Reliability Demand Response Resource Bidding Enhancements: Revised Straw Proposal

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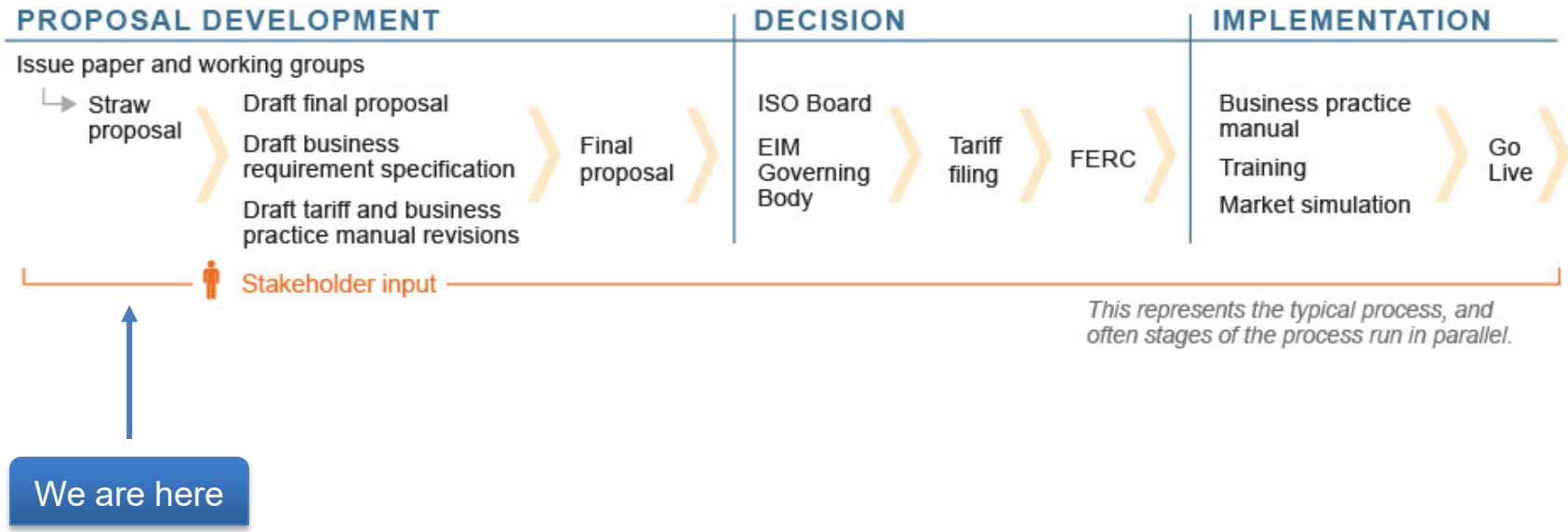
Agenda

Time	Topic	Presenter
10:00-10:10	Welcome and Introduction	Kristina Osborne
10:10-10:20	Background and Scope	Anja Gilbert
10:20-10:40	Aligning Real Time Bidding Rules with FERC Order 831	Danielle Tavel
10:40-11:20	Infeasible Dispatch, Minimum Load Cost, and Discrete RDRR Registration	Anja Gilbert
11:20-11:30	EIM Governing Body Role	Anja Gilbert
11:30-11:50	Additional Q&A	Keoni Almeida
11:50-12:00	Next Steps	Keoni Almeida

CAISO Policy Initiative Stakeholder Process



BACKGROUND AND SCOPE

This initiative explores three issues related to Reliability Demand Response Resource (RDRR) bidding options

I. Aligning real time bidding rules with FERC Order 831
   - In a separate stakeholder engagement effort the CAISO will develop cost justification methodology for DR resources (including RDRRs participating economically in the day-ahead market) and energy storage resources bidding above $1,000/MWh

II. Examining infeasible dispatch issues and minimum load costs

III. Re-examining the cap on discrete RDRR registration

ALIGNING REAL TIME BIDDING RULES WITH FERC ORDER 831

FERC Order No. 831 Background

- 2016 FERC issued Order No. 831 required ISO/RTOs to revise their tariffs to raise energy bid cap from $1,000/MWh to $2,000/MWh
  - Required ISO/RTOs verify generator costs for bids above $1,000/MWh before the market run to be eligible to set energy prices

- June 2021 CAISO FERC Order No. 831 – Import Bidding and Market Parameters Initiative activated
  - Implemented various tariff revisions and system updates to accommodate bidding flexibility above $1,000/MWh

