



August 22, 2022

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Re: California Independent System Operator Corporation
Docket No. ER22-____-000**

**Tariff Amendment to Enhance Reliability Demand Response
Resource Dispatch**

Dear Secretary Bose:

The California Independent System Operator Corporation (“CAISO”) submits this tariff amendment to enhance the dispatch of Reliability Demand Response Resources (“RDRRs”) in the CAISO markets.¹ First, the CAISO proposes to ensure the real-time market respects the maximum number of daily starts for discrete-dispatch RDRRs by developing the functionality to recognize these operational limits.² Second, the CAISO proposes to allow discrete RDRRs to register up to 100 MW in size, or larger if they meet certain criteria. Both enhancements improve the dispatch and reliability of RDRR by better reflecting their operational capabilities in the market.

RDRRs are demand response resources that curtail load if a transmission or system emergency occurs.³ RDRRs generally consist of utility programs for interruptible industrial, air-conditioning, and agricultural pumping loads. The

¹ The CAISO submits this filing pursuant to section 205 of the Federal Power Act (“FPA”), 16 U.S.C. § 824d, and Part 35 of the Commission’s Regulations, 18 C.F.R. Part 35. Capitalized terms not otherwise defined herein have the meanings set forth in Appendix A to the CAISO tariff, and references herein to specific tariff sections are references to sections of the CAISO tariff unless otherwise specified.

² RDRRs may have physical limitations or restrictions through the utility program, such as a firm service level agreement.

³ The CAISO only enables RDRRs for dispatch through market optimization when the reliability coordinator has declared an emergency where the CAISO has exhausted, or imminently will exhaust, economic resources, including imports.

CAISO tariff provides utilities the option to restrict CAISO RDRR dispatches to their full load reduction.⁴ This is known as the “discrete-dispatch” option.

As discrete-dispatch RDRRs operate as “all or nothing resources”, any economic dispatch of an RDRR resource to its minimum value (zero) appears to the utility and program participants as a shut down. This is problematic as RDRR resources typically have one start per day. Any dispatch to a resource’s minimum value and then back to its maximum value is viewed as an “infeasible dispatch” instruction.⁵ The CAISO’s model does not currently recognize one start per day dispatch limitations in the RDRR context. As a result, the CAISO has manually dispatched RDRRs in emergency conditions, rather than through the market. The CAISO’s first proposed tariff amendment addresses this issue.

Additionally, the CAISO tariff limits RDRRs using the discrete dispatch option to 50 MW or less.⁶ The objective of this limit is to ensure that when RDRRs’ loads return at the end of a dispatch, they do not cause or exacerbate reliability issues. However, many RDRRs using the discrete option are, in fact, larger than 50 MW, requiring them to split the load into multiple resource IDs for the same facility.⁷ Based on the CAISO’s experience with RDRRs, the CAISO believes it can accommodate larger RDRRs to use the discrete dispatch option without creating reliability risks. The CAISO proposes to allow RDRRs up to 100 MW to use the discrete dispatch option; larger RDRRs may use it subject to a reliability review by the CAISO.⁸ This will allow more RDRRs to participate in the CAISO markets, and it will ensure the CAISO has modeled each RDRR accurately.

The CAISO respectfully requests the Commission issue an order by October 22, 2022, accepting the proposed tariff revisions to be effective on or

⁴ Section 30.6.2.1.2 of the CAISO tariff. Unlike conventional demand response resources, RDRRs often are not capable of granular dispatch due to physical limitations, or may operate under a firm service level agreement under their utility program.

⁵ Market participants describe dispatch instructions that do not recognize their operational limitations of only a certain amount of startups per day as an “infeasible dispatch.”

⁶ Section 4.13.5.2.2 of the CAISO tariff.

⁷ In some cases, an RDRR may register as continuous due to the cap constraint when the resource more accurately operates as a discrete-dispatch RDRR.

⁸ Though the first proposal is severable, the second is contingent on the first. This is because the CAISO’s previous concerns regarding an increased imbalance risk caused by an increase to the RDRR discrete-dispatch cap will be solved with the PMin re-rate functionality proposed under Section III.B.

after November 1, 2022, but no later than December 1, 2022, and subject to the CAISO filing a subsequent notice of the actual effective date.⁹

I. Background

A. History of RDRRs

Resources may provide load curtailment in the CAISO's market through two demand response models: the proxy demand resource ("PDR") model, or the RDRR model. A PDR is an economically dispatched demand response resource, but the CAISO only enables an RDRR, the subject of this filing, for dispatch when the CAISO's system experiences a significant transmission or system emergency.¹⁰ The CAISO implemented the RDRR product in its market in 2012 as a result of a multi-party settlement ("Settlement") approved by the California Public Utility Commission ("CPUC") to integrate utility retail emergency-triggered demand response programs into the CAISO market.¹¹ The CAISO, California investor-owned utilities, ratepayer advocates, large customers, and demand response providers were parties to the Settlement.

The Settlement specified the "design [of RDRRs] will accommodate the primary features of the existing IOU reliability-based DR programs."¹² Utilities would thus have the option to specify that the CAISO could only dispatch an RDRR to its full potential load reduction, known as its PMax.¹³ The CAISO implemented this through market rules that allow a utility to elect that the CAISO model and dispatch an RDRR as "discrete-dispatch."¹⁴ For example, the real-

⁹ The CAISO plans to implement the proposed enhancements on November 1, 2022, but desires flexibility regarding implementation if there is some delay.

¹⁰ Section 34.7(13) of the CAISO tariff.

¹¹ *Order Instituting Rulemaking Regarding Policies and Protocols for Demand Response, Load Impact Estimates, Cost-Effectiveness Methodologies, Megawatt Goals and Alignment with California Independent System Operator Market Design Protocols* (January 25, 2007), Rulemaking 07-01-041.

¹² See Joint Motion for the Adoption of Settlement (Feb. 22, 2010) in Rulemaking 07-01-041; Attached settlement at pt. 14.

¹³ As opposed to a lesser dispatch like half of its potential load reduction.

¹⁴ On May 20, 2011, the CAISO filed its initial tariff amendment with the Commission to implement the RDRR model (See Docket No. ER11-3616). As the Commission had recently issued Order No. 745 (*Demand Response Compensation in Organized Wholesale Energy Markets*, FERC Order No. 745, 134 FERC ¶ 61,187 (2011)), it rejected the CAISO's RDRR proposal (*Cal. Indep. Sys. Operator Corp.*, 138 FERC ¶ 61,117 (2012)). The CAISO then submitted, on March 14, 2012 and in the same docket, a compliance filing for the RDRR product and Order No. 745. The Commission issued an order on July 18, 2013 accepting in part and denying in part the CAISO's compliance filing, and directed the CAISO to submit a further compliance filing (*Cal. Indep. Sys. Operator Corp.*, 144 FERC ¶ 61,047 (2013), P 62 fn. 47 (July 2013 Order)). On August 19, 2013, the CAISO submitted a subsequent filing in compliance with

time market can only dispatch a 50 MW discrete-dispatch RDRR with a 50 MW energy bid in the real-time market to 0 MW of load reduction (it's PMin) or 50 MW of load reduction (it's PMax). In contrast, selecting the "continuous-dispatch" option, also known as the marginal real-time dispatch option, indicates that the RDRR can operate anywhere in its operating range and may receive day-ahead or real-time market schedules.¹⁵ The CAISO's discrete-dispatch option is critical for large industrial, air-conditioning, and agricultural pumping load programs that cannot operate up and down between a PMin and PMax.

Initially, the CAISO set a registration cap of 50 MW on resources that elect the discrete-dispatch option to limit safety and reliability impacts of these block resources. A size limit prevents operational challenges that may occur when the load underlying a discrete-dispatch RDRR comes online after a demand response dispatch has ended. An RDRR "shutdown" can create a more significant impact than other resource shutdowns because the RDRR's capacity can immediately come back online as load. This can be especially problematic because the CAISO may still be in emergency conditions at the end of a large RDRR's dispatch, and the sudden return of such a load in those conditions may exacerbate them.

The CAISO continues to improve the RDRR model to ensure feasible dispatches during a system emergency and efficiently dispatch these resources without suppressing prices. Most recently, the CAISO amended its tariff¹⁶ to increase the hard energy bid cap for RDRR resources to help ensure the CAISO only dispatches RDRRs among the last resources in light of changes provided by FERC Order 831.¹⁷

B. RDRR Real-Time Challenges

Although the CAISO rarely sees the emergency conditions that would warrant enabling RDRRs, the CAISO, utilities, and demand response providers have observed instances where RDRRs have received challenging or infeasible dispatches, namely being dispatched to their minimum operating level and then

the July 2013 Order, which the Commission accepted (*Cal. Indep. Sys. Operator Corp.*, 146 FERC ¶ 61,205 (2013)).

