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## ***Durable Flexible RA Proposal***

**2015-08-18**

## Background

- On 7/22/2015, CAISO held a workshop where they presented ideas for durable Flexible RA product:

[http://www.caiso.com/Documents/Agenda\\_Presentation\\_FlexibleResourceAdequacyCriteria\\_MustOfferObligations\\_WorkingGroup.pdf](http://www.caiso.com/Documents/Agenda_Presentation_FlexibleResourceAdequacyCriteria_MustOfferObligations_WorkingGroup.pdf)

- At the end of the workshop, CAISO requested comments on the proposed ideas while also inviting parties to submit their own proposals for discussion
- SCE offers an alternative to the CAISO's proposal that provides a more reasonable starting point for discussions surrounding a durable Flexible RA product
- This proposal defines a durable RA framework while also describing the appropriate venue to address concerns raised by CAISO on 7/22 that do not fit into a RA framework

## Agenda

1. Durable Flexible RA Framework
2. Short Term Ramps
3. Discussion on other CAISO Concerns
  - Long Term Ramps
  - Pmin Burden / Over-Generation
  - Self Scheduling
4. Proposal Summary

# ***Durable Flexible RA Framework***

## The framework modifies the interim solution to create a durable Flexible RA product

### 1) Keep the interim solution product definition

- LSE's procure a single 3 hour product to meet a single flexibility requirement

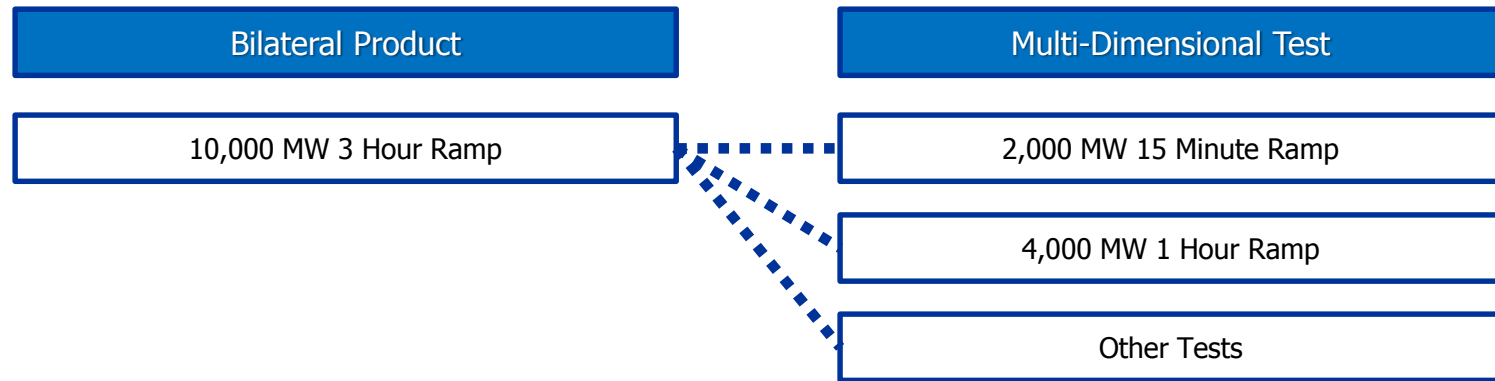
### 2) Perform a Multi-Dimension Test to Ensure Reliability

- Once resources are shown by LSEs, CAISO can validate the shown portfolio using multiple flexibility criteria
- Tests will be predefined and well understood by all parties
- Conceptually similar to the current process for Local RA



Framework results in a product that will meet CAISO's flexibility needs with only minimal changes to the interim product

## Application of the framework results in a simple product that will meet multiple flexibility requirements



### In this example:





1. LSE's will procure and show a single portfolio that meets a *10,000 MW of 3 hour ramp EFC* requirement.
2. CAISO will test the shown portfolio to see if it has the capability to meet 2,000 MW of 15-minute ramp, 4,000 MW of 1 hour ramp, etc.
3. Deficiencies are cured by additional LSE showing/procurement and/or ISO backstop procurement
  1. Details of cure process are TBD, but, conceptually similar to the cure process for Local RA effectiveness deficiencies