RDRR Bidding rules under the FERC Order No. 831 paradigm

- Currently, RDRR in real time, are required to submit bids at or above 95% of the bid cap ($950/MWh)
  - RDRR can be released for dispatch when a Warning notice is issued in real-time
  - Under FERC Order No. 831, the bid cap is raised from $1,000/MWh to $2,000/MWh only during periods when either:
    - Resource-specific resources have submitted a cost-verified energy bid greater than $1,000/MWh
    - The CAISO-calculated maximum allowable import bid price is greater than $1,000/MWh
- When the bid cap is set to $2,000/MWh RDRR bids are still capped at $1,000/MWh unless they submit a pre-market manual reference level change request based on higher operating or fuel costs

Options for SIBR Implementation

1. Re-run bid validation rules against all submitted RDRR bids when the bid cap is raised to $2000/MWh
   - Bids between $950/MWh-$1000/MWh which were previously validated are rejected

2. Take no action, let previously validated bids be passed to market
   - RDRR bids in the $950- $1000/MWh range will be passed to the market along with bids in the $1900-$2000/MWh range

3. After market close, if there are RDRR bids which are priced outside the $1900-$2000/MWh range, adjust the bids so that they are within the range
   - Alternative options include adjusting all bids up to the $1900/MWh bid floor, or doubling the existing bid

RSP proposal

- Continue to propose:
  1. To maintain the existing bidding structure for RDRR when bid cap is $1,000/MWh
  2. In real time, when bid cap is raised to $2,000/MWh, propose to require RDRR to bid at least 95% of the hard bid cap ($1,900/MWh) without additional cost-justification support

- Add SIBR implementation details to proposal:
  - Propose a nuanced approach to Option 3
    - Adjust all RDRR bids when the bid cap changes by preserving the percentage of the bid cap originally submitted by the SC
      - i.e. If the original bid was 95% of the soft energy bid cap and the bid cap increases to $2000, the market would adjust the bid to be 95% of $2000
      - This proposal will hold true when the bid cap is adjusted downward as well

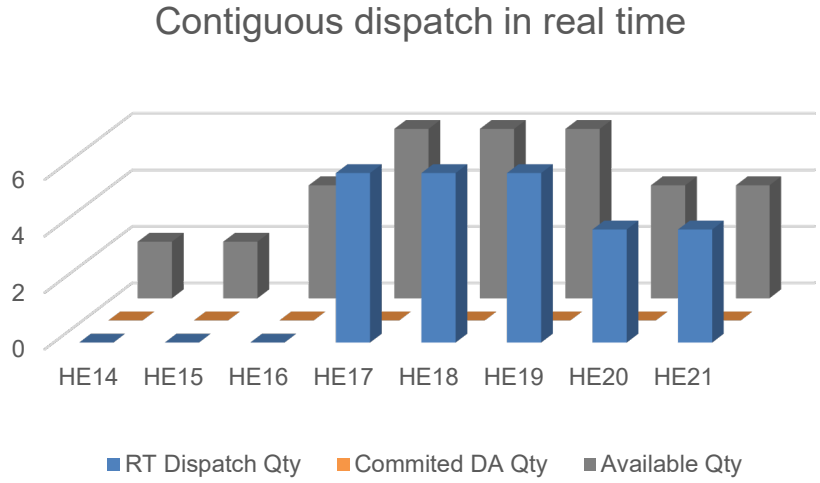
Real-time market RDRR bidding example

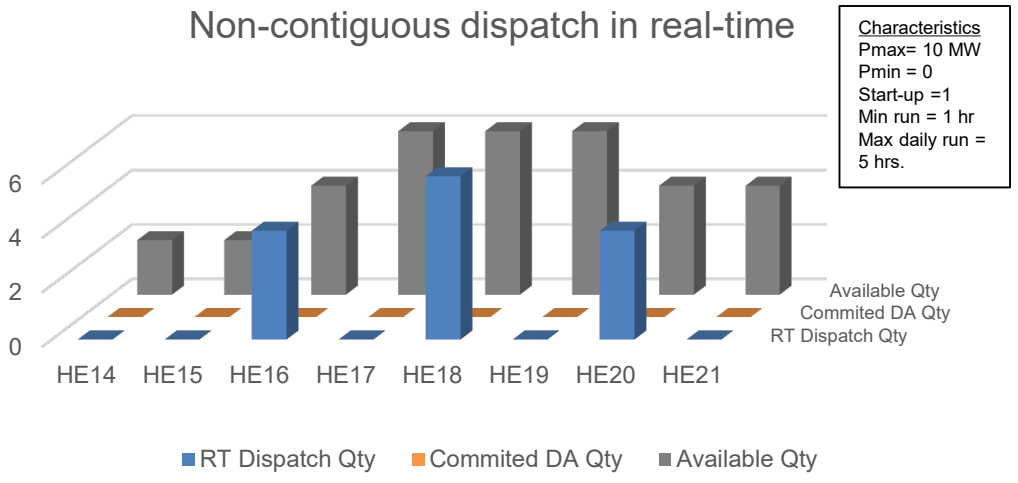
- Assume the conditions to raise the energy bid cap to $2,000/MWh in the day-ahead market have not been met
- In the real-time market for hour-ending 17:
  - A resource-specific resource has submitted a cost-verified energy bid greater than $1,000/MWh at 14:00 for hour-ending 17
    - Triggers the energy bid cap to raise from $1,000/MWh to $2,000/MWh
  - SC has submitted an RDRR bid at 97% of the soft energy bid cap ($970/MWh)
  - SC's have until 14:45 (close of RT hour-ending 17) to re-submit RDRR bids in accordance with the change in bid cap
    - If no action is taken by SC to change RDRR bid to be at least 95% of $2,000/MWh; SIBR will automatically adjust their bid to be 97% of the hard energy bid cap ($1,940/MWh)

