawatts cannot be greater than the maximum megawatt obligation across RA products. This also treats all RA products obligations as a single RA product obligation.
- f:* Calculate the monthly RA availability using daily percent available and net RA requirements.
- g:* RAAIM penalty charges for amount of RA not delivered below the penalty threshold.
- h:* RAAIM incentive payments for amount of RA delivered above the incentive threshold.

**General RAAIM penalty and incentive payment formulation:**

$$a: MW_{d,p}^{avail} = \frac{1}{D_p} * \sum_h MW_{h,d,p}^{avail} / H_p$$

$$b: MW_d^{avail} = \sum_p MW_{d,p}^{avail}$$

$$c: MW_d^{GrossReq} = \sum_p \sum_h \frac{1}{D_p} * (MW_{h,d,p}^{oblig} / H_p)$$

$$d: PctAvail_d = MW_d^{avail} / MW_d^{GrossReq}$$

$$e: MW_d^{NetReq} = \max \left( \sum_p \frac{1}{D_p} * (MW_{h,d,p}^{oblig} / H_p) \right)$$

$$f: PctAvail_m = \sum_{d \in m} PctAvail_d * MW_d^{NetReq} / \sum_{d \in m} MW_d^{NetReq}$$

$$g: RAAIM\_Charge_m = \max(0, T^{penalty} - PctAvail_m) * RAAIM^{penalty} * 1,000 * \sum_{d \in m} MW_d^{NetReq}$$

$$h: RAAIM\_Incentive_m = \max(0, PctAvail_m - T^{incentive}) * RAAIM^{incentive} * 1,000 * \sum_{d \in m} MW_d^{NetReq}$$

**Notation:**

$h$	Indexes hours
$d$	Indexes days
$p$	Indexes RA products
$m$	Indexes months
$D$	Total potential RA product days in month
$H$	Total hours per day of RA product
$MW^{oblig}$	Megawatts of RA obligations
$MW^{avail}$	Megawatts available to meet RA obligation
$PctAvail$	Percent of RA available
$MW^{GrossReq}$	Additive RA obligations across products
$MW^{NetReq}$	Net RA obligation assuming overlap of products
$T^{penalty}$	Threshold availability percentage for penalty charges
$T^{incentive}$	Threshold availability percentage for incentive payments
$RAAIM^{penalty}$	RAAIM penalty rate \$/kW-month
$RAAIM^{incentive}$	RAAIM incentive rate \$/kW-month
$RAAIM\_Charge$	Monthly RAAIM penalty charges
$RAAIM\_Incentive$	Monthly RAAIM incentive payments

### Example: Treatment of multiple RA products under ISO proposal and alternative calculation

Consider a 100 MW generator with a 100 MW system RA obligation and 50 MW flexible RA obligation. The generator self-schedules its entire 100 MW. Table 1 and Table 2 below show the ISO proposed calculation and the alternative calculation of unavailable RA subject to RAAIM charges.

Under the ISO's proposed method, the flexible RA obligation would be subtracted from the system RA obligation to get a new system RA obligation of 50 MW. The flexible RA obligation remains 50 MW. This subtraction treats the RA obligations as overlapping so that the generator cannot have RAAIM charges for multiple RA products on the same output range of a generator. For the 50 MW of overlapping capacity the ISO would penalize the generator as if it had provided neither system nor flexible RA when in fact it had provided system RA. The generator would be subject to RAAIM charges on 50 MW of unavailable flexible RA. The ISO proposed method would only give the generator credit for 50 MW of available system RA even though the generator had 100 MW available.

Under the alternative method the ISO would calculate the percent of total RA obligations (system RA plus flexible RA) that were available. The generator's total RA obligations would be 150 MW (100 system plus 50 flexible). Of the total RA obligations, the generator made available 100 MW (100 system plus 0 flexible). The generator made available 66.7% of its total RA obligations. This means that 33.3% of the RA obligations were unavailable. Of the total net RA requirement of 100 MW, 33.3 MW would be deemed unavailable and subject to RAAIM charges. The alternative method would give the generator credit for 100 MW of system RA, weighted by the net RA requirement, not just 50 MW. The alternative method would also be consistent with the single price paradigm and overlapping treatment of RA obligations of the general RAAIM policy.

**Table 1. RAAIM charge under ISO proposed calculation**

	Avail	Oblig	Pct Avail	Unavail
<b>System</b>	50	100-50=50	100%	0
<b>Flexible</b>	0	50	0%	50
<b>Total</b>	50	100	50.0%	50

**Table 2. RAAIM charge under alternative calculation**

	Avail	Oblig	Pct Avail	Net Req	Unavail
<b>System</b>	100	100	100%		
<b>Flexible</b>	0	50	0%		
<b>Total</b>	100	150	66.7%	100	33.3