



September 18, 2020

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. ER20-\_\_\_\_-000**

**Tariff Amendment to Add Settlement Rules for Post-Day-ahead  
Exceptional Dispatch Energy Schedules**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits this tariff amendment to augment the settlement rules for exceptional dispatch energy to address a gap whereby a resource subject to an exceptional dispatch energy schedule issued in the post-day-ahead time frame may be able to exercise market power.<sup>1</sup> The CAISO identified this tariff gap in the exceptional dispatch settlement rules while working with stakeholders on how to operationalize “slow” proxy demand resources (PDRs) that are located in local capacity areas, but are unavailable for dispatch in the real-time market to meet local reliability needs.

The stakeholder process resulted in a decision to issue post-day-ahead market exceptional dispatch energy schedules to such resources if needed for reliability. The CAISO concluded, however, that using the existing real-time exceptional dispatch settlement rules to settle such energy schedules would allow a resource receiving such an energy schedule to exercise market power because such a resource knows it is needed for reliability. Thus, it can submit a higher bid in the real-time market for the hours of the energy schedule and ensure settlement at a bid price that is at or near the bid cap. As discussed below, to remedy this situation, the CAISO will settle resources receiving post-day-ahead exceptional dispatch energy schedules under the same settlement rule but will use the resource’s day-ahead bid instead of its real-time bid. This

---

<sup>1</sup> The CAISO submits this filing pursuant to section 205 of the Federal Power Act (FPA), 16 U.S.C. § 824d. References to tariff section numbers in this filing mean references to specified sections of the CAISO tariff.

will eliminate a resource's ability to benefit financially by submitting a higher bid in the real-time market after it knows it is needed for reliability.

No stakeholder opposed the proposed revision to the exceptional dispatch settlement rules. The CAISO requests that the Commission accept this tariff amendment effective November 18, 2020, *i.e.*, 61 days from the date of this filing.

## **I. Slow Demand Response and Exceptional Dispatch Settlement Rules**

### **A. Background**

One of the CAISO's primary objectives this year is to operationalize slow demand response resources to meet local capacity requirements.<sup>2</sup> As discussed in more detail below, these resources participate in California's resource adequacy program but have limiting characteristics that challenge their usefulness as local capacity area resources based on how quickly and effectively the CAISO can use them to address contingencies.<sup>3</sup>

On an annual basis, the CAISO conducts a local capacity technical study to determine the minimum amount of local capacity area resources that are needed in each local capacity area to address contingencies in accordance with North American Electric Reliability Corporation (NERC), Western Electricity Coordinating Council (WECC) and CAISO planning standards.<sup>4</sup> Specifically, the CAISO must have sufficient local capacity area resources to enable it to manually readjust the system within 30 minutes following a first contingency to prepare the system for a potential second contingency.<sup>5</sup>

In order to qualify as a local capacity area resource, a resource must be physically capable of contributing to the resolution of contingencies identified in the study within this 30-minute time frame. Resources can provide this capability by either (1) being able to respond with sufficient speed to CAISO dispatch instructions after the first contingency occurs to allow the CAISO operator the necessary time to assess and re-dispatch resources to effectively reposition the system within 30 minutes, or (2) having sufficient energy available for frequent

---

<sup>2</sup> See CAISO 2020 Three-Year Policy Initiatives Roadmap and Annual Plan at slide 12 (Jan. 23, 2020), available at <http://www.caiso.com/Documents/2020FinalPolicyInitiativesRoadmap.pdf>.

<sup>3</sup> Resources participating in the resource adequacy program that are physically capable of operating are required to submit day-ahead bids for their resource adequacy capacity. See tariff sections 40.6.1 and 40.6.1.1.

<sup>4</sup> See tariff section 40.3.

<sup>5</sup> See tariff sections 40.3.1.1 and 40.3.1.1(1).

dispatch on a pre-contingency basis to ensure the operator can meet minimum online commitment constraints or reposition the system within 30 minutes after the first contingency occurs.<sup>6</sup>

Demand response resources can help support system reliability in local areas by reducing load, thus requiring less electricity supply when the local area is supply-constrained. However, certain demand response resources have limiting characteristics that can hinder their usefulness as local capacity resources based on how quickly and effectively the CAISO can use them to address contingencies. Specifically, these slow demand response resources cannot “start” like a generator and be ready or pre-positioned to respond to a CAISO dispatch instruction within 20 minutes so the CAISO can reposition the system within 30 minutes of a contingency occurring. Although many demand response resources can quickly reduce load at a scheduled time, slow demand response resource operators require longer lead times to know specifically when to reduce load. Thus, slow demand response resources require significant additional notification time, relative to other resources, before they can respond to a CAISO dispatch instruction.<sup>7</sup>

The CAISO held workshops with interested parties that focused on developing creative solutions to allow slower-responding demand response resources to count toward local capacity requirements by enabling the CAISO to use these resources on a pre-contingency basis, rather than relying exclusively on resources capable of faster response after a first contingency has already occurred. The result of these workshops was to introduce a practice to issue exceptional dispatch energy schedules to slow demand response resources after the day-ahead market results are available,<sup>8</sup> if such resources (not already

---

<sup>6</sup> The CAISO must dispatch resources to return the system to an N-1 secure state within 30 minutes to minimize the risk the next contingency poses on the reliability of the system. This response time accounts for a minimal amount of time the CAISO operators have to perform their real-time assessment and react to the contingency condition. After the contingency and real-time assessment occurs, the CAISO has approximately 20 minutes for resources to provide generation or to reduce load within the overall 30-minute time frame to reposition the system.

<sup>7</sup> The CAISO’s market system issues instructions to each resource to operate at specific operating levels every five minutes. Resource operators must increase or decrease their resources’ output to match these five-minute instructions. Once started and online, conventional resources are prepared and ready to follow five-minute dispatches issued by the CAISO. However, some demand response resource operators require longer notification times before they can reduce load, and their demand response resources may be unable to follow varying five-minute dispatch instructions. To address this need, the CAISO introduced block scheduling options in the Energy Storage and Distributed Energy Resources Phase 3 (ESDER 3) initiative to provide longer notification times and extended real-time dispatch intervals.

<sup>8</sup> Under section 34.11 of its tariff, the CAISO may issue exceptional dispatches (*i.e.*, manual dispatches by CAISO operators outside of the CAISO’s automated dispatch process) to resources to address reliability issues.

awarded in the day-ahead market) are necessary to address a contingency that could be met with either a thermal resource or by demand response resources not consuming energy in the local capacity area.<sup>9</sup> This allows the CAISO to provide sufficient notification so these resources can be ready to address a possible contingency before it occurs.

