Resource Adequacy Availability Incentive Mechanism Calculation Modifications White Paper

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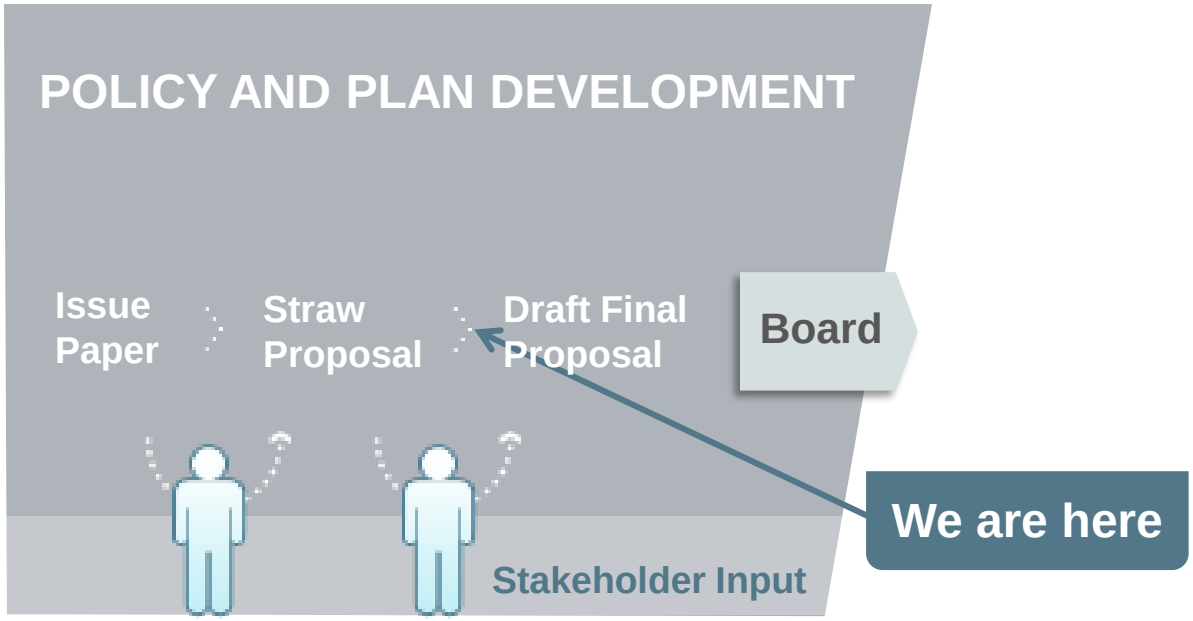
September 7, 2017

Schedule

Date	Milestone
Aug 31	Post White Paper and Spreadsheet
Sep 7	Hold Stakeholder call on White Paper
Sep 14	Stakeholder comments on White Paper due
Sep 21	Post Draft Final Proposal
Sep 28	Hold Stakeholder call on Draft Final Proposal
Sep 28	Stakeholder comments on Draft Final Proposal due
Nov 1-2	Present Proposal to Board of Governors

ISO Policy Initiative Stakeholder Process



The ISO has identified the need for additional prospective modifications to the RAAIM availability calculation

- The objective of RAAIM was to create an incentive to follow applicable must-offer obligations (MOOs) and provide replacement capacity when resources go on outage

- RAAIM calculation implemented based on a spreadsheet produced as part of the RSI1 Policy development
  - http://www.caiso.com/Documents/RAAIMIncentiveCalculationModel.xls

- Current calculation
  - Overweighs flexible capacity
  - Scales MW availability to capture relative availability (i.e., percentage available), but fails to reflect absolute availability (i.e., MWs available)

The ISO proposes to make three modifications to the current RAAIM calculation

1. Calculate availability as a MW value each day, and for each product, instead of MW by hour

2. Calculate availability for system RA and flexible RA separately

3. Scale RAAIM penalty and incentive based on the number of days the resource was shown for system RA and flexible RA separately, relative to how many days it could have been shown

RAAIM calculation should be based on the average compliance with each MOO for the entire day

- Assess availability by calculating the performance of the resource relative to the MOO for the product, divided by the obligation to provide that product for a single day

- Multiply this percentage by the MW value that the resource was supposed to provide to meet its obligations

This calculation yields a daily availability MW value for system or flexible RA

Monthly availability is measured based on daily MW performance

- Availability percent = Sum MW performance over all days ÷ Sum MW obligation over all days

- There will be separate monthly availability percentages calculated for
  - System RA, and
  - Flexible RA capacity

Example 1: Daily calculation of separate products

Two-day month, one weekday and one weekend, **1 MW of system RA capacity on the weekday, and 1 MW of Category 1 flexible RA capacity on the weekend. Resource is fully out on the weekday and fully available on the weekend.**
Step 1: Calculate the average RA obligation for each capacity type each day **1 MW times 5 hours divided by 5 hours for the day of system RA, or 1 MW system RA on the weekday** **1 MW times 17 hours divided by 17 hours for the day flexible RA capacity, or 1 MW flexible on the weekend**
Step 2: Calculate average daily compliance on each capacity type each day **0 MW times 5 hours divided by 5 hours for the day of system RA, or 0 MW system RA availability on the weekday** **1 MW times 17 hours divided by 17 hours for the day flexible RA capacity, or 1 MW flexible RA availability on the weekend**
Step 3: Determine monthly availability for each product **System: 0 MW of total availability divided by 1 MW of obligation equals zero percent available** **Flexible: 1 MW of total availability divided by 1 MW of obligation equals 100 percent available**

Example 2: Daily calculation of separate products

Three days of RA shown for a month, two weekdays and one weekend.