# ***How the Proposed Framework Addresses Short Term Ramps***

## SCE designed an analysis to verify the 3 hour product will reliably pass the multi-dimensional test

### Framework Analysis Methodology\*

1. Create generation portfolios that satisfy the 3 hour ramping product
2. Test the generation portfolios against the multi-dimensional requirements  
“Does the flexible RA portfolio meet the largest 15-minute ramp, 1 hour ramp, etc.”
3. Determine how often a portfolio that satisfies the 3 hour ramping requirement will pass the multi-dimensional test:

-  Test will **always pass** regardless of generation portfolio selected
-  Test is **expected to pass**, but could not be with specific portfolios
-  Test is **not expected to pass**, but could be with specific portfolios
-  Test could **never pass** with a portfolio that met the product definition





Assumptions: Generation fleet and System Needs from 2014 LTPP; Product definitions the same as the interim solution; Test requirements developed in a similar manner as the interim solution



# 3 Hour Product in the 2024 Trajectory LTPP Case

## 2024 Net Load and Generation Fleet

Test Metrics	Month of Year											
	1	2	3	4	5	6	7	8	9	10	11	12
5 Minute Ramp	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
15 Minute Ramp	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
30 Minute Ramp	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
1 Hour Ramp	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
2 Hour Ramp	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
3 Hour Ramp (Once a Day)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
3 Hour Ramp (Twice a Day)*	Yellow	Green	Green	Green	Green	Green	Yellow	Yellow	Green	Yellow	Green	Green

-  Test will **always pass** regardless of generation portfolio selected
-  Test is **expected to pass**, but could not be with specific portfolios
-  Test is **not expected to pass**, but could be with specific portfolios
-  Test could **never pass** with a portfolio that met the product definition

\*Maintaining the three separate categories from the interim solution (Base, Peak, Super Peak Ramping) will guarantee the twice a day, 3 hour ramp, test always passes

# ***Discussion on CAISO Concerns***

## Ramps across multiple days will be naturally met without increasing Flexible RA requirements

At the 7/22/2015 workshop, CAISO proposed to set the monthly flexible RA requirement to be equal to the difference between the monthly net load trough and the monthly net load peak<sup>1</sup>

### Net Load Trough and Net Load Peak Separation (2014 LTPP 2024 Trajectory Case)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<u>Days</u> between <u>monthly</u> net load trough and net load peak	5	10	17	4	9	10	18	5	12	4	5	8
Average <u>hours</u> between <u>daily</u> net load trough and net load peak	11	8	7	9	10	10	12	11	9	9	8	9

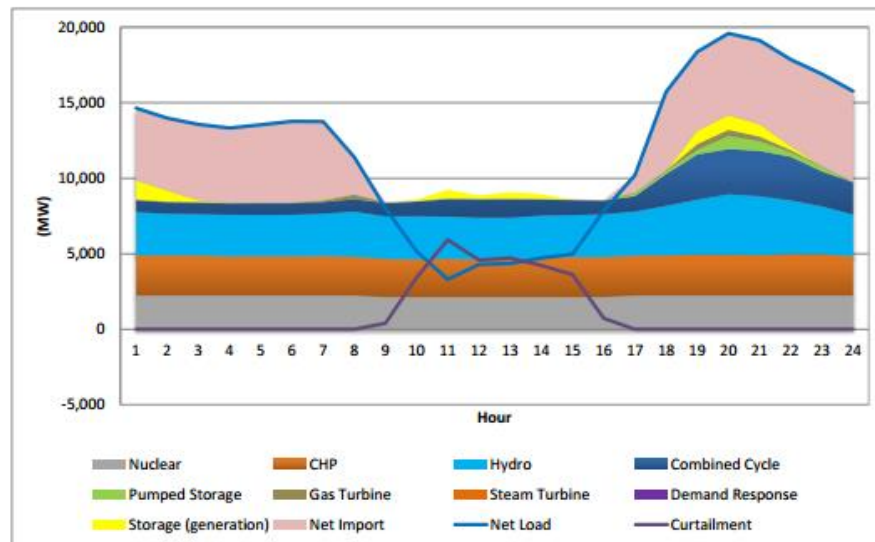
- Within a month, a significant amount of capacity that does not qualify for a three hour ramp product can help meet a net load peak that is multiple days away from a net load trough
- Within a day, a significant amount of capacity that does not qualify for a three hour ramp product can help meet a net load trough to peak ramp that is more than three hours apart
- Setting the flexibility need to be the largest three hour net load ramp<sup>2</sup> aligns the product definition with the procurement requirement