Initially the CAISO believed no tariff changes were necessary to operationalize slow PDRs, because under its existing practice, the CAISO already issues exceptional dispatches in the post-day-ahead time frame to other types of resources (e.g., long-start thermal units), prior to the next operating day, in order to address potential contingencies that might arise in real-time.<sup>10</sup> Specifically, the CAISO issues exceptional dispatch *commitments* by which the CAISO instructs a resource to start-up and synchronize to its commitment cost (i.e., start-up cost and minimum load cost)<sup>11</sup> bid level by a certain time in the operating day. With a timely exceptional dispatch commitment instruction, the thermal resource can start-up in time to be available in the market at minimum load and then be dispatched in the market based on market bids or incremental exceptional dispatches in the real-time, if needed.

The CAISO settles these exceptional dispatch commitments as follows. The CAISO settles commitment costs resulting from the post-day-ahead exceptional dispatch commitment through the CAISO's bid cost recovery mechanism. Unless real-time exceptional dispatches for incremental energy occur, there is no exceptional dispatch energy settlement associated with the post-day-ahead exceptional dispatch commitment. If such real-time exceptional dispatches occur, the CAISO settles them at the maximum of: (a) the fifteen minute market (FMM) or real-time dispatch (RTD)<sup>12</sup> locational marginal price

---

<sup>9</sup> The CAISO will develop a computer software tool to help it better identify the need for such exceptional dispatches. See memorandum to the CAISO Governing Board from Mark Rothleder, Vice President, Market Policy and Performance, at 1-4 (July 15, 2020) (PDR Board Memorandum), which is provided in attachment D to this filing.

<sup>10</sup> The day-ahead market processes include the clearing of the market, which occurs in the integrated forward market (IFM), followed by a residual unit commitment (RUC) process. See tariff sections 31.3 and 31.5. The CAISO can issue exceptional dispatches at any time. See, e.g., *Cal. Indep. Sys. Operator Corp.*, 121 FERC ¶ 61,030, at P 40 (2007) (explaining that the CAISO has the "ability to issue exceptional dispatches prior to the real-time market"); *Cal. Indep. Sys. Operator Corp.*, 128 FERC ¶ 61,218, at P 25 (2009) (describing day-ahead and real-time exceptional dispatches). However, the two most frequent time frames for issuing exceptional dispatches are (1) in the real-time market and (2) following the close of the day-ahead market, when the CAISO commits long-start resources needed for reliability that were not committed in the day-ahead market.

<sup>11</sup> For multi-stage generating (MSG) resources, commitment costs also include the costs of transitioning from one MSG configuration to a higher MSG configuration.

<sup>12</sup> The FMM and RTD are part of the market processes for the real-time market.

(LMP); (b) the energy bid price; (c) the default energy bid price if the resource has been mitigated and for energy that does not have an energy bid price; or (d) the negotiated price as applicable to system resources (*i.e.*, resources located outside of the CAISO balancing authority area).<sup>13</sup>

With respect to issuing post-day-ahead exceptional dispatches to slow PDRs, the CAISO recognized it would need to modify its current practice and instead of simply issuing commitment instructions to such resources, it will issue actual energy schedules in the post-day-ahead time frame – *i.e.*, a megawatt-hour (MWh) amount as well as a start and end time. This is the case for two reasons. First, unlike long-start thermal units, demand response resources generally either do not have any commitment costs, or have commitment costs set at zero. A long-start thermal resource, in contrast, has commitment costs. Further, slow demand response resources are not dispatchable in the real-time within the timeframe required in the NERC reliability standards and CAISO reliability criteria. If the CAISO were to issue a commitment instruction with no other information to a slow PDR, the instruction would not result in the resource being available and dispatchable in the real-time market. Therefore, slow PDRs require an energy schedule in the post-day-ahead time frame to provide the curtailed energy over the critical time period at the necessary level in the real-time.

Although the existing tariff allows the CAISO to issue exceptional dispatch energy schedules in the post-day-ahead time frame, in developing this solution, the CAISO recognized there is a tariff gap regarding the manner in which it settles exceptional dispatch schedules issued in this time frame. As noted above, the existing tariff provides that the exceptional energy price per MWh is based in part on a resource's FMM or RTD energy bid price. Moreover, any resource, including a PDR, that receives an exceptional dispatch schedule in this post day-ahead time frame would be able to inflate its bid prices, bidding at or near the bid cap which is currently \$1,000/MWh.<sup>14</sup> This situation provides a clear and obvious opportunity for the resource to exercise market power and obtain the highest compensation possible. In contrast, when the CAISO commits a thermal resource, for example, in the post-day-ahead time frame, the resource is obligated to turn on and operate at minimum load. The resource will then submit bids into the real-time market and those bids will be subject to local market power

---

<sup>13</sup> Tariff section 11.5.6.2.4. There are several categories of exceptional dispatch, depending on the reliability reason. Tariff section 34.11, *et seq.* All of these categories are subject to the same general settlement rules for how to compensate the resources using the same formula, but the cost allocation differs. Tariff section 11.5.6, *et seq.* In addition, if the mitigated dispatch energy settlement rules apply, there is an alternate settlement rule based on criteria set forth in tariff section 39.10.

<sup>14</sup> The bid cap is set forth in tariff section 39.6.1.1.

mitigation.<sup>15</sup> If the CAISO must nevertheless issue a real-time exceptional dispatch to the resource, the resource's real-time bids will already have been submitted. Accordingly, the exceptional dispatch commitment practice does not create the opportunity to exercise market power. As discussed below, the CAISO proposes to address this issue by substituting the day-ahead bid price for the real-time bid price in item (b) of the settlement formula described above.

## **B. Stakeholder Processes Preceding this Tariff Amendment**

The CAISO and stakeholders developed the approach for operationalizing slow PDRs and the proposed tariff change described in this filing during the Resource Adequacy Enhancements stakeholder initiative, which began in October 2018.<sup>16</sup> After the CAISO identified the need for a tariff change to address the settlement of post-day-ahead market exceptional dispatches involving an energy schedule, it split off that tariff revision issue and moved it to a new stakeholder initiative called Proxy Demand Resource – Resource Adequacy Clarifications.<sup>17</sup>

On April 21, 2020, the CAISO issued a paper that included the proposed tariff revision.<sup>18</sup> On April 28, the CAISO held a stakeholder conference call to discuss the paper and requested that stakeholders submit written comments by May 8. The CAISO posted draft tariff language to implement the revision on June 10, requested that stakeholders submit written comments on the draft tariff language by June 16, and held a stakeholder conference call to discuss the tariff language on June 22. All comments received supported this tariff amendment.

The CAISO Board voted unanimously to authorize this filing at its public meeting held on July 22, 2020.<sup>19</sup>

---

<sup>15</sup> See tariff section 39.7.

<sup>16</sup> Materials related to that stakeholder initiative are available at <http://www.caiso.com/StakeholderProcesses/Resource-Adequacy-Enhancements>.

<sup>17</sup> Materials related to this stakeholder initiative are available at <http://www.caiso.com/StakeholderProcesses/Proxy-demand-resource-resource-adequacy-clarification>. The stakeholder initiative also addressed proposed tariff revisions to clarify how effective flexible capacity (EFC) values are set for PDRs. However, the instant tariff amendment does not contain any tariff revisions on that topic, which will be addressed in a separate tariff amendment.

