Name	Company	Submittal Date
Nuo Tang	San Diego Gas & Electric	8/15/2017

SDG&E appreciates the opportunity to comment on the RAAIM Update White Paper and call held on September 7, 2017.

SDG&E believes the existing Tariff is consistent with the policy proposed in RSI Phase 1A. It is unfortunately the flawed implementation of the existing Tariff that created the issue. SDG&E provides reasons below why changes to the formula are unnecessary. Rather, the CAISO must change its implementation of the existing formula to be consistent with the existing Tariff.

SDG&E believes the existing Tariff requires the CAISO to utilize the worst availability percentage for either of the Flexible or Generic attribute as part of the RAAIM calculation. This ensures that a resource cannot try to mitigate some or all of its RAAIM penalties by providing services of one attribute while ignoring that of the other attribute. This is important as the CAISO did not want to let resources ignore the Flexible MOO after showing it on the supply plan because it can offset those penalties with incentives gained by providing the Generic attribute.

For example, a resource committed 100 MW Generic capacity and 3 MW Cat 1 Flexible Capacity on its Supply plan. It self-schedules 100 MW of generic capacity for the entire month and provided 0 MW economic bid. This would mean the resource would receive 100% generic availability and 0% flex availability. In the current case, the resource would receive 0% monthly availability for the month because the resource did not provide its obligated flexible MOO. To calculate the RAAIM penalty, the CAISO would multiple the 0% monthly availability by the greater of the committed generic or flexible capacity. In this case, it is 100 MW. Therefore, the total penalty for the existing Tariff would be \$357,777.70 for missing the most stringent MOO.

In the CAISO white paper, the CAISO proposes to count the bundled products separately and result in 100% generic availability and 0% flexible availability.

The CAISO's white paper proposes to assess each product "separately". This results in a generic incentive range of \$5,508.63 to \$16,525.89 depending on the capping of the incentive rate up to 300%. Due to the failure of providing Flex capacity, the penalty for the resource would be (\$10,733.31). This results in a total net penalty of (\$5,224.68) to an incentive of \$5,792.58. The CAISO did not intend to let resources offset their RAAIM exposure in this manner. The only method to reduce RAAIM exposure was to provide substitute capacity from other resources.

During the call, SCE advocated for complete unbundling of the capacity products for RAAIM purposes. In such a case, the generic incentive ranges between \$5,679 to \$17,037 and the Flexible penalty would be (\$10,733.31). Again, this creates an incentive for resources to ignore the flexible MOO because a resource could earn a net incentive for providing only the generic capacity. SDG&E does not believe the incentive to provide Flexible capacity should be reduced in this manner.

SDG&E does not believe the CAISO intentionally created additional gaps under RAAIM policy and thus it was only a flawed implementation of an existing formula to accommodate for the new flexible capacity attributes. SDG&E believes that the CAISO should apply the corrected formula retroactively for all settlement statements to the beginning of RAAIM.

In the white paper, the CAISO proposes to make three different modifications to the current calculation.

- 1. Calculate availability for generic and flexible RA products separately
- 2. Calculate availability as a MW value each day, and for each product, instead of MW by hour
- 3. Scale RAAIM penalty and incentive based on the number of days the resource was shown for generic and flexible RA separately, relative to how many days it could have been shown

SDG&E will focus on the second and third modifications as it has already commented on the first modification above.

SDG&E does not believe a change to the availability calculation from hourly to daily is necessary as the results are the same.

For example, a 100 MW resource is shown as 100 MW generic and 30 MW cat 1 flexible capacity. Per the CAISO's proposal, the new formula will treat the resource as having overlapping capacity and therefore would result in 70 MW generic and 30 MW flexible capacity for a month. In the event that the resource did not perform due to forced outage, the penalties would be \$250,443.90 generic RAAIM and \$107,333.10 flexible RAAIM.

		Non-Availabiltiy	Incentive			Non-Availabiltiy	Incentive
Generic Availability Assessment	Standard (%)	Charge (\$)	Payment (\$)	Flex Availability Assessment	Standard (%)	Charge (\$)	Payment (\$)
Low	94.5%			Low	94.59	6	
Mid	96.5%	\$ 250,443.90	\$ -	Mid	96.59	\$ 107,333.10	\$ -
High	98.5%		<u> </u>	High	98.59	6	
							$\nabla$
Generic Monthly MW Short	66.15			Flex Monthly MW Short	28.3	5	$\sum \overline{Possible}$
Non Availability Rate	3.786			Non Availability Rate	3.78	5	d I ossible
RAAIM Non Availability Charge	\$ 250,443.90			RAAIM Non Availability Charge	\$ 107,333.10		
Generic Monthly MW Incentive	0			Flex Monthly MW Incentive		1	Possible
Incentive Rate	11 250	* Assumes max in		Incentive Rate	44.25	8 * Assumes max in	
	11.358	- Assumes max in	icentive rate		11.33	s - Assumes max ii	icentive rate
RAAIM Incentive Payment	\$ -			RAAIM Incentive Payment	\$ -		

When the same scenario is run through the existing formula for the products separately, the results are the same.

