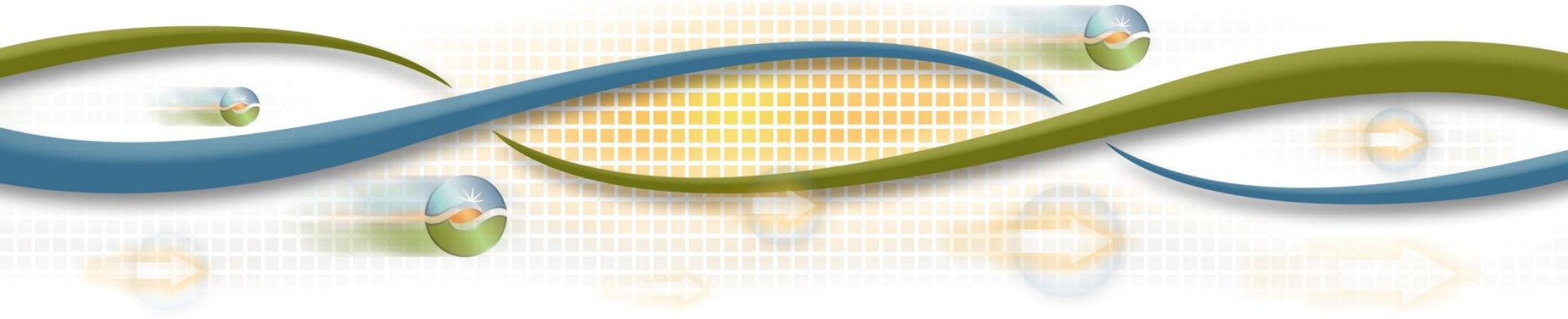


Resource Adequacy Availability Incentive Mechanism (RAAIM) Update

Stakeholder Call
July 26, 2017



RAAIM Update Call

Agenda – July 26, 2017

| Time: | Topic: | Presenter: |
|---------------|---------------------------------|------------------|
| 9:00 – 9:05 | Introductions, Agenda | Kristina Osborne |
| 9:05 – 9:10 | Overview | Joanne Serina |
| 9:10 – 9:30 | Summary of Known Issues | James Lynn |
| 9:30 – 10:00 | Enhancement to RAIM calculation | Karl Meeusen |
| 10:00 – 10:30 | Proposed Timeline to resolution | James Lynn |
| 10:30 – 10:40 | Considerations | Joanne Serina |
| | Q&A | |

Overview

- Since April 1 go live of RAAIM – We have identified several issues with the current settlement
- Initially proposed filing a FERC petition to waive all penalties due to identified issues and the need to refine the current calculation
- Based on Stakeholder feedback and our evaluation of the issues we have reassessed and will not be filing a waiver
- Today we will provide an update on how we will resolve and resettle the known issues
- And present our proposal to improve the calculation prospectively

Summary of Known Issues

The following issues will be resolved and the ISO will resettle RAAIM calculations back to April 1, 2017:

- Open
 - Auto-population of flex RA
 - Failure to exempt certain de-rated non-resource specific system resources
 - Incorrect application of MOOs for NGRs
 - Failure to exempt resources when more than one exemption condition exists
 - Failure to exempt RMR resources
- Resolved
 - Payload issues—RA unit substitution not reflected in settlements
 - RAAIM applied to certain exempt long-start units
 - RAAIM exemption of RDRR from DAM RA obligation

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

- The objective of RAIM was to create an incentive to follow applicable must-offer obligations (MOOs) and provide replacement capacity when resources go on outage
- RAIM calculation implemented based on a spreadsheet produced as part of the RSI1 Policy development
 - <http://www.caiso.com/Documents/RAAIMIncentiveCalculationModel.xls>
- Calculation scales MW availability to capture relative availability (i.e., percentage available), but fails to reflect absolute availability (i.e., MWs available)