<sup>18</sup> This paper, which is entitled *Effective Flexible Capacity Value for Proxy Demand Resources – Tariff Clarifications; Slow Demand Response – Final Proposal* (PDR Final Proposal), is provided in attachment C to this filing.

<sup>19</sup> Materials related to the Board's authorization are available at <http://www.caiso.com/informed/Pages/BoardCommittees/Default.aspx>.

## II. Proposed Tariff Revision

The only tariff revision proposed in this filing addresses the settlement of post-day-ahead exceptional dispatch energy schedules, which will apply to slow PDRs and all other types of resources that receive such schedules.<sup>20</sup> Specifically, the CAISO proposes to augment the tariff provisions on the settlement of exceptional dispatches for non-transmission-related modeling limitations<sup>21</sup> to add a new rule stating that for resources receiving an exceptional dispatch energy instruction prior to the operating day, the exceptional dispatch settlement price will be the maximum of: (a) the applicable FMM or RTD LMP; (b) the IFM energy bid price; or (c) the default energy bid price if the resource has been mitigated in the day-ahead market and for energy that does not have an IFM energy bid price.<sup>22</sup> The CAISO is retaining the existing settlement rule applicable to all other exceptional dispatches for non-transmission-related modeling limitations, which do not involve resources that receive exceptional dispatch energy instructions prior to the operating day.

This new pricing rule for post-day-ahead exceptional dispatch energy schedules differs from the existing pricing mechanism described above in two respects. First, item (b) under the new pricing mechanism is the IFM (*i.e.*, day-ahead) energy bid price, instead of the real-time market energy bid price per the existing tariff rule.<sup>23</sup> This modification ensures resources that are exceptionally dispatched prior to the operating day cannot exercise market power by bidding in the real-time at the \$1,000/MWh energy bid cap (or increasing their existing real-time bids to the cap). Second, the new pricing mechanism for exceptional

---

<sup>20</sup> In addition to implementing the plan described above for post-day-ahead market exceptional dispatch of demand response resources, the CAISO may want to issue exceptional dispatch energy schedules in that same time frame to other types of resources for different reasons. For example, when natural gas constraints are expected to arise in the real-time market, the CAISO may want to issue exceptional dispatch energy schedules to resources to permit them to obtain gas prior to the real-time. The CAISO explained in the stakeholder process that the new pricing mechanism would apply to all resources (including but not limited to demand response resources). See <http://www.caiso.com/InitiativeDocuments/StakeholderCommentsMatrix-SlowDemandResponse-DraftTariffLanguage.pdf>.

<sup>21</sup> Under its tariff, the CAISO can issue exceptional dispatches to address transmission-related modeling limitations and non-transmission-related modeling limitations (*i.e.*, system reliability and other specified issues). Tariff sections 34.11 – 34.11.3. The post-day-ahead exceptional dispatch for reliability purposes described in this filing does not concern transmission-related modeling limitations.

<sup>22</sup> Revised tariff section 11.5.6.2.4.

<sup>23</sup> Similarly, item (c) under the new pricing mechanism references energy that does not have an IFM energy bid price, rather than energy that does not have an energy bid price as under the existing pricing mechanism.

dispatch energy schedules does not include item (d) (*i.e.*, the negotiated price as applicable to a system resource) because, under its tariff, the CAISO can only issue real-time exceptional dispatch instructions to system resources, not post-day-ahead exceptional dispatches.<sup>24</sup> The CAISO only issues post-day-ahead exceptional dispatches to specific resources that have agreements with the CAISO. System resources, in contrast, are not tied to a specific resource unless they have a resource-specific system resource agreement.<sup>25</sup> The CAISO can arrange real-time transactions with system resources at a negotiated price.

In conclusion, the proposed tariff revision is necessary and appropriate to provide for the settlement of post-day-ahead exceptional dispatch energy schedules, including but not limited to such schedules issued to PDRs that are operationalized to meet local reliability needs. The tariff revision will also prevent resources that are exceptionally dispatched with an energy schedule prior to the operating day from exercising market power by bidding at the cap in the real-time because they know they are needed for reliability during that time period. The only feedback the CAISO received from stakeholders was a request from one stakeholder that the CAISO explain the rationale for the tariff revision, which the CAISO did in a written response.<sup>26</sup> No stakeholder opposed the proposed tariff revision.

### **III. Effective Date**

The CAISO requests that the Commission accept this tariff amendment effective November 18, 2020, *i.e.*, 61 days from the date of this filing.

---

<sup>24</sup> See tariff section 34.11.1.

<sup>25</sup> See tariff section 4.12, *et seq.*

<sup>26</sup> See <http://www.caiso.com/InitiativeDocuments/StakeholderCommentsMatrix-SlowDemandResponse-DraftTariffLanguage.pdf>.

#### **IV. Communications**

Pursuant to Rule 203(b)(3) of the Commission's Rules of Practice and Procedure,<sup>27</sup> the CAISO requests that all correspondence, pleadings, and other communications concerning this filing be served upon:

Roger E. Collanton  
General Counsel  
Anthony Ivancovich  
Deputy General Counsel  
Sidney L. Mannheim  
Assistant General Counsel  
California Independent System  
Operator Corporation  
250 Outcropping Way  
Folsom, CA 95630  
Tel: (916) 351-4400  
Fax: (916) 608-7222  
smannheim@caiso.com

Michael Kunselman  
Bradley R. Miliauskas  
Davis Wright Tremaine LLP  
1301 K Street, NW  
Suite 500 East  
Washington, DC 20005  
Tel: (202) 973-4200  
Fax: (202) 973-4499  
michaelkunselman@dwt.com  
bradleymiliauskas@dwt.com

#### **V. Service**

The CAISO has served copies of this filing on the California Public Utilities Commission, 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.

#### **VI. Contents of Filing**

Besides this transmittal letter, this filing includes the following attachments:

- Attachment A Clean CAISO tariff sheet incorporating this tariff amendment
- Attachment B Red-lined document showing the revision in this tariff amendment
- Attachment C PDR Final Proposal proposing new exceptional dispatch settlement rule
- Attachment D PDR Board Memorandum proposing new exceptional dispatch settlement rule

---

<sup>27</sup> 18 C.F.R. § 385.203(b)(3).

**VII. Conclusion**

For the reasons explained above, the CAISO requests that the Commission accept the tariff changes proposed in this filing effective November 18, 2020.

