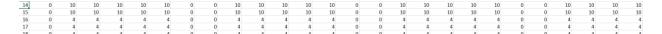| Submitted By	Company Name	Date Submitted
Nuo Tang	San Diego Gas & Electric	10/3/2017

SDG&E appreciates the opportunity to provide additional comments on the RAAIM Calculation Modifications Draft Final Proposal. SDG&E appreciates the additional clarifications to the proposal for hourly real-time substitutions.

SDG&E understands the CAISO's three modifications for the RAAIM calculation. However, SDG&E believes the weighting factor is unintentionally decreasing both the incentives and penalties when generic capacity partially overlaps with Flexible category 2 and 3 capacity.

For example, a resource is shown as 10 MW generic and 6 MW flex category 2 for a month.

	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	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Flex Category 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 Category 2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
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

The generic MOO by hour results in 10 MW for HE 14 and HE 15 and 4 MW for HE 16 through HE 18.

14	0	10	10	10	10	10	0	0	10	10	10	10	10	0	0	10	10	10	10	10	0	0	10	10	10	10	0	0	10	10	10	10
15	0	10	10	10	10	10	0	0	10	10	10	10	10	0	0	10	10	10	10	10	0	0	10	10	10	10	0	0	10	10	10	10
16	0	4	4	4	4	4	0	0	4	4	4	4	4	0	0	4	4	4	4	4	0	0	4	4	4	4	0	0	4	4	4	4
17	0	4	4	4	4	4	0	0	4	4	4	4	4	0	0	4	4	4	4	4	0	0	4	4	4	4	0	0	4	4	4	4
18	0	4	4	4	4	4	0	0	4	4	4	4	4	0	0	4	4	4	4	4	0	0	4	4	4	4	0	0	4	4	4	4

The flexible MOO by hour is 6 MW for HE 16 through HE 20

16	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
17	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
18	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
19	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
20	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

The calculation for generic MOO adds up all of the generic obligations for each hour resulting in 6.4 MW of averaged generic obligation for the weekdays.

Daily Calculations	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
	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 Performance (MW by hour)	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
Generic Obligation (MW by hour)	0	32	32	32	32	32	0	0	32	32	32	32	32	0	0	32	32	32	32	32	0	0	32	32	32	32	0	0	32	32
Generic Performance %	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
Generic Daily MW Obligation	0	6.4	6.4	6.4	6.4	6.4	0	0	6.4	6.4	6.4	6.4	6.4	0	0	6.4	6.4	6.4	6.4	6.4	0	0	6.4	6.4	6.4	6.4	0	0	6.4	6.4
Generic Daily MW Availability	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

If a resource's generic availability for the month was 0%, the calculation results in $18,465.91 of penalty.

Generic Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)
Low	94.5%	
Mid	96.5%	$ 18,465.91
High	98.5%	
Generic Monthly MW Short	4.877419355	
Non Availability Rate	3.786	
RAAIM Non Availability Charge	$ 18,465.91	

However, the penalty calculation is higher if a resource were to have shown only 6.4 MW of generic RA across the entire month without any flexible capacity.

	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	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Flex Category 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 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

Note that this commitment results in the same aggregate generic moo obligation as the example above.

	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
Daily Calculations	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 Performance (MW by hour)	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
Generic Obligation (MW by hour)	0	32	32	32	32	32	0	0	32	32	32	32	32	0	0	32	32	32	32	32	0	0	32	32	32	32	32	0	0	32
Generic Performance %	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
Generic Daily MW Obligation	0	6.4	6.4	6.4	6.4	6.4	0	0	6.4	6.4	6.4	6.4	6.4	0	0	6.4	6.4	6.4	6.4	6.4	0	0	6.4	6.4	6.4	6.4	6.4	0	0	6.4
Generic Daily MW Availability	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

Yet when the same resource's availability is 0% for the month, the penalty is higher, $22.897.73.

Generic Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	In P
Low	94.5%		
Mid	96.5%	$ 22,897.73	
High	98.5%		
Generic Monthly MW Short	6.048		
Non Availability Rate	3.786		
RAAIM Non Availability Charge	$ 22,897.73		

This difference is caused by the daily weighting mechanism.