¹⁵ Section 30.6.2.1.2.1 of the CAISO tariff.

¹⁶ See Docket No. ER22-1431.

¹⁷ Order No. 831 directed ISOs and RTOs to implement requirements as to (1) offer cap structure, (2) a verification process for cost-based offers for energy above minimum load, (3) resource neutrality, and (4) virtual transactions and external transactions (i.e., imports).

back up to their maximum operating level.¹⁸ During an analysis of the August 2020 load shedding events, the CAISO found that RDRRs were manually dispatched by the CAISO system operators instead of through the CAISO markets.¹⁹ These manual dispatches could suppress prices during tight supply conditions because they cause the market optimization to see the resulting drop in demand.

The PMin of a discrete dispatch RDRR can affect its dispatches just as much as the PMax because it establishes the initial commitment level for the CAISO's market optimization. In committing an RDRR at PMin, the CAISO markets price the RDRR based on its minimum load cost, which the CAISO tariff defines as the costs a resource incurs operating minimum load, *i.e.* the minimum level at which it can operate at a continuous sustained level.²⁰ The CAISO tariff currently requires RDRRs to register a PMin of zero because they can be "online" and able to respond to a real-time dispatch even at 0 MW, as opposed to a combined-cycle generator that cannot be online unless it has started and begun operating with minimum output.²¹ However, where the PMin of an RDRR is set at zero, the resource can be committed as a zero cost resource at PMin, resulting in dispatch instructions that toggle between PMin and PMax multiple times under a single start-up instruction. Moreover, any movement to a PMin of zero may appear as a shut down to the RDRR because its PMin is the same as it not curtailing any load. From the CAISO's perspective, a resource with zero PMin is considered to be online unless it operates at zero for the entire operating interval.

The CAISO market rules do not allow the real-time market to model a minimum operating level and associated costs for RDRRs.²² The CAISO explored with stakeholders such an option, but the CAISO and stakeholders

¹⁸ In 2021, for example, the CAISO did not enable RDRRs. Although the reliability coordinator declared a level two NERC Energy Emergency Alert on July 29, 2021, CAISO operators mitigated the emergency using other resources.

¹⁹ CAISO, CPUC, and California Energy Commission (CEC), *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave* (Jan. 13, 2021), available at: <http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf>.

²⁰ Appendix A to the CAISO tariff.

²¹ As an example. Many other resources have PMin at or above zero, but without the issues RDRRs experience.

²² Section 30.6.2.1.2 of the CAISO tariff states that a "A Reliability Demand Response Resource that is subject to either the Marginal Real-Time Dispatch Option or the Discrete Real-Time Dispatch Option shall have a Default Minimum Load Bids of zero (0) dollars registered in the Master File." If these resources cannot register a cost, they will not specify a PMin of anything but zero. Price-responsive demand response resources are separately able to use the Proxy Demand Resource model.

agreed that RDRR bids are not cost based and the retail tariffs underpinning RDRR do not incorporate the concept of minimum load.²³ The CAISO's proposed enhancements focus on developing the functionality for the CAISO's optimization to recognize RDRRs' actual operational capabilities. These proposed enhancements will enable the CAISO to dispatch RDRRs through the markets, thereby enhancing pricing signals during tight supply conditions.

II. Proposed Changes

A. Discrete-Dispatch PMin Re-Rate

1. Infeasible Dispatches

To prevent infeasible dispatches and effectively respect the dispatch limitations of discrete-dispatch RDRRs, the CAISO proposes to model the PMin of a discrete-dispatch RDRR at just below the RDRR's upper economic limit (*i.e.*, the maximum capacity limit in its bid). The CAISO believes developing the functionality to recognize RDRR operational capabilities is consistent with RDRRs' original design, and it supports market dispatch rather than exceptional dispatch.

The CAISO's existing real-time market constraint that limits the number of times the market can start a resource over a day is ineffective for discrete-dispatch RDRRs because RDRRs do not have a minimum load value modeled in the market and are shown to have a PMin of zero. Utilities, however, view any dispatch to zero as a shutdown. The CAISO, however, sees this as a feasible award committing the capacity of the resource. The real-time market can thus dispatch a discrete-dispatch RDDR to a 0 MW load reduction in an interval after the real-time market has dispatched it to reduce load and then subsequently dispatch it to reduce load again. In this case, the real-time market sees the dispatch to 0 MW as merely dispatching the RDRR to its minimum operating level, rather than seeing it as a shutdown and the following dispatch to reduce load as another "start." In general, the market will consider a resource with zero PMin and zero commitment costs to be online, even at zero, unless it is at zero for the entire period. Thus, although the discrete-dispatch RDRR may have a startup limitation reflected in its Master File, the market sees these up and down dispatches as observing that limitation. However, the utilities' retail demand response program rules view a dispatch to 0 MW as a shutdown, and they view any following dispatch as an additional, new dispatch. Too many dispatches from zero to another value may then exceed the maximum number of load

²³ Early in the stakeholder initiative, the CAISO posed a series of questions to stakeholders seeking feedback on calculating minimum load costs and if they should be included. See *RDRR Bidding Enhancements: Issue Paper / Straw Proposal* (Oct. 29, 2021), at pg. 6, available at <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Reliability-demand-response-resource-bidding-enhancements>.

reduction events allowed under the utility's program. Many RDRRs, for example, are eligible for only one four-hour dispatch per day. Realizing this problem may occur, CAISO operators have sometimes manually dispatched RDRRs with a single schedule at PMax. This practice burdens operators during an emergency and can lead to pricing disruptions from out-of-market dispatches.

For example, consider a discrete-dispatch RDRR that submits a bid of 50 MW. The real-time market may dispatch the resource to 50 MW of load reduction in one market interval, 0 MW of load reduction in the next market interval, and then back to 50 MW of load reduction in the third market interval. The CAISO's optimization sees these schedules as a single dispatch, with the RDRR merely ramping up, then down, then back up. However, the RDRR operator and the utility see any dispatch to 0 as the end of a dispatch and the "ramp" back to 50 MW as a new dispatch that may violate how many times the RDRR may start during an operating day.

2. Proposed Tariff Amendment

The CAISO proposes to correct this dispatch issue by modeling a minimum load for discrete-dispatch RDRRs in the real-time market. This minimum load value will be just below the RDRR's load reduction bid into the market for an hour (*i.e.*, the upper economic limit of the bid).²⁴ The CAISO will administratively set this value automatically through existing PMin-rerate functionality in the optimization, and it will not require additional action on behalf of the participant.²⁵

The following simple example demonstrates how the proposed PMin re-rate functionality solves the infeasible dispatch issue.²⁶ Figures 1-3 represent a resource with a PMax of ten (10) MW, PMin of zero (0) MW, a daily number of start-ups of one, and a maximum daily run time of five hours. In **Figure 1** the resource is dispatched at hour ending (HE) 16 and is contiguously on for five hours, which respects the max run time parameter. In **Figure 2** the resource is again dispatched starting in HE16 and is moved between its upper economic limit and lower economic limit (PMin) over the course of five hours. This also

²⁴ Proposed Section 30.6.2.1.2 of the CAISO tariff. The upper capacity capability for demand response, unlike other resources, is variable and can be dynamic based on time of day and day of week. Thus, the proposal is keyed to the bid quantity rather than the PMax held in the Masterfile, which is static.

²⁵ Such as changing PMin values in the Master File. The CAISO's proposed revisions will preserve accurate descriptions of operating characteristics in the Master File while ensuring the optimization dispatches resources correctly. Under this proposed amendment, there could still be very slight movement between the upper economic limit to the re-rated PMin, but the difference would be negligible.

²⁶ A similar example is also available in Attachment C, Final Proposal, pg. 6.

represents the market respecting the max daily run time parameter. In both examples, the CAISO considers these dispatches to respect the start-up limitation. To the RDRR, however, the dispatches at zero are shutdowns.

Figure 3 demonstrates how the CAISO’s proposed solution of a PMin re-rate and value for minimum load cost help resolve the infeasible dispatch issue.²⁷ In this example, rather than dispatching the RDRR to a PMin of zero in HE17 and HE19, because of the re-rated PMin limits, the market respects the operational limitations of the resource.