Respectfully submitted,

Roger E. Collanton  
General Counsel  
Anthony Ivancovich  
Deputy General Counsel  
Sidney L. Mannheim  
Assistant General Counsel  
California Independent System  
Operator Corporation  
250 Outcropping Way  
Folsom, CA 95630

Michael Kunselman  
Bradley R. Miliauskas  
Davis Wright Tremaine LLP  
1301 K Street, NW  
Suite 500 East  
Washington, DC 20005

Counsel for the California Independent System Operator Corporation

**Attachment A – Clean Tariff**

**Tariff Amendment to Add Settlement Rules for Post-Day-Ahead Exceptional Dispatch**

**Energy Schedules**

**California Independent System Operator Corporation**

**September 18, 2020**

#### **11.5.6.2.4 Exceptional Dispatches for Non-Transmission-Related Modeling Limitations**

The Exceptional Dispatch Settlement price for incremental FMM Instructed Imbalance Energy or RTD Instructed Imbalance Energy that is consumed or delivered as a result of an Exceptional Dispatch to mitigate or resolve Congestion that is not a result of a transmission-related modeling limitation in the FNM as described in Section 34.11.3 is the maximum of the (a) FMM or RTD LMP; (b) Energy Bid price; (c) the Default Energy Bid price if the resource has been mitigated through the MPM in the Real-Time Market and for the Energy that does not have an Energy Bid price; or (d) the negotiated price as applicable to System Resources. For RMR Resources, the Exceptional Dispatch Settlement price for incremental FMM Instructed Imbalance Energy or RTD Instructed Imbalance Energy as a result of an Exceptional Dispatch to mitigate or resolve Congestion that is not a result of a transmission-related modeling limitation in the FNM as described in Section 34.11.3 is the maximum of: (a) FMM or RTD LMP; (b) Energy Bid price adjusted to remove Opportunity Costs; or (c) the Default Energy Bid price adjusted to remove Opportunity Costs. For resources that receive an Exceptional Dispatch energy instruction prior to the Operating Day, the Exceptional Dispatch Settlement price is the maximum of the (a) applicable FMM or RTD LMP; (b) IFM Energy Bid price; or (c) the Default Energy Bid price if the resource has been mitigated through the MPM in the Day-Ahead Market and for the Energy that does not have a IFM Energy Bid price.

All costs for incremental Energy for this type of Exceptional Dispatch will be included in the total FMM IIE Settlement Amount or RTD IIE Settlement Amount described in Sections 11.5.1.1 and 11.5.1.2.

The Exceptional Dispatch Settlement price for decremental FMM Instructed Imbalance Energy or RTD Instructed Imbalance Energy for this type of Exceptional Dispatch is the minimum of the (a) FMM or RTD LMP; (b) Energy Bid Price; (c) Default Energy Bid price if the resource has been mitigated through the MPM in the Real-Time Market and for the Energy that does not have an Energy Bid price; or (d) negotiated price as applicable to System Resources. For RMR Resources; the Exceptional Dispatch Settlement for decremental FMM Instructed Imbalance Energy or RTD Instructed Imbalance Energy for this type of Exceptional Dispatch is the minimum of the: (a) FMM or RTD LMP; (b) Energy Bid price adjusted to remove Opportunity Costs; or (c) Default Energy Bid price adjusted to remove Opportunity Costs. All costs for decremental FMM Instructed Imbalance Energy or RTD Instructed Imbalance Energy

associated with this type of Exceptional Dispatch are included in the total FMM IIE Settlement Amount or RTD IIE Settlement Amount described in Sections 11.5.1.1 and 11.5.1.2.

**Attachment B – Marked Tariff**

**Tariff Amendment to Add Settlement Rules for Post-Day-Ahead Exceptional Dispatch**

**Energy Schedules**

**California Independent System Operator Corporation**

**September 18, 2020**

#### 11.5.6.2.4 Exceptional Dispatches for Non-Transmission-Related Modeling Limitations

The Exceptional Dispatch Settlement price for incremental FMM Instructed Imbalance Energy or RTD Instructed Imbalance Energy that is consumed or delivered as a result of an Exceptional Dispatch to mitigate or resolve Congestion that is not a result of a transmission-related modeling limitation in the FNM as described in Section 34.11.3 is the maximum of the (a) FMM or RTD LMP; (b) Energy Bid price; (c) the Default Energy Bid price if the resource has been mitigated through the MPM in the Real-Time Market and for the Energy that does not have an Energy Bid price; or (d) the negotiated price as applicable to System Resources. For RMR Resources, the Exceptional Dispatch Settlement price for incremental FMM Instructed Imbalance Energy or RTD Instructed Imbalance Energy as a result of an Exceptional Dispatch to mitigate or resolve Congestion that is not a result of a transmission-related modeling limitation in the FNM as described in Section 34.11.3 is the maximum of: (a) FMM or RTD LMP; (b) Energy Bid price adjusted to remove Opportunity Costs; or (c) the Default Energy Bid price adjusted to remove Opportunity Costs. For resources that receive an Exceptional Dispatch energy instruction prior to the Operating Day, the Exceptional Dispatch Settlement price is the maximum of the (a) applicable FMM or RTD LMP; (b) IFM Energy Bid price; or (c) the Default Energy Bid price if the resource has been mitigated through the MPM in the Day-Ahead Market and for the Energy that does not have a IFM Energy Bid price.

All costs for incremental Energy for this type of Exceptional Dispatch will be included in the total FMM IIE Settlement Amount or RTD IIE Settlement Amount described in Sections 11.5.1.1 and 11.5.1.2.

The Exceptional Dispatch Settlement price for decremental FMM Instructed Imbalance Energy or RTD Instructed Imbalance Energy for this type of Exceptional Dispatch is the minimum of the (a) FMM or RTD LMP; (b) Energy Bid Price; (c) Default Energy Bid price if the resource has been mitigated through the MPM in the Real-Time Market and for the Energy that does not have an Energy Bid price; or (d) negotiated price as applicable to System Resources. For RMR Resources; the Exceptional Dispatch Settlement for decremental FMM Instructed Imbalance Energy or RTD Instructed Imbalance Energy for this type of Exceptional Dispatch is the minimum of the: (a) FMM or RTD LMP; (b) Energy Bid price adjusted to remove Opportunity Costs; or (c) Default Energy Bid price adjusted to remove Opportunity Costs. All costs for decremental FMM Instructed Imbalance Energy or RTD Instructed Imbalance Energy

associated with this type of Exceptional Dispatch are included in the total FMM IIE Settlement Amount or RTD IIE Settlement Amount described in Sections 11.5.1.1 and 11.5.1.2.