Generic Obligation (non-overlap by hr)	0	50	50	50	50	50	0	0	50	50	50	50	50	0	0	50	50	50	50	50	0	0	50	50	50	50	50	0	0	50
Generic Daily MW Obligation (non-overlap)	0	10	10	10	10	10	0	0	10	10	10	10	10	0	0	10	10	10	10	10	0	0	10	10	10	10	10	0	0	10
Weighting Factor	1	0.80645	0.80645	0.80645	0.80645	0.80645	1	1	0.80645	0.80645	0.80645	0.80645	0.80645	1	1	0.80645	0.80645	0.80645	0.80645	0.80645	1	1	0.80645	0.80645	0.80645	0.80645	0.80645	1	1	0.8064

The formula splits the capacity attributes based on the average hourly obligation to calculate the weighting factor. Considering the formula is already separately calculating the daily or hourly obligation and performance for each capacity attribute, the weighting mechanism lowers the actual Generic or Flexible Monthly MW that was committed as RA for the purposes of RAAIM.

The weighting mechanism distorts the incentives and penalties even more when the Flex MOO hours do not overlap with the Generic MOO hours.

Using the same 10 MW generic and 6 MW Flex 2 example and setting the Flex Category 2 hours to HE 6 and HE 10, the weighting factor is lowered from 81% to 63%

Generic Obligation (non-overlap by hr)	0	50	50	50	50	50	0	0	50	50	50	50	50	0	0	50	50	50	50	50	0	0	50	50	50	50	50	0	0	50
Generic Daily MW Obligation (non-overlap)	0	10	10	10	10	10	0	0	10	10	10	10	10	0	0	10	10	10	10	10	0	0	10	10	10	10	10	0	0	10
Weighting Factor	1	0.625	0.625	0.625	0.625	0.625	1	1	0.625	0.625	0.625	0.625	0.625	1	1	0.625	0.625	0.625	0.625	0.625	1	1	0.625	0.625	0.625	0.625	0.625	1	1	0.625

This results in a generic penalty of $22,361 for 0% availability.

Generic Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	In Pa
Low	94.5%		
Mid	96.5%	$ 22,361.06	
High	98.5%		
Generic Monthly MW Short	5.90625		
Non Availability Rate	3.786		
RAAIM Non Availability Charge	$ 22,361.06		

The same resource that provided 10 MW of generic would have had a penalty of $35,777.

Generic Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	In Pa
Low	94.5%		
Mid	96.5%	$ 35,777.70	$
High	98.5%		
Generic Monthly MW Short	9.45		
Non Availability Rate	3.786		
RAAIM Non Availability Charge	$ 35,777.70		

Effectively, the weighting factor allows a resource to lower its penalties and incentives by adding additional MWs of flexible category 2 or 3 RA even after the CAISO splits the attributes in the calculation. This is similar to the problem that's occurring in the existing formula. The problem becomes more complicated as the Flex MOO hours change over time.

The weighting factor will also make validating the CAISO settings extremely difficult as each day's non-overlapping Generic MOO may be different due to day-ahead or real-time substitutions. For example, if a resource substituted for another resource on the 2nd day of the month for HE 16 – 18, this not only changes the Generic daily MW Obligation of the day, it also changes the weighting factor for only that day.

Without the weighting factor, each MW of capacity attribute in each hour will continue to be assessed properly for the entire month. This is due to the fact that each capacity attribute obligation is aggregated per hour after being separated for any over-lapping hours and then divided by the total number of hours possible in the month for that attribute. This MW value is then multiplied by the availability percentage and the RAAIM price.

For example, a resource with 100 MW Generic capacity and 60 MW of Flex 2 capacity with 100% availability will receive a generic incentive of $10,903.68 and flex incentive of $10,222.20 without the weighting assuming the incentive rate is maxed out at 300%.

Generic Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	Incentive Payment ($)		Flex Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	Incentive Payment ($)
Low	94.5%				Low	94.5%		
Mid	96.5%	$ -	$ 10,903.68		Mid	96.5%	$ -	$ 10,222.20
High	98.5%				High	98.5%		
Generic Monthly MW Short	0				Flex Monthly MW Short	0		
Non Availability Rate	3.786				Non Availability Rate	3.786		
RAAIM Non Availability Charge	$ -				RAAIM Non Availability Charge	$ -		
Generic Monthly MW Incentive	0.96				Flex Monthly MW Incentive	0.9		
Incentive Rate	11.358	* Assumes max incentive rate			Incentive Rate	11.358	* Assumes max incentive rate	
RAAIM Incentive Payment	$ 10,903.68				RAAIM Incentive Payment	$ 10,222.20		

With the weighting, the incentive payments are $8,793.29 and $8,837.26 for generic and flexible attributes respectively.