Figure 1: Discrete contiguous dispatch in the real-time market today

	HE15	HE16	HE17	HE18	HE19	HE20	HE21
Available Qty	2	4	6	6	6	4	4
RT Dispatch Qty	0	4	6	6	6	4	0

Figure 2: Discrete non-contiguous dispatch in the real-time market today

	HE15	HE16	HE17	HE18	HE19	HE20	HE21
Available Qty	2	4	6	6	6	4	4
RT Dispatch Qty	0	4	0	6	0	4	0

Figure 3: Proposed PMin re-rate and value for minimum load cost

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

This PMin re-rate solves the infeasible dispatch issue; however, because RDRRs have a \$0 minimum load cost, the resource would appear to be “free” for a large dispatch.²⁸ To avoid this result, the CAISO proposes to add the value of the product of the bid price multiplied by the upper economic limit to the existing minimum load cost (\$0).²⁹ In this way, the CAISO will enable the market to

²⁷ This 0.1 MW reduction is administratively set. See *supra*, footnote 25.

²⁸ See *supra*, footnote 22.

²⁹ Proposed Tariff Section 30.6.2.1.2 includes new language outlining this formula. The CAISO proposes to allow this administrative value to be configurable. While initially the CAISO anticipates clarifying this value as a 0.1 MW reduction in the Business Practice Manuals, allowing for some flexibility to fine-tune to achieve desirable outcomes will be advantageous. As this serves only to limit infeasible dispatches, the administrative value of the reduction of upper economic limit to set the PMin does not have a material impact on settlement.

commit discrete-dispatch RDRRs like a generator with a non-zero PMin and recognize that the resource is not “free” to start.³⁰

Consider again the above example in which a discrete-dispatch RDRR has submitted a bid to provide its PMax of 6 MW for one hour at \$950/MWh (HE17 in Figure 3, for example). Under the CAISO’s proposed enhancements, the real-time market would see the RDRR’s true PMin of zero, but it would not schedule the RDRR below 5.9 MW. The market will adhere to the energy bid price the scheduling coordinator submitted in calculating the minimum load amount. Thus, the CAISO will set the minimum load value to $(\$950/\text{MWh}) \times (5.9 \text{ MW}) = \$5,605/\text{hour}$, following the formula that adds the value of the product of (the bid price)*(the upper economic limit) to the existing minimum load cost. The CAISO will consider this value the resource’s commitment costs.

The CAISO’s proposed amendments respect RDRRs’ operational limitations and the underlying utility programs. They ensure the market does not inadvertently create infeasible dispatches based on a misleading PMin of zero. These proposed amendments are also practical because they leverage existing market functionalities, enabling the CAISO to implement the software upgrades on an expedited basis. This will help ensure the CAISO can issue feasible dispatches to RDRRs through the markets to help preserve reliability in an emergency.

B. Increasing Discrete Dispatch RDRR Capacity Cap

The CAISO also proposes to increase the maximum allowable size of discrete-dispatch RDRRs from 50 MW to 100 MW.³¹ This change will allow demand response providers to reflect the actual size of their RDRRs in the real-time market without having to utilize multiple resource IDs. This will capture larger resources not currently capable of participating due to operational limits above the current cap.

Although the CAISO believes it can reliably dispatch larger discrete-dispatch RDRRs, a limit on the size of discrete-dispatch RDRRs remains appropriate given the operational challenges that may occur when the load underlying a discrete-dispatch RDRR comes online after a demand response

³⁰ The market would then publish the PMin re-rate and minimum load cost to pre-settlement systems for bid cost recovery purposes. Mirroring RDRR’s current bid cost recovery eligibility, only 5-minute and 15-minute RDRRs will be eligible. Section 11.6.4 of the CAISO tariff.

³¹ Proposed Tariff Section 4.13.5.2.2 revises the discrete-dispatch RDRR limit from 50 MW to 100 MW.

dispatch has ended.³² The CAISO thus proposes to maintain a “soft cap” of 100 MW for discrete-dispatch RDRRs.

In cases where the CAISO can still ensure safety and reliability, the CAISO proposes to allow discrete-dispatch RDRRs even above the 100 MW cap.³³ The CAISO proposes that a discrete-dispatch RDRR’s scheduling coordinator must attest to certain criteria when requesting such an exemption:

- the RDRR is located at a single site;
- the RDRR’s underlying load cannot be safely or operationally split;³⁴ and
- the RDRR is unable to operate continuously based on the source of load providing curtailment.³⁵

The CAISO will review the scheduling coordinator’s attestation and any supporting information to determine if there is a potential for detrimental market or operational impacts associated with allowing the particular resource to register above the 100 MW cap. The CAISO will consider such requests in the context of existing market and operating conditions to determine whether material operational impacts to safety and reliability may exist when, for example, the resource comes back online. Specifically, the CAISO will look at the load of the sub-load aggregation point in which the RDRR is located in and the proportional size of that resource to evaluate whether there will be impacts. The CAISO will not approve requests from RDRRs that are more likely than not to affect a constraint on the system. Based on conversations with utilities, the CAISO believes there are relatively few 100+ MW discrete-dispatch RDRRs, and the CAISO anticipates it can accommodate most, if not all, of them reliably.

The CAISO’s proposed amendment is just and reasonable because it will result in more accurate modeling of large RDRRs while preserving reliability in emergency conditions.

III. Stakeholder Feedback

Stakeholders generally support the CAISO’s proposal. Utilities, demand response providers, and the California ISO Department of Market Monitoring (“DMM”) provided comments stating the CAISO’s proposal more effectively recognizes the value of RDRR resources by raising the cap and solving the

³² These challenges are previously described in Section I.A of this transmittal letter.

³³ Proposed Section 4.13.5.2.2 of the CAISO tariff.

³⁴ Many RDRRs consist of many separate, “severable” loads. These RDRRs generally do not need to exceed the 100 MW cap because the scheduling coordinator can separate them into different Resource IDs under the cap.

³⁵ *I.e.*, The load is on or off only; it cannot operate between its PMin and PMax.

existing infeasible dispatch issue. DMM further recommended the CAISO consider allowing continuous RDRR to reflect a minimum load cost in a future RDRR initiative.

The CAISO stakeholder process leading to this filing began with posting a combined issue paper/straw proposal on November 1, 2021, with a web conference on November 4, 2021. The CAISO subsequently posted two revised straw proposals, a draft final proposal, and ultimately a final proposal and draft tariff language on April 12, 2022. With each of these postings the CAISO both held a stakeholder call and accepted written comments on the proposals. The stakeholder process culminated with the CAISO Governing Board approving on July 20, 2022 the policy proposal underlying this filing.

IV. Effective Date

The CAISO respectfully requests the Commission issue an order by October 22, 2022, accepting the proposed tariff revisions to be effective on or after November 1, 2022, but no later than December 1, 2022.³⁶ This will provide sufficient advance notice and time for market participants and the CAISO to prepare for implementing these changes. Consistent with Commission precedent recognizing the actual implementation date of some market rule changes depend on variables that cannot be fully predicted in advance and additional time may be needed to implement some market rule changes, the CAISO further requests authorization to inform the Commission of the actual effective date of the tariff changes through a subsequent filing within five business days following their implementation.³⁷

³⁶ The CAISO plans to implement the proposed enhancements on November 1, 2022, but desires flexibility regarding implementation if there is some delay.

³⁷ See *Cal. Indep. Sys. Operator Corp.*, 172 FERC ¶ 61,263 at PP 1, 39 (2020). The CAISO has included an effective date of 12/31/9998 as part of the tariff records submitted in this filing. The CAISO will notify the Commission of the actual effective date of these tariff records within five business days of implementation in an eTariff submittal using Type of Filing code 150 – Report.

V. Communications

Under Rule 203(b)(3),³⁸ the CAISO respectfully requests that all correspondence and other communications about this filing be served upon:

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VI. Service

The CAISO has served copies of this filing on the CPUC, the California Energy Commission, and all parties with scheduling coordinator agreements under the CAISO tariff. In addition, the CAISO has posted a copy of the filing on the CAISO website.

VII. Contents of this filing

Besides this transmittal letter, this filing includes these attachments:

Attachment A	Clean CAISO tariff sheets
Attachment B	Redlined CAISO tariff sheets
Attachment C	Final Proposal
Attachment D	Board of Governors Memo

³⁸

18 C.F.R. § 385.203(b)(3).

VIII. Conclusion

For the reasons set forth in this filing, the CAISO respectfully requests that the Commission issue an order accepting the tariff revisions in this filing by October 22, 2022, effective as of the dates specified herein.