RA Obligat	tion Br	eak D	own																											
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon
RA Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Generic	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Flex 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	M	lonth	ly RA	AIM:	Settle	emen	t																
									Cha	arge		Α	wailab	ility	Inc	centiv	/e						
	L								Thr	esho	ld	S	tandaı	rd	Th	resho	old						
	Pe	ercen	tage							94.5	5%		9	6.509	%	98.	50%						
	M	lonth	ly RA	Ince	ntive					70.	00					70	.00						
	In	centi	ve Cr	riteria	3					66.	15					68	.95						
	М	lonth	ly RA	Avai	labilit	ty				0.0	00					0.	00						
	N	on-A	vailal	oility	Char	ge Qt	у			66.	15							$\neg$					
	A۱	vailak	ility	Paym	ent (	Qty										0.	00						
	N	on-A	vailal	oility	Char	ge \$			\$	250,4	143.9	0											
	Α۱	vailak	ility	Paym	ent \$	5									\$		-						
	N	on A	/ailab	oility I	Price	\$/kW	V-mo		\$		3.7	9											
	RA	AAIM	Price	e \$/k\	W-m	0										0.	00						
_																							
r	i	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sa

RA Obligat	ion Br	eak D	own																											
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon
RA Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Generic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex 1	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Flex 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Monthly RAAIM Settlement			
	Charge	Availability	Incentive
	Threshold	Standard	Threshold
Percentage	94.5%	96.50%	98.50%
Monthly RA Incentive	30.00		30.00
Incentive Criteria	28.35		29.55
Monthly RA Availability	0.00		0.00
Non-Availability Charge Qty	28.35		
Availability Payment Qty			0.00
Non-Availability Charge \$ Availability Payment \$	\$ 107,333.10		\$ -
Non Availability Price \$/kW-mo	\$ 3.79		
RAAIM Price \$/kW-mo			0.00

This raises the question whether the change to daily is necessary since the hourly calculation already accounts for the total obligation and performance for each day.

Similarly, modification three proposes to scale the penalties and incentives. Assuming the resource's flexible capacity was only shown for seven days of the month rather than the full month and the unit provided 0 MWs of generic and flexible, the penalty results are the same when comparing new formula versus the old formula.

	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon
RA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Generic	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Flex Category 1	30	30	30	30	30	30	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex Category 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex Category 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

		Non-Availabiltiy	Incentive			Non-Availabiltiy	Incentive
Generic Availability Assessment	Standard (%)	Charge (\$)	Payment (\$)	Flex Availability Assessment	Standard (%)	Charge (\$)	Payment (\$)
Low	94.5%			Low	94.5%		
Mid	96.5%	\$ 332,221.50	\$ -	Mid	96.5%	\$ 25,044.39	\$ -
High	98.5%			High	98.5%		
Generic Monthly MW Short	87.75			Flex Monthly MW Short	6.615		Σ
Non Availability Rate	3.786			Non Availability Rate	3.786		∠ Possible
RAAIM Non Availability Charge	\$ 332,221.50			RAAIM Non Availability Charge	\$ 25,044.39		~
Generic Monthly MW Incentive	0			Flex Monthly MW Incentive	0		$\sum_{d} \overline{Possibl}$
Incentive Rate	11.358	* Assumes max in	centive rate	Incentive Rate	11.358	* Assumes max in	centive rate
RAAIM Incentive Payment	\$ -			RAAIM Incentive Payment	\$ -		

## The generic penalty is \$332,221.50 and flexible penalty is \$25,044.39.

RA Obligat	ion Br	eak D	own																											
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon
RA Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Generic	70	70	70	70	70	70	70	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Flex 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Monthly RAAIM Settlement			
	Charge	Availability	Incentive
	Threshold	Standard	Threshold
Percentage	94.5%	96.50%	98.50%
Monthly RA Incentive	92.86		92.86
Incentive Criteria	87.75		91.46
Monthly RA Availability	0.00		0.00
Non-Availability Charge Qty	87.75		
Availability Payment Qty			0.00
Non-Availability Charge \$	\$ 332,221.50		
Availability Payment \$			\$ -
Non Availability Price \$/kW-mo	\$ 3.79		
RAAIM Price \$/kW-mo			0.00