RDRR INFEASIBLE DISPATCH & MINIMUM LOAD COSTS

Background: Real Time RDRR Contiguous or Non-Contiguous Dispatch

- In real time RDRRs can be dispatched either contiguously or non-contiguously (also referred to as “infeasible” by market participants)
- In general, a resource with zero Pmin and zero commitment costs will be considered on-line, even at zero, unless it is at zero for the entire period





Minimum Load Cost (MLC)

- CAISO sought to fix the real time infeasible RDRR dispatch issue by first examining if there were MLCs that could reflect RDRRs actual costs to reach minimum load.
- Today, RDRRs are not able to reflect a MLC
  - Currently RDRRs are required to have a $0/MWh MLC
  - With CAISO's Summer Enhancements implemented, RDRR is more likely to be dispatched by the market
  - With a $0/MWh MLC the resource appears "free" and results in an infeasible dispatch
- Stakeholders did not indicate what specific MLC could reflect the cost of reaching minimum load.
- The CAISO recognizes that RDRR in real time is unique in that bids are between 95-100% of the bid cap. This is set in CAISO's tariff to reflect the spirt of the RDRR Settlement Agreement.

RSP Proposal

- The CAISO first examined if RDRR had MLC that reflected the cost of reaching minimum load. Our efforts are now pivoting to focus on fixing the issue of infeasible dispatches.

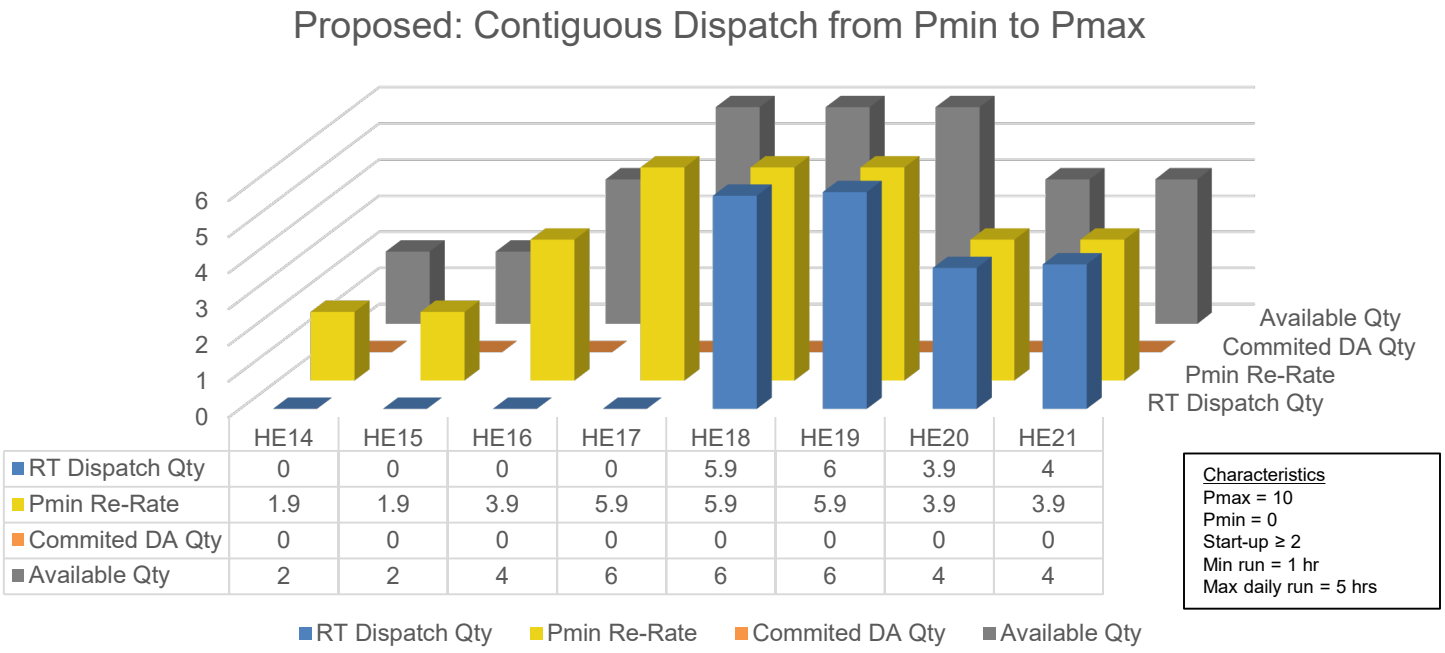
- CAISO is proposing to fix the issue in the optimization for discrete resources without a DA schedule by:
  1. Setting the Pmin to a value just below the upper economic limit, using existing Pmin-rerate functionality
  2. Adding the value (bid price)*(economic limit) to the existing MLC