Respectfully submitted,

/s/ Sarah E. Kozal

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Attachment A – Clean Tariff
Reliability Demand Response Resource Dispatch
California Independent System Operator Corporation
August 22, 2022

4.13.5.2.2 RDRRs

The minimum Load curtailment of a Reliability Demand Response Resource shall be no smaller than 0.5 MW. Loads may be aggregated together to achieve the 0.5 MW threshold. The maximum Load curtailment of a Reliability Demand Response Resource that selects the Discrete Real-Time Dispatch Option shall be no larger than 100 MW. The CAISO will approve uses above 100 MW where:

- (a) the Demand Response Provider attests that the Reliability Demand Response Resource (1) is located at a single site; (2) cannot safely or operationally be split into multiple loads; and (3) does not have the ability to operate under the Marginal Real-Time Dispatch Option; and
- (b) the CAISO determines that the Reliability Demand Response Resource's use of the Discrete Real-Time Dispatch Option does not cause significant reliability issues.

There is no upper limit on the maximum Load curtailment of a Reliability Demand Response Resource that selects the Marginal Real-Time Dispatch Option.

* * * * *

30.6.2.1.2 Real-Time Dispatch Options

For purposes of bidding and scheduling in the Real-Time Market, each Scheduling Coordinator for a Demand Response Provider representing a Reliability Demand Response Resource shall select either the Marginal Real-Time Dispatch Option or the Discrete Real-Time Dispatch Option prior to the start of the initial Reliability Demand Response Services Term applicable to the Reliability Demand Response Resource. The selection for each Reliability Demand Response Resource shall remain in effect until such time as the Scheduling Coordinator for the Reliability Demand Response Resource chooses to change its selection from the Marginal Real-Time

Dispatch Option to the Discrete Real-Time Dispatch Option or vice versa, in which case the change in selection shall go into effect at the start of the next Reliability Demand Response Services Term applicable to the Reliability Demand Response Resource. A Reliability Demand Response Resource that is subject to either the Marginal Real-Time Dispatch Option or the Discrete Real-Time Dispatch Option shall have a Default Minimum Load Bids of zero (0) dollars. To promote feasible dispatches, the CAISO will set the Minimum Load of Reliability Demand Response Resources using the Discrete Real-Time Dispatch Option at an administrative value just below the upper economic limit of its Real-Time Bid. The CAISO will add to the Reliability Demand Response Resource's Minimum Load Bid a cost based on the product of this value and its Real-Time Bid price.

Attachment B – Marked Tariff

Reliability Demand Response Resource Dispatch

California Independent System Operator Corporation

August 22, 2022

4.13.5.2.2 RDRRs

The minimum Load curtailment of a Reliability Demand Response Resource shall be no smaller than 0.5 MW. Loads may be aggregated together to achieve the 0.5 MW threshold. The maximum Load curtailment of a Reliability Demand Response Resource that selects the Discrete Real-Time Dispatch Option shall be no larger than ~~50~~100 MW. The CAISO will approve uses above 100 MW where:

- (a) the Demand Response Provider attests that the Reliability Demand Response Resource (1) is located at a single site; (2) cannot safely or operationally be split into multiple loads; and (3) does not have the ability to operate under the Marginal Real-Time Dispatch Option; and
- (b) the CAISO determines that the Reliability Demand Response Resource's use of the Discrete Real-Time Dispatch Option does not cause significant reliability issues.

There is no upper limit on the maximum Load curtailment of a Reliability Demand Response Resource that selects the Marginal Real-Time Dispatch Option.

* * * * *

30.6.2.1.2 Real-Time Dispatch Options

For purposes of bidding and scheduling in the Real-Time Market, each Scheduling Coordinator for a Demand Response Provider representing a Reliability Demand Response Resource shall select either the Marginal Real-Time Dispatch Option or the Discrete Real-Time Dispatch Option prior to the start of the initial Reliability Demand Response Services Term applicable to the Reliability Demand Response Resource. The selection for each Reliability Demand Response Resource shall remain in effect until such time as the Scheduling Coordinator for the Reliability Demand Response Resource chooses to change its selection from the Marginal Real-Time

Dispatch Option to the Discrete Real-Time Dispatch Option or vice versa, in which case the change in selection shall go into effect at the start of the next Reliability Demand Response Services Term applicable to the Reliability Demand Response Resource. A Reliability Demand Response Resource that is subject to either the Marginal Real-Time Dispatch Option or the Discrete Real-Time Dispatch Option shall have a Default Minimum Load Bids of zero (0) dollars.

To promote feasible dispatches, the CAISO will set the Minimum Load of Reliability Demand Response Resources using the Discrete Real-Time Dispatch Option at an administrative value just below the upper economic limit of its Real-Time Bid. The CAISO will add to the Reliability Demand Response Resource's Minimum Load Bid a cost based on the product of this value and its Real-Time Bid price.

Attachment C – Final Proposal
Reliability Demand Response Resource Dispatch
California Independent System Operator Corporation
August 22, 2022



California ISO

RDRR Bidding Enhancements

Final Proposal

April 12, 2022

Prepared by:

Anja Gilbert

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1. Executive Summary

The purpose of the Track 2 Final Proposal is to better reflect Reliability Demand Response Resources' (RDRR) operational capabilities in the market. The CAISO continues to propose select enhancements to real-time bidding for discrete RDRR by:

- Addressing infeasible RDRR real-time dispatches (i.e., dispatch to a Pmin of zero) through a market enhancement, recognizing known RDRR operational capabilities. The CAISO proposes a solution for discrete RDRRs, whereby the CAISO would re-rate the resource's Pmin below the resource's upper economic limit and a formula will be used to represent to the market the resource's minimum load cost. This ensures the resource is not viewed as "free" by the market, which will help ensure feasible dispatches. This automatic adjustment will occur after the day ahead market, and will not require any action from scheduling coordinators.
- Increasing the discrete RDRR registration cap from 50 MW to 100 MW and allowing for exceptions to this cap. Any exception to the cap would require the resource to attest that it cannot be operationally or safely split, that it cannot operate continuously, that it is not an aggregated resource, as well as indicate the source of the load curtailment. This will be reviewed by the CAISO in context of existing market and operational conditions to ensure safety and reliability. The CAISO's previous concerns regarding an imbalance caused by an increase to the RDRR discrete cap are solved with the Pmin re-rate functionality being implemented and will allow for a higher discrete RDRR cap. As a result, this enhancement is contingent on the Pmin re-rate functionality being implemented.

2. Background

On June 24, 2010, in D.10-06-034 the CPUC approved a multi-party settlement in its demand response proceeding (R.07-01-041) that required investor-owned utilities to transition their CPUC-approved retail emergency-triggered demand response programs into a CAISO reliability demand response product.¹ The settlement specified the minimum operating and technical requirements for retail emergency-triggered demand response resources. The CPUC settlement also required these resources be made available for emergency operating procedures. While previously emergency demand response, like RDRR, were triggered under a "Warning" notice it will now be referred to as an "EEA 2".²

Consistent with the terms of the CPUC settlement, the CAISO developed the RDRR product. On October 26, 2010, the CAISO Board of Governors authorized the RDRR product. The Board

¹ Details on the CPUC Reliability-Based Demand Response Settlement are available at <https://docs.cpuc.ca.gov/publishedDocs/published/119817.PDF> and https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/119815.PDF

² The CAISO's Operating Procedure 4420 outlines when RDRR can be enabled into the market <http://www.caiso.com/Documents/4420.pdf>

California ISO RDRR Bidding Enhancements – Track 2 – Draft Final Proposal

of Governors memorandum approving the RDRR product specifically noted that it would enable the CAISO “to dispatch these emergency-triggered programs when and where they are needed and, appropriately, reflect their value in the [CA]ISO market.”³

Fast forward ten years to the August 2020 load shedding events, the Final Root Cause Analysis of these events found that RDRRs were manually dispatched out of market by the CAISO system operators versus through the “market” as originally envisioned.⁴ As a result, in its 2021 Summer Readiness initiative, the CAISO modified its tariff to dispatch RDRRs in the real-time pre dispatch (RTPD) market run so that RDRRs could be more optimally dispatched through the market provided they have a longer dispatch horizon. Additionally, the CAISO updated its tariff to allow RDRRs to register as 5-, 15-, or 60-minute dispatchable resources to better elect and reflect an RDRR’s operating parameters. Resources registered as 15-minute dispatchable are allowed to set the marginal energy price in the fifteen-minute market. Resources registered as 5- minute dispatchable are allowed to set the marginal energy price in RTD. These changes were accomplished by reflecting discrete RDRRs as discrete in the scheduling run, but treating them as continuous in the pricing run. Continuous RDRR’s bid curve submitted by the scheduling and pricing runs allows RDRR to set the price. RDRRs registered as 60-minute dispatchable that clears in the hour-ahead scheduling process (HASP) will receive a fifteen-minute market schedule and settle at the corresponding locational marginal price during each fifteen-minute market interval like all other HASP eligible resources.