RA Obligat	ion Br	eak D	own																											
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon
RA Type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Generic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex 1	30	30	30	30	30	30	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flex 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Monthly RAAIM Settlement			
	Charge	Availability	Incentive
	Threshold	Standard	Threshold
Percentage	94.5%	96.50%	98.50%
Monthly RA Incentive	7.00		7.00
Incentive Criteria	6.62		6.90
Monthly RA Availability	0.00		0.00
Non-Availability Charge Qty	6.62		
Availability Payment Qty	0.02		0.00
Non-Availability Charge \$	\$ 25,044.39		
Availability Payment \$			\$ -
Non Availability Price \$/kW-mo	\$ 3.79		
RAAIM Price \$/kW-mo			0.00

The fundamental formula or math behind the existing calculation compared to the new formula is the same. Therefore, it is unnecessary to change the math formula if the CAISO splits the capacity types. This provides the support that the existing formula is consistent with the Tariff and policy and it's the implementation of the formula that's inaccurate.

Given these results, it appears that the CAISO is proposing only one modification and that is the separation of the capacity products for the calculation. SDG&E does not recommend the split for calculating the RAAIM penalty for the reasons previously stated. Instead, SDG&E recommends the CAISO to correct the formula to reflect the existing policy and Tariff and to utilize the worst availability and the maximum capacity attribute for the month. Specifically, calculate the generic availability for the month and the flexible availability for the month and take the lower availability percentage of each type as the single availability result for the month.

SDG&E requests the CAISO to include an example of a more typical RA showing as a calculation. This would allow stakeholders to understand the proposal more clearly. Using a three day month created much confusion especially when stakeholders are used to dealing with 30 day months. Once a base scenario has been established, the CAISO may then increase the complexity to layer events such as substitution or replacement.

On the topic of substitution, SDG&E does not believe the CAISO has explained how its formula treats substitution capacity. For example, if a resource was not shown as RA for the month, but was later used for real time substitution and was unable to perform. This new obligation does not seem to show up in the Excel file even after the data was manually modified. SDG&E recommends the CAISO to provide additional details for forced outage substitutions.

In the following example, the resource was not shown as RA. It substituted for another resource starting on HE 18 on the second day of the month to HE 24 of the fourth day of the month. It provided its availability for the second day but missed its performance on the third and fourth days. While the spreadsheet shows 12.73% availability, the penalty results in \$0 because the spreadsheet does not account for real time substitutions.