Current Example

| Monthly Availability Results | Scenario 1 | | Scenario 2 | |
|---|---|----------------------|---|----------------------|
| System RA shown | 100 MW every day (5 day forced outage) | | 100 MW every day (5 day forced outage) | |
| Flex RA shown | 0 MW | | 1 MW on everyday (not overlapping with outage) | |
| | Total MW hours | Total MWs (month) | Total MW hours | Total MWs (month) |
| Monthly RA Availability | 8,000 | 76.19 | 8,345 | 16.36 |
| Monthly RA Obligation | 10,500 | 100.00 | 10,905 | 21.38 |
| Assessment Hours | 105 | | 510 | |
| Availability Percentage | | 76.19% | | 76.52% |
| Non-Availability Charge MW Amount | | 18.31 | | 3.84 |
| Non-Availability Charge Dollar (\$) Amount | | \$69,393.10 | | \$14,567.16 |

Summary of calculation flaw identified

- Calculation relies heavily on “assessment hours”
 - Entering 1 MW of flex on every day increases the assessment hours from 105 to 510 because it imposes a 17 hour MOO for all days (in red)
- For the same outage, the effective capacity drops from \$3.79/kWm to \$0.79/kWm by adding 1 MW of flexible capacity
- The calculation to determine a daily MW equivalent captures relative availability (percent available), but penalty based on a reduced MW quantity (i.e. Total MW (month) in scenario 1 vs 2 in green)
 - Determines the quantity MWs for which they are charged (18 MW is far more costly than 4 MW)

Current calculation reduces incentives to provide replacement capacity and follow MOOs

- Current calculation potentially allows resources to dramatically reduce the penalty for an outage
 - Places too much weight on flexible RA MOO
 - Allows resource to spread outages over more hours and inappropriately reduce RAIM penalties
- Prompt correction is required
- The ISO is monitoring the results of the calculation until modifications are in place

The current calculation allows the hours of MOOs assessed to increase disproportionately relative to MWs

- 1 hour outage generic only = 0.95% of all hours
- 1 hour outage generic and flex = 0.19% of all hours

- 1 day outage generic only = 4.76% of all hours
- 1 day outage generic and flex = 3.33% of all hours

- Adding Category 1 flexible RA significantly reduces the impact of an outage on the availability calculation

Two approaches are being considered to ensure incentives better align with policy objectives