  This will enable the market to commit discrete RDRR, when RDRR is activated, like a generator with a non-zero Pmin. The market would then publish the Pmin re-rate and MLC for pre-qualification for bid cost recovery.

Example: Enabling contiguous dispatch

Process:

- Re-rate the minimum operating level (Pmin) to below the upper economic limit (bid)
- Set the minimum load cost to ($950/MWh) * (5.9 MW) = $5,605/hour



	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21
RT Dispatch Qty	0	0	0	0	5.9	6	3.9	4
Pmin Re-Rate	1.9	1.9	3.9	5.9	5.9	5.9	3.9	3.9
Commited DA Qty	0	0	0	0	0	0	0	0
Available Qty	2	2	4	6	6	6	4	4

Characteristics
Pmax = 10
Pmin = 0
Start-up ≥ 2
Min run = 1 hr
Max daily run = 5 hrs

In HE 18 when the resource is dispatched to 5.9 MW, their minimum operating limit of 5.9 MW and minimum load cost of $ 5,605/hour will be eligible for Bid Cost Recovery consideration.

RDRR REGISTRATION

RDRR Discrete Cap

Stakeholders have requested CAISO increase/remove the current 50MW cap for discrete RDRR registration

- RDRRs operate together in one sub-LAP but due to the 50 MW cap are forced to be represented separately
- This results in challenges for some Scheduling Coordinators to dispatch their programs

RDRR Discrete Cap: Discrete to Continuous Issues

- Imbalance Issues:
  - Discrete resources are treated as continuous in the pricing run and discrete in the scheduling run
  - The market may need to dispatch a resource at 25MW when in reality the resource can be at 50MW
  - In aggregate, this can create an imbalance that would then need to be absorbed in the CAISO's system through ACE or regulation
- Pricing Issues:
  - When a discrete resource sets prices in the pricing run, it will generally set a higher price than the price that the final, most expensive continuous resource dispatched in the scheduling run would have set
  - These final continuous resources have the incentive to deviate up from the ISO's dispatch

Developing a new cap requires analysis into the current and future resources that would utilize the discrete option

RSP Proposal:

- No change to the cap:
  - The discrete to continuous relationship challenge
  - The ability for IOUs to change their program dispatch though IT enhancements
  - The limited use of this change today (e.g., if increased to 100MW), and unknown impacts in the future

EIM GOVERNING BODY ROLE

EIM Governing Body will have joint authority on RDRR Bidding Enhancements

- This initiative proposes changes to two separate elements of RDRR: 1.) options for bidding RDRR in the real-time market, and 2.) cost representation of RDRR.

- EIM balancing authority areas may use the RDRR model assuming they have approval from their local regulatory authority and meet the requirements of RDRR participation.

- Stakeholders are encouraged to submit a response to the EIM classification of this initiative in their written comments.

NEXT STEPS

Timeline

Date	Milestone
12/22/2021	Stakeholder conference call on revised straw proposal
1/7/2021	Stakeholder comments due on revised straw proposal
1/24/2021	**Publish draft final proposal**
2/1/2021	Stakeholder conference call on draft final proposal
2/11/2021	Stakeholder comments due on draft final proposal
3/2/2021	**Publish final proposal and draft tariff language**
3/9/2021	Stakeholder conference call on final proposal and draft tariff language
3/16/2021	Stakeholder comments due on final proposal and draft tariff language
April 2022	**Present RDRR Bidding Enhancements to EIM Governing Body**
April 2022	**Present RDRR Bidding Enhancements to CAISO Board**

Comments

- Stakeholders are asked to submit written comments by January 7, 2021 through the commenting tool.
- A comment template will be posted on the CAISO's initiative webpage here: https://stakeholdercenter.caiso.com/StakeholderInitiatives/Reliability-demand-response-resource-bidding-enhancements