	Sun	Mon	Tue	Wed	Thu	Fri	A Sytem Only obligation after	В	C	D	E	-1	A	В	С	D	E	F
RA	1	2	3	4	5	6	Sytem Only obligation after Flex obligation removed (by							Sun	Mon	Tue	Wed	Thu
			-		-	-	MW by Hour)	1	2	3	4		Daily Calculations	1	2	3	4	5
Generic	0	0	0	0	0	0	1	0	0	20	20		Generic Performance (MW by hour)	0	140	0	0	0
Flex Category 1	0	0	0	0	0	0	2	0	0	20 20	20		Generic Obligation (MW by hour)	0	140	480	480	0
Flex Category 2	0	0	0	0	0	0	4	0	0	20	20		Generic Performance %	0	100.0%	0	0	0
Flex Category 3	0	0	0	0	0	0	5	0	0	20	20		Generic Daily MW Obligation	0	20	20	20	0
							6	0	0	20 20	20 20		Generic Daily MW Availability	0	20	0	0	0
	Sun	Mon	Tue	Wed	Thu	Fri	8	0	0	20	20							
Self Schedule	1	2	3	4	5	6	9	0	0	20	20		Flex Performance (MW by hr)	0	0	0	0	0
1	0	0	0	0	0	0	10 11	0	0	20 20	20 20	)	Flex Obligation (MW by hr)	0	0	0	0	0
	0	0	0	0	0	0	12	0	0	20	20	ı	Flexible Performance %	0	0	0	0	0
2	_	_	_	_	_	_	13	0	0	20	20	2	Flex Daily MW Obligation	0	0	0	0	0
3	0	0	0	0	0	0	14	0	0	20	20	3	Flex Daily MW Availability	0	0	0	0	0
4	0	0	0	0	0	0	15 16	0	0	20	20	1						
5	0	0	0	0	0	0	17	0	0	20	20	5	Generic Obligation (non-overlap by hr)	0	140	480	480	0
6	0	0	0	0	0	0	18	0	20	20	20	5	Generic Daily MW Obligation (non-overlap)	0	28	96	96	0
7	0	0	0	0	0	0	19	0	20	20 20	20	7	Weighting Factor	0	1.4	4.8	4.8	0
8	0	0	0	0	0	0	21	0	20	20	20	3						
9	0	0	0	0	0	0	22 23	0	20 20	20 20	20 20	-)	Daily Calculations - Apply Weighting Factor					
10	0	0	0	0	0	0	24	0	20	20	20		Assess Generic Daily MW Availablity	0	28	0	0	0
11	0	0	0	0	0	0						L	Assess Generic Daily MW Obligation	0	28	96	96	0
	_	0		_	_	0	Sytsem Only MOOs (by MW by Hour)	1	2	3	4	2						
12	0	_	0	0	0	-	by Houry 1	0	0	20	20		Assess Flex Daily MW Availability	0	0	0	0	0
13	0	0	0	0	0	0	2	0	0	20	20	1	Assess Flex Daily MW Obligation	0	0	0	0	0
14	0	0	0	0	0	0	3	0	0	20 20	20	,						
15	0	0	0	0	0	0	5	0	0	20	20	5	End of Month Calculations					
16	0	0	0	0	0	0	6	0	0	20	20		Monthly % Available	12.73%				
17	0	0	0	0	0	0	7 9	0	0	20 20	20 20		Generic Possible Assessment Days	0	0	0	0	0
18	0	20	0	0	0	0	9	0	0	20	20		Daily MW Obligation / Possible Assess Days	0	0	0	0	0
19	0	20	0	0	0	0	10	0	0	20	20		Generic Monthly MW Short	0				
20	0	20	0	0	0	0	11 12	0	0	20 20	20 20	L	Generic Monthly MW Incentive	0				
21	0	20	0	0	0	0	13	0	0	20	20	- 2	** *** *** ***	0.00000				
22	0	20	0	0	0	0	14 15	0	0	20 20	20		Monthly % Available Flex Possible Assessment Days	0.00000	0	0	0	0
	_		-	_	_	_	15	0	0	20	20			_	0	0		0
23	0	20	0	0	0	0	17	0	0	20	20		Daily MW Obligation / Possible Assess Days Flex Monthly MW Short	0	0	0	0	0
24	0	20	0	0	0	0	18	0	20	20	20			0				
							19	0	20 20	20 20	20 20	-(	Flex Monthly MW Incentive	0				
	Cum	Man	Tue	Mod	Thu	Cei	20	U	20	20	20	- 5						

		Non-Availabiltiy	Incentive			Non-Availabiltiy	Incentive
Generic Availability Assessment	Standard (%)	Charge (\$)	Payment (\$)	Flex Availability Assessment	Standard (%)	Charge (\$)	Payment (\$)
Low	94.5%			Low	94.5%		
Mid	96.5%	\$ -	\$ -	Mid	96.5%	\$ -	\$ -
High	98.5%			High	98.5%		
Generic Monthly MW Short	0			Flex Monthly MW Short	0		$\sum {Possible\ M}$
Non Availability Rate	3.786			Non Availability Rate	3.786		d Fossible M
RAAIM Non Availability Charge	\$ -			RAAIM Non Availability Charge	\$ -		~
Generic Monthly MW Incentive	0			Flex Monthly MW Incentive	0		$\frac{\sum_{d} \overline{Possible M}}{Possible M}$
Incentive Rate	11.358	* Assumes max in	ncentive rate	Incentive Rate	11.358	* Assumes max in	ncentive rate
RAAIM Incentive Payment	\$ -			RAAIM Incentive Payment	\$ -		

SDG&E also requests the CAISO to provide analysis for its proposal using historical data from April through August to be included in the draft final proposal. This would allow market participants to understand the full impact of the CAISO proposal. This information should be made available as it is difficult to measure the changes without a reference point.

Finally, SDG&E requests the CAISO to detail what type of information it expects to provide to market participants during market simulation and after go-live to allow market participants to accurately validate the CAISO's settlement statements. Without knowing the inputs used by the CAISO, market participants would have an extremely difficult time understanding where the problem exists.

SDG&E believes an additional workshop would help facilitate the discussion of the CAISO's proposal further.