Generic Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	Incentive Payment ($)		Flex Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	Incentive Payment ($)
Low	94.5%				Low	94.5%		
Mid	96.5%	$ -	$ 8,793.29		Mid	96.5%	$ -	$ 8,837.26
High	98.5%				High	98.5%		
Generic Monthly MW Short	0				Flex Monthly MW Short	0		
Non Availability Rate	3.786				Non Availability Rate	3.786		
RAAIM Non Availability Charge	$ -				RAAIM Non Availability Charge	$ -		
Generic Monthly MW Incentive	0.774193548				Flex Monthly MW Incentive	0.778064516		
Incentive Rate	11.358	* Assumes max incentive rate			Incentive Rate	11.358	* Assumes max incentive rate	
RAAIM Incentive Payment	$ 8,793.29				RAAIM Incentive Payment	$ 8,837.26		

A resource that met its obligations should be assessed and incentivized equally just as another resource that provided the same attribute. This means that the resource in the example above should receive the same generic incentive as another resource for providing the same Generic obligation but no flex and receives the same flexible incentive as a resource for providing the same Flexible obligation but no Generic.

Resource providing 64 MW Generic RA, 0 MW Flex and 100% available:

Generic Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	Incentive Payment ($)		Flex Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	Incentive Payment ($)
Low	94.5%				Low	94.5%		
Mid	96.5%	$ -	$ 10,903.68		Mid	96.5%	$ -	$ -
High	98.5%				High	98.5%		
Generic Monthly MW Short	0				Flex Monthly MW Short	0		
Non Availability Rate	3.786				Non Availability Rate	3.786		
RAAIM Non Availability Charge	$ -				RAAIM Non Availability Charge	$ -		
Generic Monthly MW Incentive	0.96				Flex Monthly MW Incentive	0		
Incentive Rate	11.358	* Assumes max incentive rate			Incentive Rate	11.358	* Assumes max incentive rate	
RAAIM Incentive Payment	$ 10,903.68				RAAIM Incentive Payment	$ -		

Resource providing 0 MW Generic, 60 MW Flex Cat 2 and 100% available:

Generic Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	Incentive Payment ($)		Flex Availability Assessment	Standard (%)	Non-Availabiltiy Charge ($)	Incentive Payment ($)
Low	94.5%				Low	94.5%		
Mid	96.5%	$ -	$ -		Mid	96.5%	$ -	$ 10,222.20
High	98.5%				High	98.5%		
Generic Monthly MW Short	0				Flex Monthly MW Short	0		
Non Availability Rate	3.786				Non Availability Rate	3.786		
RAAIM Non Availability Charge	$ -				RAAIM Non Availability Charge	$ -		
Generic Monthly MW Incentive	0				Flex Monthly MW Incentive	0.9		
Incentive Rate	11.358	* Assumes max incentive rate			Incentive Rate	11.358	* Assumes max incentive rate	
RAAIM Incentive Payment	$ -				RAAIM Incentive Payment	$ 10,222.20		

As stated in SDG&E's previous comments, SDG&E believes the existing policy and Tariff requires the CAISO to utilize the worst availability and maximum MW commitment to calculate the RAAIM penalties and incentives. This is because the CAISO did not intend to allow resources to offset poor performance of one attribute with good performance of another attribute.

CAISO's change from a single availability measurement and maximum MW amount to separate availability measurements and MW amounts is a tremendous shift in policy. This change should be discussed more in depth rather than be rushed through with a formula update. The CAISO has not adequately explained why the incentives or penalties of two attributes for 1 MW should be limited to the incentive or penalty 1 MW of a single attribute as provided by another resource for one month rather than the 1 MW of each attribute as measured separately. The proposal separates the assessment for each attribute, but limits the combined incentive or penalty to the maximum amount each attribute would have received if offered by itself.

SDG&E does not support the weighting factor because it is not only redundant once the hourly obligation has been separated; it is also reducing the appropriate amount of penalties and incentives. SDG&E does not believe this is accurate and the CAISO should change the formula to remove the weighting.