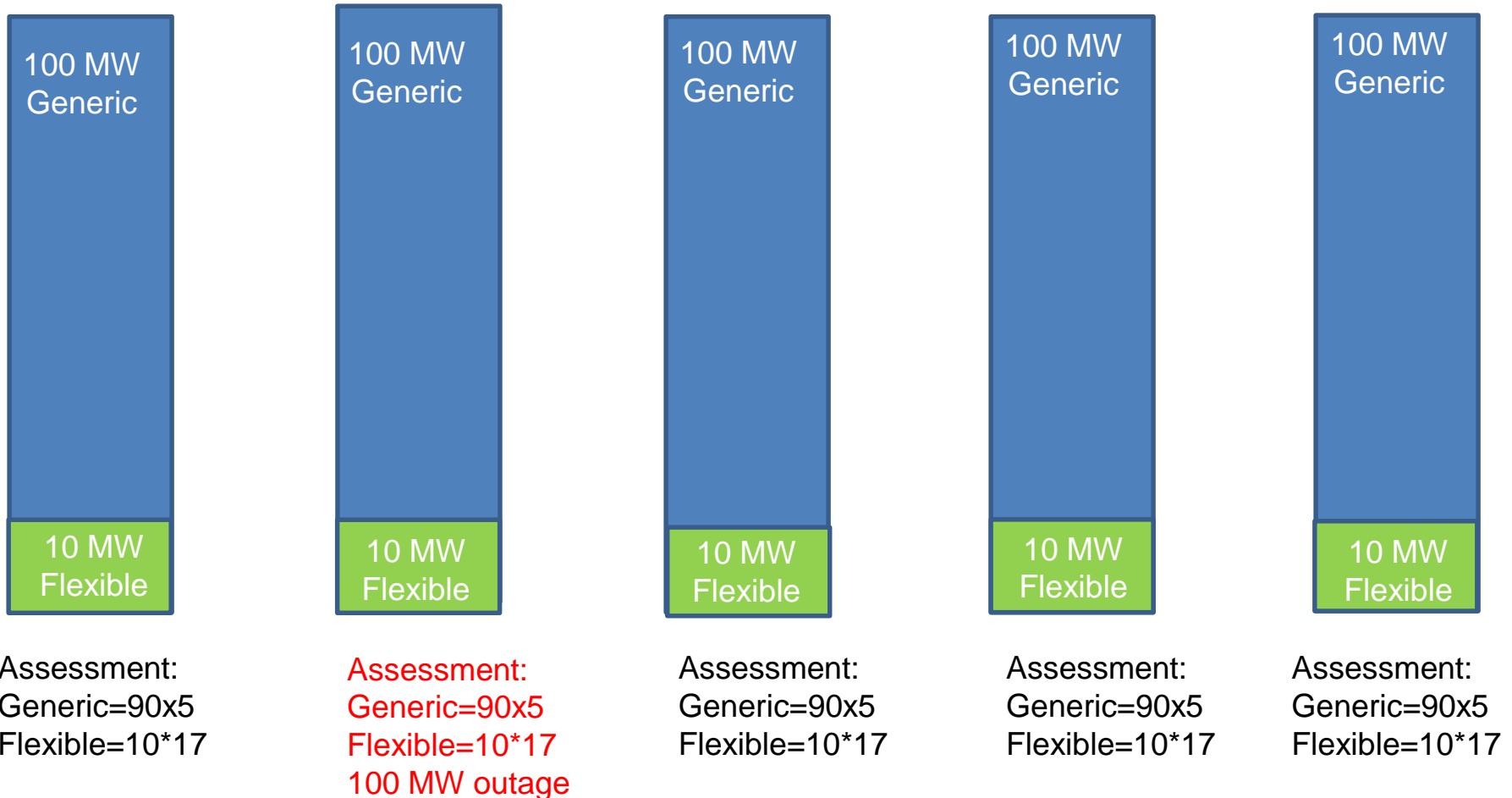
1. System and flexible – combined

- Each MW assessed as generic or flex for each hour
- Compliance measured daily and converted to MW based on percent compliant with a specific MOO
- Compliance with both generic and flexible combined into single availability assessment measurement

2. System and flexible – separated

- Each MW assessed as generic or flex for each hour
- Compliance measured daily for each RA type and converted to MW based on percent compliant with a specific MOO
- Availability calculated separately for system and flexible capacity (i.e. two assessments)
 - May result in charge for one type and penalty for the other

Example: Five days of RA in 30 day month



* Flexible MOO always trumps generic MOO in a given hour

Example (continued): Five days of RA in 30 day month

| | Current Calculation without Flexible | Current Calculation with Flexible | System and flexible combined | System and flexible separated | |
|---------------------------|--------------------------------------|-----------------------------------|------------------------------|-------------------------------|----------|
| | Total | Total | Total | System | Flexible |
| Availability percent | 80% | 80% | 80% | 80% | 80% |
| Non-availability quantity | 14.5 MW | 5.29 MW | 14.5 MW | 13.05 MW | 1.45 MW |
| Non-availability charge | \$54,955 | \$20,042 | \$54,955 | \$49,459 | \$5,495 |
| Total | \$54,955 | \$20,042 | \$54,955 | \$54,955 | |

Proposed Timeline for Resettlement



- Penalties and incentives will continue to be estimated at zero until known issues are corrected.
 - Known issues will be fixed and implemented with the Fall Release – 11/1/2017
 - Penalties and incentives will be calculated back to 4/1/2017
 - Customers will begin to see RAAIM binding calculations starting on 11/3/2017 monthly statement in accordance with settlement calendar

Stakeholder Process to be Initiated for Prospective Calculation Refinement

- The ISO is planning an abbreviated SH process
 - Issue White Paper
 - Following White Paper – Stakeholder call to be scheduled
 - Comment period for customer input
- Timeline and additional details forthcoming

Considerations.....

- Market participants should be mindful of the need to submit bids consistent with the applicable tariff must offer obligations, including the requirement set forth in section 40.10.6.1 to submit Economic Bids for Flexible RA capacity.
- Training Reference Material:
http://www.caiso.com/Documents/ResourceAdequacyPre-MarketSimSettlementsWorkshopJan6_2016.pdf
- If you have any other RAIM settlement issues that are not identified above, please follow the normal dispute process



Q & A