1 MW of system RA capacity shown on both weekdays, and 1 MW of Category 1 flexible RA capacity shown on the weekend. Resource is fully out on the first weekday and fully available on the second weekday and the weekend.

Step 1: Calculate the average RA obligation for each capacity type each day.

1 MW times 5 hours divided by 5 hours for the each day of system RA, or 1 MW system RA on each day, for a total of 2 MWs of system RA on the weekdays.

1 MW times 17 hours divided by 17 hours for flexible RA capacity, or 1 MW flexible RA, on the weekend.

Step 2: Calculate average daily compliance on each day for each product.

0 MW times 5 hours divided by 5 hours for the first weekday of system RA or 0 MW total, 1 MW times 5 hours divided by 5 hours for the second day of system RA or 1 MW total, for a sum total 1 MW system RA availability for both weekdays.

1 MW times 17 hours divided by 17 hours for flexible RA capacity, or 1 MW flexible RA availability, on the weekend.

Step 3: Determine monthly availability percentage for each product.

System: 1 MW of total availability divided by 2 MW of obligation equals 50 percent available.

Flexible: 1 MW of total availability divided by 1 MW of obligation equals 100 percent available.

The ISO will apply a weighting factor when assessment hours do not overlap

- Some the availability assessment hours do not overlap for flexible categories 2 and 3 and system RA
- For example:
  - A resource that shows 2 MW of system RA and one MW of flexible RA category 2
    - Could be subject to the system availability assessment hours for hours 1-5 for two MW and
    - Category 2 flexible RA availability assessment hours for hours 3-8 for one MW
- ISO will apply a weighting factors that accounts for the MW and hours of each product

Example 3: Daily calculation of separate products with Category 2 or 3 Flexible RA

Assumed Availability Assessment Hours

System: Hours 1-5

Flexible Category 2: Hours 3-8

One day month, weekday,

2 MW of system RA capacity and 1 MW of Category 2 flexible RA capacity. Resource is on line, but self-schedules 1 MW the entire day (i.e. not compliant with flexible capacity MOO to bid economically).

Step 1: Calculate the average RA obligation for each capacity type.

2 MW times 2 hours for the system RA not overlapping with flexible RA, plus 1 MW times 3 hours for the system RA beyond the flexible RA. Then divide by 5 hours for 1.4 MW system RA.

1 MW times 5 hours divided by 5 hours for flexible RA capacity, or 1 MW flexible RA capacity.

Divide by the maximum of the system or flexible RA shown for the day (i.e. the maximum amount of RA the resource is providing that day) by the sum MW across all products to develop a scaling factor needed to determine each products daily MW availability requirement: 2/(1.4 + 1) = 2/2.4 = 0.833

This weighting factor can now be used to attribute a MW value to system and flexible RA when the availability assessment hours for system and flexible do not fully overlap.

Example 3: Daily calculation of separate products with Category 2 or 3 Flexible RA (cont.)

Step 2: Apply weighting factor.

Weighting factor: 2 MW/2.4MW = 0.833

System requirement: 1.4 MW x 0.833 = 1.167 MW

Flexible requirement: 1 MW x 0.833 = 0.833

Note: If summed, the obligation would equal 2 MW for the day which equals the maximum amount of RA the resource is providing that day.

Step 3: Calculate average daily compliance for each product.

1 MW times 2 hours where the system RA is not overlapping with flexible RA, plus 1 MW times 3 hours where the system RA is beyond the flexible RA. Then divide by 5 hours for 1 MW system RA availability

Apply weighting factor for system RA availability: 1 MW x 0.833 = 0.833 MW

0 MW times 5 hours divided by 5 hours for flexible RA availability, or 0 MW flexible RA availability.

Apply weighting factor for flexible RA availability: 0 MW x 0.833 = 0 MW

Step 4: Determine monthly availability for each product.

System: 0.833 MW of total availability divided by 1.167 MW of obligation equals 71.43 percent available.

Flexible: 0 MW of total availability divided by 0.833 MW of obligation equals zero percent available.

RA value will be scaled to the number of days a resource provides RA

- The number of days a resource can be shown for each type of RA determines the equivalent daily capacity value of a given product.
  - System RA and flexible RA have a different number of assessment days in a month

System: There are 21 total possible system availability assessment days in a 30 day month.

A resource has 10 MW of system RA capacity for 2 of the assessment days in the month.

System monthly MW obligation = $\frac{10\ MW}{21} + \frac{10\ MW}{21}$ **= 0.95 MW**

Flex: There are 30 total possible Category 1 flex availability assessment days in a 30 day month.

A resource has 10 MW of Category 1 flex RA capacity for 3 days in the month.

Flex monthly MW obligation = $\frac{10\ MW}{30} + \frac{10\ MW}{30} + \frac{10\ MW}{30}$ **= 1 MW**

Example using ISO spreadsheet: Inputs

	Days		
Capacity Type	1-10	11-20	21-30
System	100 MW	100 MW	100 MW
Category 1		75 MW	
Category 2			
Category 3			25 MW

	Days						
	1-4	5	6-10	11-15	16	17-20	21-30
Self-schedule	100 MW	100 MW for hours 1-14 50 MW for hours 15-24	0	25	25 MW for hours 1-14 10 MW for hours 15-24	0	65
Economic bids	0	0	0	75	75 MW for hours 1-14 65 MW for hours 15-24	0	25

Spreadsheet available at:
http://www.caiso.com/Documents/ProposedRAAIMCalculationModificationsModel.xlsx

Next steps

- Stakeholder comments due 9/14
  - Submit all comments to initiativecomments@caiso.com
    - The ISO will not issue a comments template

- Draft final proposal issued by 9/21