**Attachment C – PDR Final Proposal proposing new Exceptional Dispatch rule**  
**Tariff Amendment to Add Settlement Rules for Post-Day-Ahead Exceptional Dispatch**  
**Energy Schedules**  
**California Independent System Operator Corporation**  
**September 18, 2020**



California ISO

## **Proxy Demand Resource – Resource Adequacy Clarifications**

- Effective Flexible Capacity Value for Proxy Demand Resources – Tariff Clarifications
- Slow Demand Response – Final Proposal

**April 21, 2020**

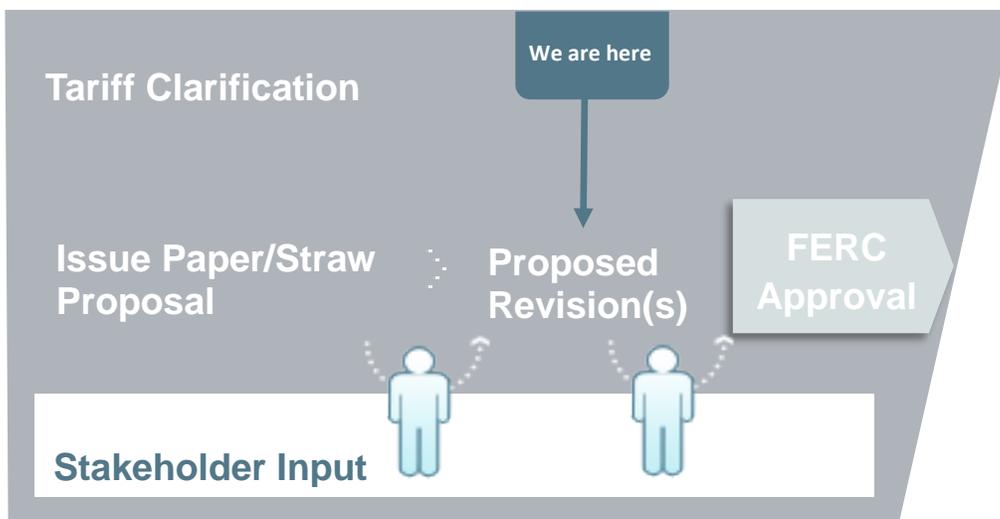
**Market & Infrastructure Policy**

## Stakeholder Process

This initiative considers two changes to existing tariff rules for proxy demand resources (PDRs): (1) clarifications on setting the effective flexible capacity (EFC) value for PDRs; and (2) rule changes on participation of “slow” demand response resources that require longer-than-normal notification times.

The CAISO has determined that the PDR EFC part of this initiative is consistent with prior board-approved policy from the flexible capacity resource adequacy must-offer obligation (FRACMOO) initiative,<sup>1</sup> and, therefore, does not require board approval of proposed tariff changes. This paper serves as a notification to stakeholders of these clarifications. Proposed tariff clarifications will require FERC filing and approval, as is the case for all tariff revisions.

**Figure 1: Effective Flexible Capacity Value for PDRs Initiative Stakeholder Engagement**



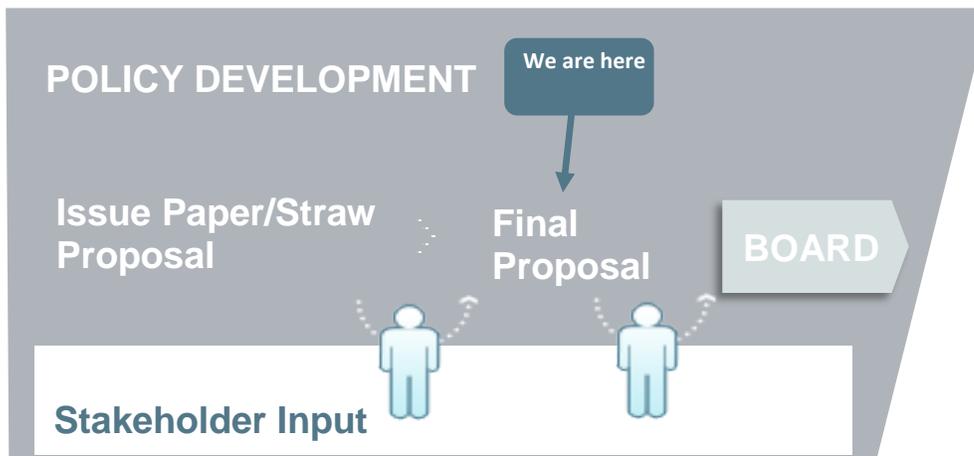
The CAISO is at the final proposal stage in the Slow Demand Response (DR) stakeholder initiative process, having determined that the slow

<sup>1</sup> Decision on flexible resource adequacy criteria and must-offer obligation, Board Memorandum <http://www.caiso.com/Documents/Decision-FlexibleResourceAdequacyCriteriaMustOfferObligation-Memo-Mar2014.pdf>

demand response draft final proposal will require tariff clarifications needing CAISO Board approval.

The purpose of a final proposal is to present policy, in final form, to be ultimately adopted. The final proposal is inclusive of revisions resulting from CAISOs impact assessment and business requirements development of policy proposed in the Slow DR draft final proposal. This stakeholder process will include a window for feedback on the tariff clarification needed to implement the Slow Demand Response final proposal policy only. Figure 2 below shows the status of the publication of this paper within the accelerated stakeholder engagement process for policy development.

Slow demand response was largely stakeholdered within the RA Enhancements initiative.<sup>2</sup> During project development of the slow demand response requirements, the CAISO determined that tariff clarifications were needed regarding the settlement of slow DR, as described in more detail in the Slow DR final proposal section of this paper below. This includes a description of the settlement of slow demand response when, as proposed, it is exceptionally dispatched in the post-day ahead market, pre-contingency process described in the RA Enhancements initiative.



**Figure 2: Proxy Demand Resource - Resource Adequacy Clarification Initiative Stakeholder Engagement**

<sup>2</sup> RA Enhancements Stakeholder Initiative Webpage:  
<http://www.caiso.com/StakeholderProcesses/Resource-adequacy-enhancements>

## Process for Approval – Decisional Classification

For this initiative, the ISO is not seeking policy approval from the Board of Governors on the proposed effective flexible capacity value for proxy demand resource tariff clarifications. The proposed tariff change is for an implementation process change that has been determined to be within the flexible resource adequacy capacity must offer obligation (FRACMOO) policy proposal approved by the board on March 20, 2014.<sup>3</sup> Therefore there is also no role for the Energy Imbalance Market (“EIM”) Governing Body.

For the slow demand response initiative, the CAISO plans to seek approval of the proposed tariff changes from the CAISO Board only. We believe this initiative falls outside the scope of the EIM Governing Body’s advisory role because the initiative does not propose changes to either real-time market rules or rules that govern all CAISO markets. Rather, this initiative proposes changes to the tariff that would affect resources only in the CAISO balancing authority area. Specifically, the initiative would change how the CAISO pre-contingency dispatches slow demand response resources providing local resource adequacy capacity, with the aim of clarifying these for demand response participants. This applies only to proxy demand resources providing resource adequacy, specifically local area capacity, to load serving entities (LSEs) serving load in CAISO’s Balancing Area Authority (BAA) as a supply side resource procured to serve that load. It does not apply to LSEs outside CAISO’s BAA. The CAISO welcomes stakeholder comments on this proposed decisional classification for the Slow DR initiative.