3. RDRR Bidding Enhancements Draft Final Proposal

3.1 RDRR “Infeasible Dispatch” Issue

The CAISO in its Summer Readiness initiative modified its tariff to dispatch RDRRs in Real Time Pre-Dispatch (RTPD) so they could be optimally dispatched within a longer time horizon to increase the efficiency of the market dispatch. Market dispatch is impacted by the Pmin registration of a RDRR coupled with its minimum load costs. If the Pmin of a RDRR is set at zero, the resource can also be committed as a zero cost resource at Pmin which could result in dispatch instructions that toggle between Pmin to their upper economic limit and back to Pmin multiple times under a single start-up instruction. Any movement to a Pmin of zero may appear as a shut down to the RDRR thus producing an “infeasible” instruction for the resource. From the CAISO’s perspective, a resource with zero Pmin is considered to be on-line, even at zero, unless it operates at zero for the entire period. While this infeasible dispatch was possible prior to Summer Readiness, with the move to make RDRR dispatched by the market more often, stakeholders raised concerns that the infeasible dispatch could occur more frequently.

This initiative started by examining minimum load costs as a means of correcting the issue that RDRRs are receiving real time dispatches that may be infeasible, not from a market perspective but from the perspective of a resource. The CAISO’s hypothesis was that allowing resources to represent their minimum load cost could enable resources that have also represented the

³ The CAISO Memorandum. Decision on the Reliability Demand Response Product. October 26, 2010. <http://www.aiso.com/Documents/101101DecisiononReliabilityDemandResponseProduct-Memo.pdf>

⁴ Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave, January 13, 2021, available at: <http://www.aiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf>

California ISO RDRR Bidding Enhancements – Track 2 – Draft Final Proposal

operational capabilities of their resource as their Pmin near their Pmax, to receive compensation and appropriate dispatch. However, the CAISO has observed that RDRR bids are not cost based and the retail tariffs underpinning RDRR do not incorporate the concept of minimum load or a Pmin.

This enhancement has pivoted to focus on the infeasible dispatch issue and developing the functionality to recognize RDRRs operational capabilities. The CAISO proposed a solution for discrete RDRRs, whereby the CAISO would re-rate the resource's Pmin below the resource's upper economic limit and a formula will be used to represent to the market the resource's minimum load cost. This is to ensure that the resource is not viewed as "free" by the market, thus preventing a real time infeasible dispatch from occurring.

Proposal:

The CAISO continues to propose adjusting discrete RDRRs operating range to reflect operational capabilities by re-rating their Pmin just below the RDRRs upper economic limit. This enhancement is intended to prevent an infeasible dispatch (e.g., movement up and down between the upper economic limit of the bid and a 0 MW Pmin) of discrete RDRRs from occurring as a result of the resource appearing free as well as limitations in the current discrete dispatch functionality. In this proposed solution, while there would still be movement between the upper economic limit to the re-rated Pmin, the difference would be small enough to be negligible. This fully solves the infeasible dispatch issue but creates a challenge where the resource appears to be free for a large number of MW. To solve that issue, the CAISO plans to calculate a minimum load cost adder based on the bid.

The process will use the CAISO's systems and will not require additional action on behalf of the participant:

1. For resources without day ahead schedules, the CAISO will set the minimum operating limit to a value just below the upper economic limit of the bid (i.e., the maximum megawatt limit of the bid), using existing Pmin-rerate functionality
2. The CAISO will add the value of the product of (bid price)*(upper economic limit) to the existing minimum load cost

This proposed solution, to automatically re-rate the Pmin and input a default minimum load cost, would be automatic and compatible with all discrete RDRR bidding options (5, 15, or 60-minute dispatch options). This will enable the market to commit discrete RDRRs like a generator with a non-zero Pmin and recognize that the resource is not "free" from a startup perspective. The market would then publish the Pmin re-rate and minimum load cost to pre-settlement systems for Bid Cost Recovery purposes. Mirroring RDRR's current BCR eligibility, only 5-minute and 15-minute RDRRs will be eligible for BCR.

Examples:

Example A: State of the world today

Figure 1 and 2 below illustrate the situation RDRRs face today where in real time they can be dispatched either contiguously or non-contiguously (also referred to as “infeasible” by market participants).

Figure 1 and Figure 2 represent a resource with a Pmax of ten, Pmin of zero, a daily number of start-ups of one, a minimum runtime of one hour, and a maximum daily run time of five hours. Both figures demonstrate how the CAISO’s optimization views both scenarios as respecting the max daily run time parameter. In general, a resource with zero Pmin and zero commitment costs will be considered on-line, even at zero, unless at zero for the entire period. In Figure 1 the resource is dispatched at HE 17 and contiguously on for five hours, which respects the max run time parameter. In Figure 2, the resource is dispatched starting in HE 16 and is moved between its upper economic limit and Pmin over the course of five hours and is an example of also respecting the max daily run time parameter.

Figure 1: Contiguous dispatch in the real-time market

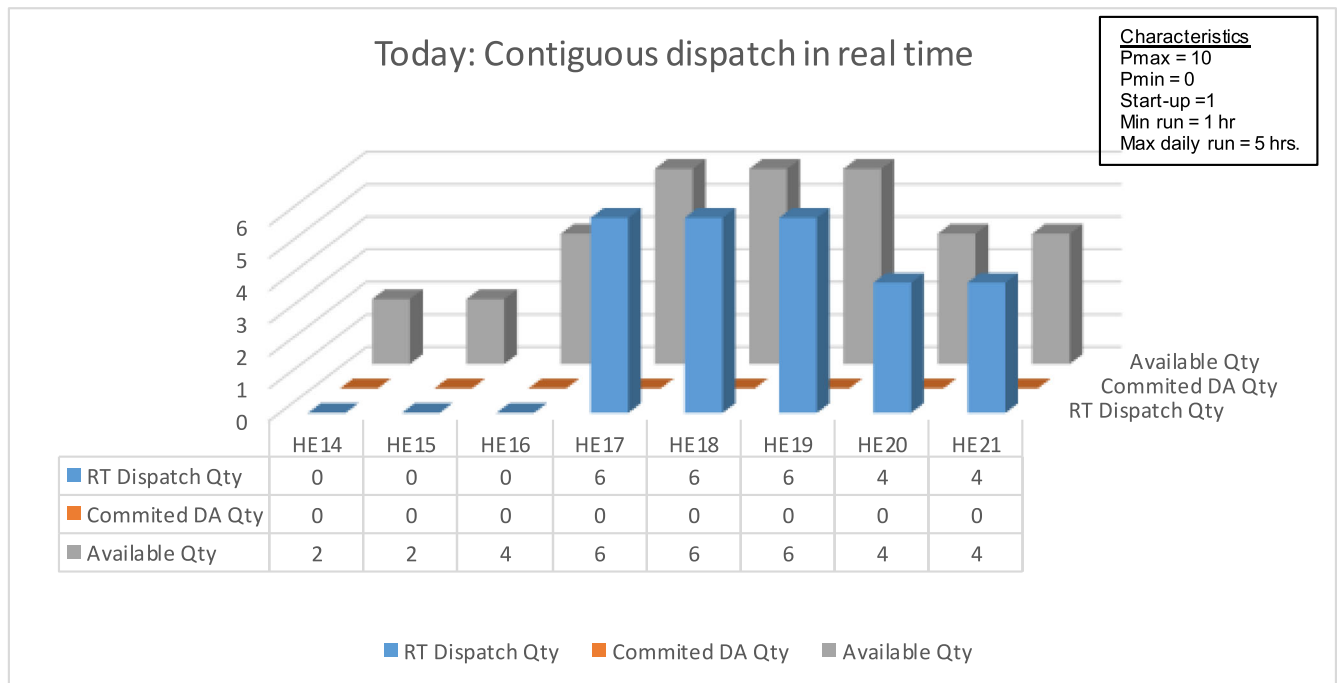
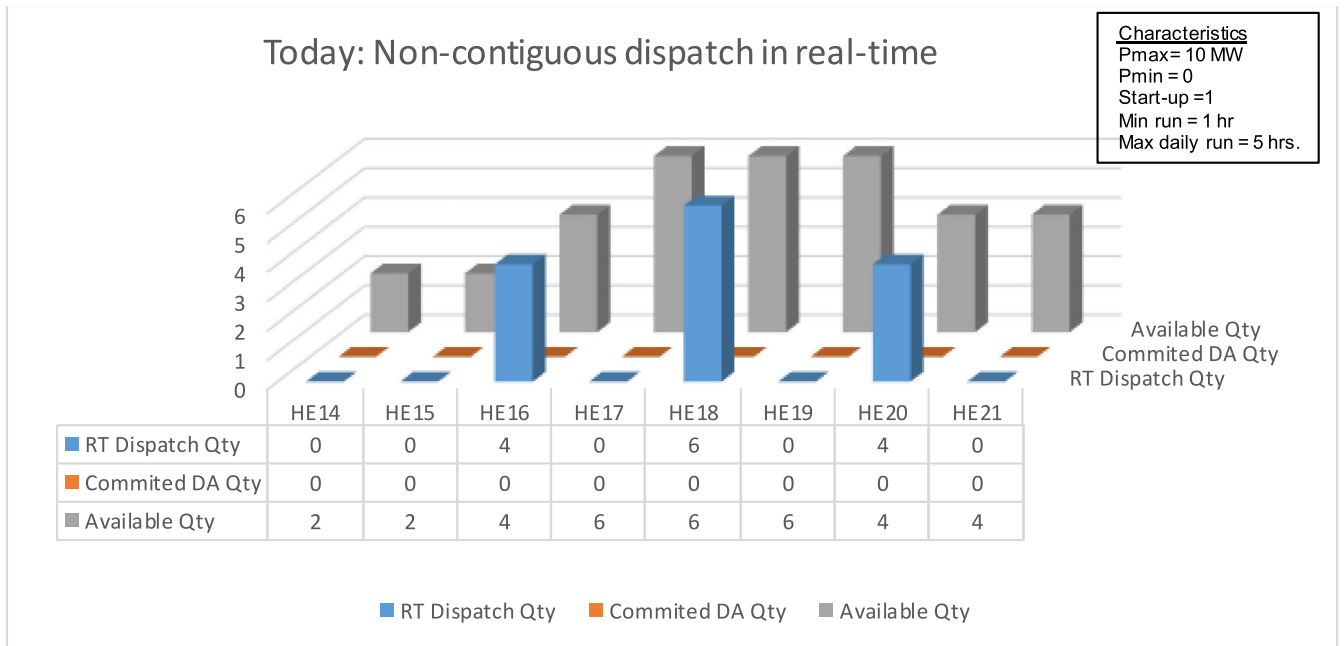