1. With an adder for PRM  
2. With an adder for contingency reserves

## The Pmin burden extends beyond the scope of Resource Adequacy

At the 7/22/2015 workshop, CAISO discussed valid concerns regarding the significant penetration of must take energy during low load days and the resulting over-generation concerns / need for low pmin flexible resources (the Pmin burden):

### Ramping process of March 24, 2024 - Trajectory scenario



- In some cases, over-generation can not be solved even if every flexible resource had a 0 Pmin
- Given the need for long term incentives and solutions, the appropriate venue to address this issue is the Long Term Procurement Plan
- Incentives that do fit within the scope of the RA framework<sup>1</sup> should be explored and addressed but a solution should not be forced within RA

1. For example, the interim solution provides incentives for generators to reduce their pmin and/or start time to qualify for more flexible RA capacity

## Forcing resources to economically bid instead of self schedule will not resolve the over-generation problem or prevent negative prices

At the 7/22/2015 workshop, CAISO proposed to restrict some resources from self scheduling, however, there are multiple reasons generation self schedules that will not be fixed by removing the self-scheduling option:

*Environmental Limitations*

*SIBR Rules*

*Limitations of a 24 Hour Optimization*

*Contract Limitations*

*Possibly Many More*

1. Forcing bids will cause generators to economically bid in a way that best mimics self scheduling since drivers are not captured in CAISO's market
  2. To best mimic self scheduling, generators are likely to bid the price floor
  3. Having a large amount of capacity self scheduling vs bidding the price floor does not significantly help the over-generation problem or reduce the frequency of negative prices
- Furthermore, self scheduling curtailment rules already in place will need to be parlayed into economic bid curtailment rules to account for regulatory policies surrounding resource curtailment prioritization

## The unique Must Offer Obligation for Flexible Capacity is not needed and creates a burden for market participants

The current interim solution does not allow Flexible RA to self schedule which creates unnecessary burdens:

- Multiple must offer obligation measurements and penalties
- Confusion over when different must offer obligations are required on the system when hours don't overlap
- Penalties that do not match the flexible capacity being provided by generators

Since the requirement to economically bid instead of self schedule creates unnecessary burdens while not improving over-generation concerns:

- **The requirement for economical bids should be removed**
- **A single must offer obligation for all types of capacity should be implemented (Current System and Local must offer obligation should be applied to Flexible capacity)**
- **Self Scheduling should be addressed by identifying and resolving the causes of self-scheduling and ensuring automation and proper curtailment order of self schedules**

# *Proposal Summary*

## Summary of Durable Flexible RA Proposal

1. 3 Hour Flexible RA Product  
*Same as Interim Solution*
2. Multi-Dimension Test to Ensure Reliability  
*Conceptually the same as the Local RA process*
3. Single Must Offer Obligation for All Capacity

- Short term ramps are reliably met
- Long term ramps are met by flexible capacity and capacity ineligible for the flexible RA definition
- Self Scheduling should be addressed by fixing the causes of self scheduling
- Complex rules resulting from multiple must offer obligations are no longer needed
- Pmin burden is partially addressed with market incentives while ultimate solutions are addressed through LTPP



## Comparison of Proposed Framework and the CAISO Proposal

	Proposed Framework	7/22 CAISO Presentation
Product Definition	3 Hour Ramp	3 Hour Ramp
Product Requirement	3 Hour Ramp*	Monthly Trough to Monthly Peak Ramp*
Short Term Ramps	Met through testing	Met through testing
Long Duration Ramps	Met with both Flex RA and non Flex RA resources	Uses 3 hour ramp to meet all system ramps, regardless of duration
Self Scheduling	Requires addressing the reasons generators self schedule	Artificially restricts self schedules
Over-Generation / Pmin Burden	Requires comprehensive solution	Uses only RA mechanisms to address issues that extend beyond RA
Changes to Interim Solution	Minimal	Significant

\*Plus associated adder

***Thank You!***

***Please send questions and comments to:***

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