---

<sup>3</sup> General session minutes, ISO Board of Governors meeting, decision on FRACMOO  
[http://www.caiso.com/Documents/FinalBoardGovernorsGeneralSessionMinutesMar19\\_2014.pdf](http://www.caiso.com/Documents/FinalBoardGovernorsGeneralSessionMinutesMar19_2014.pdf)

# Effective Flexible Capacity Value for Proxy Demand Resources – Tariff Clarifications

## Introduction

The CAISO began the Effective Flexible Capacity Value for PDRs initiative on March 27, 2020 with the issuance of a combined issue Paper/straw proposal that include four proposal elements: 1) changes to the current tariff requirements as to how the CAISO sets PDR effective flexible capacity values for proxy demand resources, 2) leveraging existing tariff provisions to perform unannounced testing of PDRs providing flexible RA capacity, 3) clarify that PDRs qualify for the provision of flexible resource adequacy only when they choose the 5-minute bidding option, and 4) reviewing need to include clarifications within appropriate business practice manual(s) to clearly identify how PDRs providing flexible RA meet their must offer obligation.

After publication of the issue paper/straw proposal, the CAISO hosted an April 3, 2020 conference call to review the paper, and received written comments regarding the initiative proposals presented. This paper includes a summary of stakeholder comment review of proposed initiative elements, with an affirmed conclusion that the current methodology for setting the EFC capacity value for proxy demand resources requiring a random test to establish this value should change. This change would recognize continued use of the general formula currently being effectively used in establishing these values by removing tariff subsection 40.10.4.1 (c) and amending section 40.10.4.1 to reflect the continuation of calculating PDR EFCs using 40.10.4.1(a) tariff provisions. The CAISO believes this is the appropriate methodology, having demonstrated it as an administrable and reasonable alternative for setting EFC values for PDRs along with nearly all other resource types. The CAISO has also considered this as an alternative that will have minimal overall impact on the flexible resource adequacy program.

## Background

In 2019, the CAISO identified a gap in its implementation of section 40.10.4.1 regarding PDRs. Section 40.10, which includes the CAISO tariff provisions covering flexible resource adequacy capacity, became effective

in November 2014 as part of the CAISO's Flexible Resource Adequacy Criteria and Must Offer Obligations (FRACMOO) initiative.<sup>4</sup> The FRACMOO tariff provisions include a requirement, under Section 40.10.4.1(c), for the CAISO to conduct random tests to set a PDR's effective flexible capacity based on its performance to that test.<sup>5</sup>

When the CAISO implemented FRACMOO in 2014, there were no PDRs registered and actively participating in the CAISO markets. In the absence of any PDRs with a flexible RA obligation, the CAISO did not develop the test procedures called for under section 40.10.4.1(c). The CAISO had still not developed a test procedure when the first PDRs came into the CAISO system under a resource adequacy must offer obligation.

The CAISO petitioned for and received a limited tariff waiver of section 40.10.4.1 allowing the CAISO to continue calculating the EFC values for PDRs based on the general formula instead of the random testing and performance evaluation requirement contemplated under subsection (c). Section 40.10.4.1(a) provides a general formula for setting EFC values. The formula accounts for a resource's start-up time, ramp rate, and net qualifying capacity.

The CAISO performed an impact assessment of the processes and systems needed to implement an effective random testing and performance evaluation for use in a test-based calculated EFC for PDRs as contemplated in section 40.10.4.1. The CAISO determined these changes would require costly system enhancements.

On December 31, 2019, the CAISO petitioned for an extension of the May 31, 2019 limited waiver request granted by the Commission to continue its assessment of whether to apply random tests for assessing PDR's effective flexible capacity. The CAISO requested the waiver to allow the

---

<sup>4</sup> *Cal. Indep. Sys. Operator Corp.*, 149 FERC ¶ 61,042 (2014); *Cal. Indep. Sys. Operator Corp.*, Transmittal Letter, FERC Docket No. ER14-2574 (Aug. 1, 2014) (FRACMOO Filing). [http://www.caiso.com/Documents/Aug1\\_2014\\_TariffAmendment-FlexibleResourceAdequacyCapacityRequirement\\_ER14-2574-000.pdf](http://www.caiso.com/Documents/Aug1_2014_TariffAmendment-FlexibleResourceAdequacyCapacityRequirement_ER14-2574-000.pdf)

<sup>5</sup> *Cal. Indep. Sys. Operator Corp.*, Fifth Replacement Electronic Tariff section 40.10.4.1 subsection (c) <http://www.caiso.com/Documents/Section40-ResourceAdequacyDemonstration-SCs-CAISOBAAsof-Dec31-2019.pdf>

CAISO to take the time afforded by this extension to “confer with stakeholders to explore potential alternatives and any appropriate tariff amendments.”<sup>6</sup> The Commission granted this second waiver on February 28, 2020, extending the previous limited tariff waiver through August 1, 2020.

## Stakeholder Comments on EFC Value for PDR Issue Paper/Draft Straw Proposal

Stakeholder comments generally support the removal of the requirement to conduct tests to establish the EFC for each Proxy Demand Resource (PDR) with continuation of calculating it using the general formula under CAISO’s tariff section 40.10.4.1. Additionally these comments support and recognize the reasonableness of the proposals retention of testing at the CAISOs discretion, with suggestion that there be clarification as to when testing might be warranted.

Stakeholders also supported the clarification of the 5-minute dispatch requirement and MOO for PDRs providing flexible RA. Comments included input as to additional clarification needed and suggestion that they be included in the Business Practice Manual for Demand Response.

## EFC Value for PDR Proposed Clarifications

The CAISO’s proposes changes to the following elements of a proxy demand resources provision of flexible resource adequacy capacity:

### **Setting of effective flexible capacity (EFC) values**

The CAISO proposes to remove the text of subsection 40.10.4.1(c). This is the tariff language that establishes the existing test-based EFC for PDRs. With this text removed, PDR EFCs would be set using the default approach outlined in subsection 40.10.4.1(a). This default approach applies to resources that do not have an alternative methodology outlined in the tariff.

The CAISO continues to believe performing the tests required under tariff subsection 40.10.4.1(c) would be difficult to manage and would require

---

<sup>6</sup> *Cal. Indep. Sys. Operator Corp.*, 170 FERC ¶ 61,173 (2020) at P 5.

costly investments in system upgrades for no measurable benefit given the limited EFC supply from PDRs. In addition, PDR offers extremely limited amounts of flexible capacity in to the CAISO’s resource adequacy program. The following table reflects the amount of effective flexible capacity PDRs have provided over the last 12 months, further highlighting their minimal percentage of flexible resource adequacy contribution.