Figure 2: Non-contiguous dispatch in the real-time market



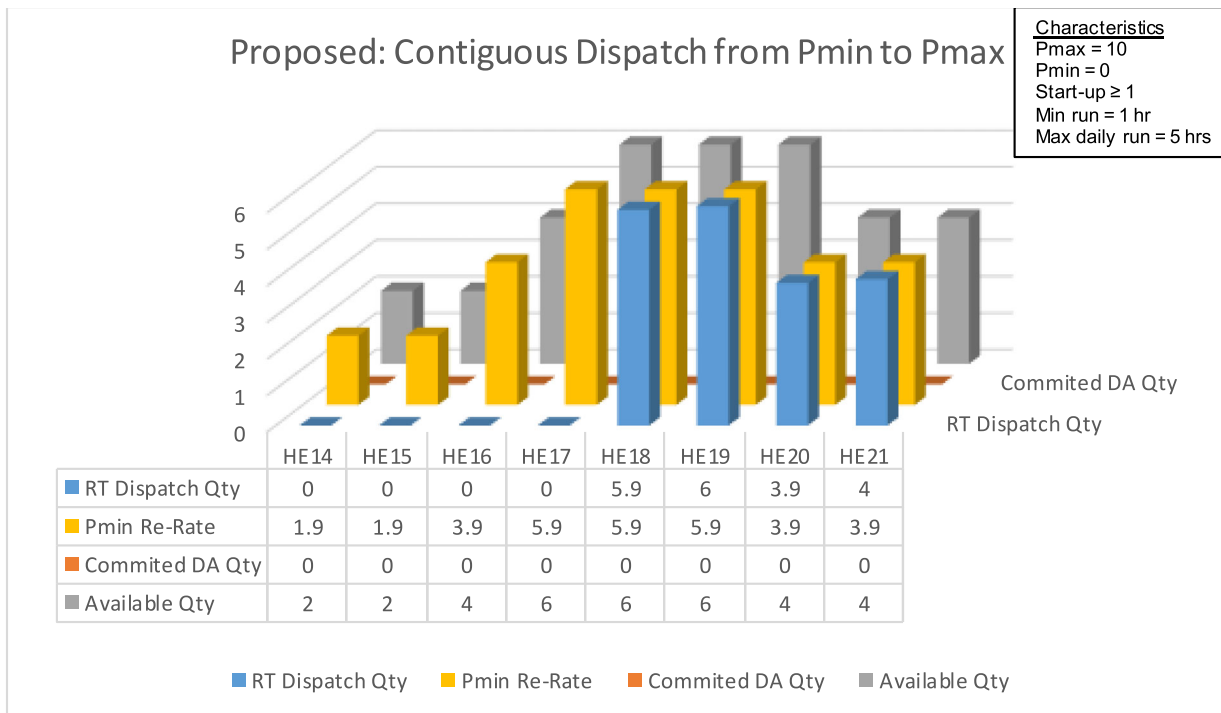
Example B: Proposed solution

This example demonstrates how the CAISO’s proposed solution of a Pmin re-rate and value for minimum load cost help resolve the infeasible dispatch issue. In this example the RDRR has a Pmax of ten, Pmin of zero, a daily number of start ups of one, a minimum runtime of one hour, a maximum daily run time of five hours, and a minimum load cost of zero. The resource has submitted real time bids for \$950 for all real time intervals. The resource does not have any day ahead awards. As a result, the CAISO will automatically:

- Re-rate the minimum operating level (Pmin, reflected as the yellow bar in Figure 3) to below the upper economic limit (bid, reflected as the grey bar in Figure 3). As a result, the market will now view the re-rated Pmin as the resources Pmin in real time.
- Set the minimum load cost to $(\$950/\text{MWh}) * (5.9 \text{ MW}) = \$5,605/\text{hour}$. The CAISO will consider this value the resource’s commitment costs.

If committed the resource could be dispatched to 5.9 MW (re-rated Pmin) or 6 MW (bid). If we look at a single interval, 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 if the resource is short over the course of the day.

Figure 3: Pmin re-rate and value for minimum load cost



Stakeholder Feedback

Both the California Energy + Demand Management Council (Council) and the Department of Market Monitoring (DMM) submitted comments supportive of the enhancement. SCE commented that the CAISO has addressed most of their concerns. The Department of Market Monitoring did suggest the CAISO could further improve RDRR modeling in a future initiative by allowing continuous RDRRs to submit non-zero minimum load costs.

Response to Stakeholder Feedback:

The CAISO appreciates the stakeholder support. In response to DMM's suggestion that CAISO allow continuous RDRRs to submit non-zero minimum load costs, the CAISO outlines some suggested preconditions for developing those minimum load costs. First, the CAISO suggests that the RDRR Settlement Agreement would need to be updated to reflect the pivot to RDRR as a cost-based resource. Second, the CAISO suggests the underlying retail tariffs that participate as RDRR would need to include the concept of minimum load. If both of these preconditions are met, the CAISO agrees that it could support exploring allowing non-zero minimum load costs for RDRRs. Alternatively, CAISO suggests price responsive demand response use the Proxy Demand Resource model.

3.2 RDRR Registration

RDRRs may register as either continuous or discrete, depending on their abilities. Discrete registration indicates the resource has one bid segment and when dispatched will generate to its Pmax. Continuous (non-discrete) registration indicates that a resource can operate anywhere between its Pmin and Pmax, based on the cleared bid quantity. The CAISO currently has a 50 MW cap on discrete RDRR, and it may only participate in the real time market. There is no cap on the size of an RDRR that is registered as continuous. Continuous RDRR may participate economically in the day ahead market. The designation in the CAISO's Masterfile as continuous or discrete may be updated once per RDRR season.⁵ It is a product of the RDRR settlement agreement that the CAISO allows RDRR to bid as a discrete resource. In general, blocky discrete resources do not promote efficient market outcomes—discrete bidding is an exception afforded to RDRRs and the constrained output generator (COG) model.

The current discrete RDRR cap exists to mitigate the discrete-to-continuous treatment. As described in the Market Enhancements for Summer 2021, the move towards minimizing exceptional dispatch of RDRRs and increasing the market dispatch included making changes to allow 15-minute and 5-minute dispatchable discrete RDRR to set market prices. To allow discrete resources to set the prices, the CAISO reflects these resources as discrete in the scheduling run, but treats them continuous in the pricing run.⁶

Every resource that uses the discrete option it has to potential to create an imbalance. For example, the market may need to dispatch a resource at 25MW when in reality the resource can be at 50MW. The delta creates an inconsistency in the market which will drive some pricing problems and can also create an imbalance between what the market does and what the actual system sees. When this results in an imbalance (*i.e.*, energy generated does not equal energy consumed), area control error (ACE) could increase or decrease from zero, which can result in frequency deviations. If a discrete-continuous imbalance occurs it has to be absorbed in the CAISO's system through ACE or regulation. Larger impacts would require the CAISO to procure more regulation or take actions outside of the market more frequently.⁷

From a pricing perspective, when a discrete resource sets prices in the pricing run it will most often set a higher price than the price that the final and most expensive continuous resource dispatched in the scheduling run would have set. Coupled with a \$0/hr min load cost, any final continuous resources in the bid stack will be dispatched to a point on their bid curve where their bid cost is less than the price set by the discrete resource. Thus the final continuous resource, whose costs are less than the price they could receive from the market have an incentive to deviate from dispatch instruction. The delta creates an inconsistency in the market which will

⁵ A season is a six month period (summer and winter). Once selected, the status shall be maintained throughout the season.

⁶ Market Enhancements for Summer 2021 Readiness Final Proposal, California ISO, March 19, 2021, p. 33: <http://www.caiso.com/InitiativeDocuments/FinalProposal-MarketEnhancements-Summer2021Readiness.pdf>

⁷ Such actions could include load conformance, which refers to the process of updating the load forecast to account for observed system conditions.

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drive some pricing problems and can also create an imbalance between what the market does and what the actual system sees.

As stated in the Draft Final Proposal, the CAISO observes that the imbalance issue identified as a challenge with increasing the cap is mitigated if the Pmin re-rate functionality is implemented. This is because the Pmin re-rate changes what the pricing run sees as available and eliminates the imbalance between the pricing run and scheduling run. So for example when previously a resource was hypothetically seen in the pricing run as operating as continuously and dispatched at 5 MW when it was actually 50 MW in size, a 45 MW imbalance could occur. However, with the Pmin re-rate functionality, the pricing run will see the resource as 49.9 MW and as 50MW in the scheduling run producing a possible imbalance of 0.1 MW.

Proposal:

The CAISO continues to propose to increase the discrete RDRR cap to 100 MW. In light of the mitigating measures produced by the Pmin re-rate functionality, the increase to the discrete RDRR cap is conditional on the Pmin re-rate functionality being implemented. The CAISO will also allow discrete RDRRs above 100MW, so long as they submit an affidavit as a part of the Master File registration process that attests:

- The RDRR resource is located at a single site;
- The RDRR load cannot be safely or operationally split;
- The RDRR does not have the ability to operate continuously based on the source of load providing curtailment; and
- To the type of load or technology providing load curtailment during RDRR events.

This affidavit and any supporting information will be reviewed by the CAISO to determine if there is potential for detrimental market or operational impacts associated with allowing these resources to register above the 100 MW cap. For example, if the load size was large enough to cause material operational impacts when coming back online after the load curtailment period ended, it would cause concern for CAISO to approve a resource. The CAISO proposes that discrete RDRRs above 100 MW would need to apply for these Master File exceptions annually, to ensure that future system conditions do not create market or operational challenges. Additional details may be established during the implementation phase of the initiative.

Stakeholder Feedback:

Both The Council and DMM submitted comments in support of the increase to the discrete RDRR cap to 100 MW and the provision to allow for exceptions if certain criteria is met. SCE acknowledged the CAISO addressed most of their concerns.

Response to Stakeholder Feedback:

The CAISO appreciates the stakeholder support of this policy.

3.3 Other Issues

Stakeholder Comments:

SCE and PG&E submitted comments related to two of SCE’s open CITI tickets described as: 1.) the policy change to use the 5/15/60 minute notification option instead of the master file start up time for RDRRs and 2.) use limited status for RDRRs and the issue that RDRRs are not able to submit outage cards for hourly/monthly/annual use limitations.

Feedback to Stakeholder Comments:

The first issue, regarding the CAISO’s use of default notification time rather than the default start-up time for 5/15/60 minute dispatch, goes back to the ESDER 3 policy. In ESDER 3, PDRs were treated similar to 60-minute and 15-minute dispatchable inter-tie resources. There are tradeoffs to being a 60-minute dispatchable inter-tie resource. For example, a 60-minute PDR resource gets a fixed dispatch which is communicated in advance, in exchange for no BCR. A 15-minute PDR resource gets a fixed dispatch for a shorter period but must be capable of ramping very quickly between 15-minute intervals with less notification time. For the summer 2021 Enhancements, existing PDR dispatch options were extended to RDRR along with the functionality implemented with those options including assumptions used in RTM for purposes of making commitment decisions. The CAISO will work to understand the magnitude of the issue highlighted by SCE for their RDRRs and seek a resolution through the CITI ticket process.

The second issue, pertaining to which outage card should be used for RDRR and if RDRR will receive use limited status, will be resolved through the CITI ticket process and a BPM update. The CAISO does not plan to change its policy that RDRRs are not use limited.

4. Western Energy Imbalance Market (WEIM) Governing Body Role

This initiative proposes changes in the representation of discrete RDRR to the CAISO market. The CAISO staff believes that the WEIM Governing Body has joint authority with the Board of Governors over each of these elements.

The role of the WEIM Governing Body with respect to policy initiatives changed on September 23, 2021, when the Board of Governors adopted revisions to the corporate bylaws and the Charter for WEIM Governance to implement the Governance Review Committee’s Part Two Proposal. Under the new rules, the Board and the WEIM Governing Body have joint authority over any proposal to change or establish any CAISO tariff rule(s) applicable to the WEIM Entity balancing authority areas, WEIM Entities, or other market participants within the WEIM Entity balancing authority areas, in their capacity as participants in EIM. This scope excludes from joint authority, without limitation, any proposals to change or establish tariff rule(s) applicable only to the CAISO balancing authority area or to the CAISO-controlled grid. Charter for WEIM Governance § 2.2.1.

California ISO RDRR Bidding Enhancements – Track 2 – Draft Final Proposal

The tariff changes to implement the elements of this initiative would be “applicable to EIM Entity balancing authority areas, EIM Entities, or other market participants within EIM Entity balancing authority areas, in their capacity as participants in EIM.” WEIM balancing authority areas may use the RDRR model assuming they have approval from their local regulatory authority and meet the requirements of RDRR participation. Accordingly, the proposed changes to the RDRR model fall within the scope of joint authority.

This proposed classification reflects the current state the initiative and could change as the stakeholder process moves ahead. The CAISO did receive comments from PG&E regarding this misalignment with the current BPM language. The CAISO plans to update the RDRR BPM to align with this WEIM governing body role during the implementation phase.

5. Stakeholder Engagement Plan

Date	Track 2 Milestone
4/12/2022	Publish final proposal an draft tariff language
4/18/2022	Stakeholder conference call on final proposal an draft tariff language
4/28/2022	Comments due on final proposal an draft tariff language
7/20/2022	Present RDRR Bidding Enhancements to Joint Session of WEIM Governing Body and CAISO Board

6. Next Steps

The CAISO will hold a stakeholder call on April 18, 2022 to review this Final Proposal and the accompanying draft tariff language. The CAISO encourages all stakeholders to submit comments on the final proposal and draft tariff language by April 28, 2022.

Attachment D – Board of Governors Memo
Reliability Demand Response Resource Dispatch
California Independent System Operator Corporation
August 22, 2022



Memorandum

To: ISO Board of Governors and WEIM Governing Body

From: Anna McKenna, Vice President of Market Policy and Performance

Date: July 13, 2022

Re: Decision on reliability demand response resource bidding enhancements – phase 2

This memorandum requires ISO Board of Governors and WEIM Governing Body action.