Table 1

RA Month	Flex RA from PDRs (MW)	EFC from PDRs (MW)	% of PDR EFC Shown	Total Flex RA Requirement	% of Flex RA from PDRs
May-19	35.50	1323.58	2.68%	12,983.55	0.27%
Jun-19	35.00	1968.29	1.78%	11,391.90	0.31%
Jul-19	35.00	1984.51	1.76%	10,614.09	0.33%
Aug-19	5.00	1986.46	0.25%	11,180.30	0.04%
Sep-19	5.00	1986.46	0.25%	14,272.75	0.04%
Oct-19	5.00	1986.35	0.25%	13,912.77	0.04%
Nov-19	5.00	1986.55	0.25%	14,361.57	0.03%
Dec-19	5.00	1986.55	0.25%	15,372.96	0.03%
Jan-20	0	1007.98	0.00%	18,492.98	0.00%
Feb-20	0	1009.50	0.00%	18,622.60	0.00%
Mar-20	0	1009.50	0.00%	17,702.41	0.00%
Apr-20	0	1009.60	0.00%	17,384.37	0.00%
May-20	0	1028.66	0.00%	16,444.77	0.00%

**Testing for CAISO validation of Masterfile characteristics**

Although the ISO is proposing that it no longer will set PDR EFC values based on a test, PDRs (whether providing RA capacity or not) still will be subject to existing tariff provisions that permit tests. For example, all resources providing ancillary services, including PDRs, are subject to

unannounced testing to confirm their capability to provide ancillary services.<sup>7</sup>

Additionally, the tariff requires master file information for PDRs to “be accurate and actually based on physical characteristics of the resources” and that PDRs must provide “information regarding the capacity and the operating characteristics of the . . . Proxy Demand Resource as may be reasonably requested from time to time by the CAISO.”<sup>8</sup> This provision requires PDRs to offer and provide service consistent with capabilities they’ve registered. Where a PDR’s performance does not align with its registered master file values the CAISO may request further information to validate the existing master file information.

One way a PDR may be able to justify its master file parameters (e.g., ramp rate, Pmax) in response to a CAISO inquiry is to request a self-test. The results of the PDR’s performance in the self-test would indicate if changes to the master file characteristics are warranted. Where changes are appropriate, the PDR should utilize existing resource data template change processes. It will be the responsibility of the Scheduling Coordinator to facilitate the performance of the self-test utilizing the provisions of Operating Procedure 5330, section 3.5.<sup>9</sup>

### **Five-minute bidding and dispatch requirement**

The FRACMOO revised draft final proposal identified that “Flexible capacity must be able to respond to five-minute dispatch instructions”.<sup>10</sup> In 2014, when the FRACMOO initiative was stakeholdered and tariff language filed, the CAISO modeled all PDRs as resources with an ability to respond to 5-minute dispatches. In 2019, the ESDER3 initiative

---

<sup>7</sup> CAISO Tariff section 8.9 Verification, Compliance Testing, and Auditing,  
<http://www.caiso.com/Documents/Section8-AncillaryServices-asof-Aug12-2019.pdf>

<sup>8</sup>CAISO Tariff section 4.13.3 Identification of RDRRs and PDRs,  
<http://www.caiso.com/Documents/Section4-Roles-Responsibilities-asof-Dec3-2019.pdf>

<sup>9</sup> Operating Procedure 5330 Resource Testing Guidelines,  
<http://www.caiso.com/Documents/5330.pdf>

<sup>10</sup>FRACMOO Revised Draft Final Proposal March 7, 2014, Section 6 p 36  
<http://www.caiso.com/Documents/RevisedDraftFinalProposal-FlexibleRACriteriaMustOfferObligation-Clean.pdf>

enhanced the PDR participation model providing PDRs the ability to specify in the Master File how they will bid and be dispatched in the real-time market. These bidding options allowed PDRs to be dispatched in hourly (60-minute) blocks, 15-minute intervals, or 5-minute intervals. With the November 13, 2019 implementation of ESDER3, it is now necessary to clarify that PDRs qualify for the provision of flexible resource adequacy only when they choose the 5-minute bidding option providing the CAISO with the ability to dispatch them in real-time in the five-minute market.

Tariff section 40.10.3.6 states that imports other than pseudo-ties and dynamic resources are ineligible to provide flexible RA capacity. This existing restriction reflects the initial FRACMOO policy that resources that are not five-minute dispatchable should not provide flexible RA capacity. The ISO proposes to edit this section to clarify that PDRs that are not five-minute dispatchable are similarly ineligible to provide flexible RA capacity. Specifically, the ISO propose that section 40.10.3.6 would state (additions reflected in red underline):

Intertie resources and imports, other than Pseudo-Ties and Dynamic Scheduled resources, and Proxy Demand Resources that have elected, per Section 4.13.3, to bid and be dispatched in the Real-Time Market in Hourly Blocks or fifteen (15) minute intervals are not eligible to provide Flexible RA Capacity.

### **Clarification of its must offer obligation (MOO)**

The last element of the proposal is to ensure that the appropriate business practice manuals (BPM) clearly identify that the PDR must meet the must offer obligation (MOO) required for provision of flexible RA under each of the categories for which it is qualified.<sup>11</sup> The CAISO will also add clarifications, or at minimum a reference to MOO clarification, in the BPM for DR<sup>12</sup> per request from stakeholders.

---

<sup>11</sup> BPM for Reliability, Section 7.4.3 outlines the must offer obligations for flexible capacity in accordance with ISO tariff section 40.10.6.

<https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Reliability Requirements>

<sup>12</sup> BPM for Demand Response

[https://bpmcm.caiso.com/BPM%20Document%20Library/Demand%20Response/BPM\\_for\\_Demand\\_Response\\_V3\\_clean.pdf](https://bpmcm.caiso.com/BPM%20Document%20Library/Demand%20Response/BPM_for_Demand_Response_V3_clean.pdf)

# Slow Demand Response – Final Proposal

## Introduction – Slow Demand Response

For reliable operation of the grid, CAISO depends on adequate supply from resources in local areas to meet demand. Demand response resources can help support the system in local areas by reducing load, thus requiring less electricity supply when the local area is supply constrained. Certain demand response resources have limiting characteristics that challenge their usefulness as local capacity resources and how quickly and effectively the CAISO can use them to address contingencies. Specifically, “slow” demand response cannot be “started” like a generator and be ready to respond to a CAISO dispatch instruction within 20 minutes so that the CAISO can reposition the system within 30 minutes of a contingency occurring. Slow demand response resources are unique from other resources and require additional “notification time” before they can respond to a CAISO dispatch instruction.<sup>13</sup>

While many demand response resources can quickly deliver energy in response to dispatches, slow demand response resources may require longer lead times.. CAISO and the California Public Utilities Commission (CPUC) have been working to ensure both “fast” and “slow” demand response resources are capable of meeting local reliability requirements.