EXECUTIVE SUMMARY

Management proposes two changes to the ISO real-time market rules related to reliability demand response resources (RDRRs). These enhancements will result in the real-time market better respecting RDRRs' operational characteristics, which will enable the resources to be dispatched through the market instead of through the current practice of exceptional dispatch. Dispatching RDRRs through the market will provide enhanced pricing when these resources are dispatched. Both of these changes apply to RDRRs modeled and dispatched under the ISO's "discrete dispatch" option for RDRRs. The discrete dispatch option specifies that the real-time market only dispatch an RDRR to its full capacity.

First, Management proposes to ensure that real-time market dispatches respect the maximum number of times a discrete dispatch RDRR can be dispatched per day, which is generally once. This will be accomplished by modeling a minimum load for discrete dispatch RDRRs, which will prevent the real-time market from producing infeasible dispatches that dispatch these resources back and forth between reducing and not reducing load in consecutive market intervals.

Second, Management proposes to allow discrete dispatch RDRRs to be up to 100 MW in size, or larger if they meet certain criteria. The ISO currently limits the discrete dispatch option to RDRRs no larger than 50 MW. This change will allow the utilities to better reflect the actual size of their demand response resources.

The enhancements proposed in this memorandum result from the second phase of the ISO's *Reliability Demand Response Resource Bidding Enhancements* stakeholder initiative and are specifically designed to address certain stakeholder concerns that the

current design does not adequately respect the program characteristics of discrete dispatch RDRRs. The ISO Board of Governors and WEIM Governing Body already approved Management's proposed changes from the first phase of this initiative on March 9, 2022, which pertained to energy bid prices for RDRR energy bids when the ISO is accepting energy bids up to \$2,000/MWh. FERC approved the ISO's proposed changes on May 24, 2022.

Moved, that the ISO Board of Governors and WEIM Governing Body approve the reliability demand response resource bidding enhancements phase 2 proposal as described in the memorandum dated July 13, 2022; and

Moved, that the ISO Board of Governors and the WEIM Governing Body authorize Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposal described in the memorandum, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Commission guidance in any initial ruling on the proposed tariff amendment.

BACKGROUND

The ISO implemented the RDRR product in its market in 2012 as a result of a multi-party settlement approved by the California Public Utility Commission (CPUC) to integrate utility retail emergency-triggered demand response programs into the ISO market. These are programs such as interruptible industrial, air-conditioning, and agricultural pumping load programs. These programs generally limit the number of times the utility can call on the load reduction.

The 2012 CPUC RDRR settlement also provided that utilities would have the option to specify that the ISO could only dispatch an RDRR to its full potential load reduction. The ISO subsequently implemented this through market rules that allow a utility to elect the ISO model and dispatch an RDRR under either the "discrete dispatch" or "continuous dispatch" option. The ISO real-time market can only dispatch discrete dispatch RDRRs to the full amount of load reduction bid into the real-time market. For example, if the real-time market can only dispatch a 50 MW discrete dispatch RDRR with a 50 MW energy bid in the real-time market, the market could only dispatch it to 0 MW of load reduction or 50 MW of load reduction. In contrast, the "continuous dispatch" option indicates the RDRR can operate anywhere in its operating range and may be dispatched either in the day-ahead or real-time market. Additionally, the ISO market rules do not currently allow the real-time market to model a minimum operating level and associated costs for RDRRs.

The utilities must submit energy bids for RDRRs to the ISO's real-time market that are priced at 95 percent of the ISO's energy bid cap. However, these resources are not automatically dispatched and the ISO only enables RDRRs for dispatch in the real-time market when it has declared an energy emergency alert.

Given the inability of the ISO market rules to account for these RDRR operational limitations, ISO operators have in the past relied on exceptional (manual) dispatches to access these resources during tight supply conditions. As part of the analysis of the August 2020 load shedding events, the ISO identified that this practice could suppress prices during tight supply conditions. As part of the Market Enhancements for Summer 2021 Readiness initiative, Management identified that market rule enhancements were needed to enable RDRRs to be dispatched through the market, which leads to inefficient pricing during tight supply conditions. After implementing these enhancements, stakeholders identified the issues related to discrete dispatch RDRRs addressed in this memorandum.

PROPOSAL

The first change Management proposes to how the ISO operates RDRRs addresses a situation that can occur where the real-time market effectively does not respect the maximum number of times a discrete-dispatch RDRR can respond to reduce load per day, which is generally once. For example, the real-time market may currently dispatch a 50 MW discrete dispatch RDRR to 50 MW of load reduction in one market interval, 0 MW of load reduction in the next market interval, and then back to 50 MW of load reduction in the third market interval. This is problematic because, although the RDRR is modeled as capable of 50 MW of load reduction for all three intervals, its retail operational characteristics actually prevent it from reducing load a second time after being dispatched to 0 MW.

This back and forth dispatch occurs because a constraint in the real-time market that limits the number of times the market can start a resource over a day is ineffective for discrete dispatch RDRRs. This is because RDRRs are not currently allowed to have a minimum load cost value modeled in the market. Consequently, the real-time market can dispatch a discrete dispatch RDDR to a 0 MW load reduction in an interval after the real-time market has dispatched it to reduce load, and then subsequently dispatch it to reduce load again at no cost. In this case, the real-time market sees the dispatch to 0 MW as merely dispatching the RDRR to its minimum operating level and the real-time market does not see the subsequent dispatch to reduce load as another "start." However, the utilities' retail demand response program rules view the subsequent dispatch to reduce load as a second dispatch to reduce load. This would exceed the maximum number of load reduction events allowed under the utility's program if, for example, the program specified load was only allowed to be reduced once per day.

Management proposes to correct this back and forth dispatch by modeling a minimum load for discrete dispatch RDRRs in the real-time market. This minimum load value will be just below the RDRR's load reduction bid into the market for an hour. For example, if 50 MW of energy bids have been submitted for a discrete-dispatch RDRR, the real-time market would model a 49.9 MW minimum load. This will prevent the real-time market from sending dispatches to discrete-dispatch RDRRs that alternate back and forth between reducing load and a 0 MW load reduction. The bid price the market will use for the minimum load amount will be the energy bid price the scheduling coordinator submitted to the real-time market for the RDRR.

The second change Management proposes is to increase the maximum allowable size of discrete dispatch RDRRs from 50 MW to 100 MW. This change was in response to stakeholder requests to allow them to better reflect the actual size of their RDRRs in the real-time market. Management also proposes the ISO would also allow discrete dispatch RDRRs larger than 100 MW if the scheduling coordinator attests the RDRR meets certain criteria and the ISO determines the resource will not create detrimental market or operational impacts. Management proposes that the ISO have the ability to annually reconsider the approval of a discrete dispatch RDRR larger than 100 MW based on reliability criteria.

This increase to the maximum allowable size of discrete dispatch RDRRs is enabled by the first change proposed in this memorandum to model a minimum load for discrete dispatch RDRRs. Currently, the way the real-time market models discrete dispatch RDRRs can result in a difference between the amount of energy the market is internally calculating it is getting from a resource and the dispatch amount sent to the resource. The current 50 MW cap limits these differences. However, the proposed change to model discrete dispatch RDRRs as having a minimum load will result in the market internally calculating that it is getting the same amount of energy, or very close to the same amount, as in the dispatch instructions sent to the resources.

Management proposes to increase the size limit of discrete dispatch RDRRs to 100 MW because the limit is no longer critical to limit these energy differences. However, a limit on the size of discrete dispatch RDRRs remains appropriate because the dispatch of these resources may displace less expensive energy from other resources. Also, a size limit is appropriate to avoid operational challenges that may occur when the load underlying a discrete dispatch RDRR comes online after a demand response dispatch has ended.

STAKEHOLDER POSITIONS

Stakeholders support Management's proposed change to allow the modeling of a minimum load for discrete dispatch RDRRs as a reasonable means of addressing the current infeasible dispatches. Stakeholders also support the increased allowable size of discrete dispatch RDRRs.

The ISO's Department of Market Monitoring (DMM) supports Management's proposal. DMM also suggests that the ISO could develop rules in a future stakeholder initiative to allow continuous dispatch RDRRs to have minimum loads. The ISO did not propose such a change in this initiative because continuous dispatch RDRRs can also participate in the day-ahead market economically based on actual costs, rather than having to bid an administratively determined \$950/MWh. Consequently, because the underlying RDRR retail tariffs do not incorporate minimum load costs, allowing a minimum load for continuous dispatch RDRRs would be complex.

CONCLUSION

Management requests the ISO Board of Governors and the WEIM Governing Body approve Management's reliability demand response bidding enhancements proposal described in this memorandum. These enhancements will ensure the real-time market better respects the discrete-dispatch RDRR's operational characteristics.