For the purposes of this paper, CAISO defines slow demand response as demand response resources that cannot respond to a CAISO dispatch instruction within 20 minutes after a contingency occurs, or when the system enters an N-1 insecure state (loss of a single critical element). CAISO must dispatch resources to return the system to an N-1 secure state within 30 minutes to minimize the risk the next contingency poses on the reliability of the system. This response time accounts for a minimal amount of time the CAISO operators have to perform their real-time assessment and react to the contingency condition. After the contingency and real-time assessment occurs, CAISO is left with approximately 20

---

<sup>13</sup> Notification time refers to the time required for a resource to go from its Pmin (often zero for demand response) to responding to a dispatch instruction. This differs from startup time, which is the time period required for a resource to go from offline to its Pmin.

minutes for resources to provide generation or load drop within the overall 30-minute timeframe to reposition the system.

To meet local RA needs within this time requirement, resources must either:

- Be capable of responding quickly enough such that the CAISO can rebalance the system within 30 minutes of a contingency event, or;
- Have sufficient availability such that the resource can be dispatched frequently on a pre-contingency basis

By definition, slow demand response cannot respond quickly enough to satisfy the first option. However, CAISO planning studies have indicated, at DR penetration levels at the time of the study, existing slow demand response generally has the required availability to satisfy the second option. Therefore, the CAISO developed the post-day-ahead market, pre-contingency dispatch methodology described in the RA Enhancements initiative, to identify when to dispatch slow DR on a pre-contingency basis, such that the CAISO can use them to meet local needs while preserving their use as an energy-limited resource.<sup>14</sup>

## Background

The CAISO published a draft final proposal on the pre-contingency dispatch methodology for slow demand response within the RA Enhancements initiative.<sup>15</sup> During the project development of the post-day-ahead, pre-contingency dispatch methodology for slow demand response, the CAISO identified tariff changes related to the settlement of the exceptional dispatch of demand response resulting from the pre-contingency dispatch methodology. These changes are described in this final proposal below.

In the CAISO's draft final proposal on the pre-contingency dispatch methodology for slow demand response, the CAISO proposed to issue

---

<sup>14</sup> <http://www.aiso.com/InitiativeDocuments/DraftFinalProposal-LocalResourceAdequacy-AvailabilityLimitedResources-SlowDemandResponse.pdf>

<sup>15</sup> <http://www.aiso.com/InitiativeDocuments/DraftFinalProposal-LocalResourceAdequacy-AvailabilityLimitedResources-SlowDemandResponse.pdf>

exceptional dispatches to slow demand response after the conclusion of the day-ahead market to meet minimum online commitment shortfalls.<sup>16</sup> The final proposal further clarifies how the slow DR resources will be selected for dispatch based on their economic bids into the day ahead market to reduce load the next day to ensure the CAISO is prepared in the event of a potential contingency.

## Stakeholder Comments on Slow DR Proposal

Stakeholders continue to be supportive of the CAISO's efforts to integrate "slow" DR as a local capacity resource. Additionally, some commenters were supportive of the CAISO's proposal to require the Investor Owned Utility DR resources be included in their respective supply plans. Other stakeholders, in opposition to these local RA resources to being on a supply plan, maintain that the slow DR resources are available for dispatch through the markets and should not be subject to this additional requirement.

In response to these comments, the CAISO reiterates its previous statements that in order for the CAISO to have visibility into which DR resource IDs are resource adequacy and available for the CAISO to be exceptionally dispatched through its proposed methodology, they must be shown on supply plans. CAISO systems use the supply plans to identify specific resource IDs with resource adequacy capacity. Other methods of showing demand response to the CAISO, as SCE suggests, do not replace the need for demand response to be tracked in the CAISO systems as resource adequacy resources. This is the existing process for all other resource adequacy resources shown to the CAISO. Therefore, in order for this methodology to be technically feasible, resources must be shown to the CAISO on supply plans as resource adequacy capacity. The CAISO provides further discussion on why demand response should be included on supply plans within the CPUC's RA proceeding, where this issue will ultimately reach decision.<sup>17</sup>

---

<sup>16</sup> <http://www.aiso.com/InitiativeDocuments/DraftFinalProposal-LocalResourceAdequacy-AvailabilityLimitedResources-SlowDemandResponse.pdf>

<sup>17</sup> Track 2 Proposals: <http://www.aiso.com/Documents/Feb21-2020-ResourceAdequacy-Track2-Proposals-R19-11-009.pdf>, and

## Slow Demand Response Final Proposal

Because the pre-contingency dispatch methodology will dispatch slow demand response through a post-day-ahead market process that occurs after the conclusion of the day-ahead market but prior to real-time bid submission deadline, the CAISO propose to exceptional dispatches for energy given in this time frame using the day-ahead market bids instead of the real-time market bids. .

Specifically, CAISO proposes to specify that exceptional dispatches that occur as a result of the post-day ahead market process for pre-contingency dispatch will settle based on the higher of the day-ahead market bid price and the resource specific, real-time fifteen minute locational marginal price.<sup>18</sup> This is appropriate because the post-day-ahead market process will select which slow demand response to dispatch based on its day-ahead bid price and issue the exceptional dispatch prior to the operating day. Then, the resource will respond to the exceptional dispatch in real-time during the hours specified in the exceptional dispatch.

## Next Steps

In this paper, the CAISO has combined the tariff clarifications for the Effective Flexible Capacity (EFC) Value for Proxy Demand Resources (PDRs) initiative and the final proposal for the Slow Demand Response (DR) initiative.

The EFC Value for PDRs initiative seeks to reconcile the tariff and business practices for setting EFC values for PDRs. The Slow DR initiative examines how to operationalize slow DR resources that have a longer lead time for delivering energy for providing local Resource Adequacy capacity, so that they can be counted on, by the CAISO, for

---

Track 2 Reply Comments: <http://www.caiso.com/Documents/Apr2-2020-ConsolidatedReplyComments-Track2Workshops-Proposals-ResourceAdequacy-R19-11-009.pdf>

<sup>18</sup> The CAISO may also issue Exceptional Dispatch commitment during this same post day-ahead market process. Because they are commitments only, no exceptional dispatch energy is involved.

maintaining local reliability. Each of these initiatives will require CAISO tariff changes to effectuate implementation of proposals.

The CAISO began the process of informing demand response stakeholders to this combined initiative by introducing its scope at the March 1, 2020 ESDER4 workshop. After publication of the EFC Value for PDRs issue paper/straw paper on April 4<sup>th</sup>, 2020, a stakeholder conference call was completed. Proposals for both initiatives were discussed and stakeholders were given the opportunity to submit comments.

This paper will serve as the final step for stakeholder engagement in the development of EFC value for PDR tariff clarifications being made and a final proposal for Slow Demand Response that will require submission to the CAISO board for approval of resulting tariff changes proposed. The CAISO does not believe it is necessary for an extended stakeholder engagement on the initiative considering this proposal was largely stakeholdered previously, with only minor tariff clarifications added in this paper. Therefore, the CAISO is suggesting an abbreviated schedule that provided opportunity for stakeholders to submit comments to the stakeholder call on April 4<sup>th</sup>, 2020 and for this paper inclusive of the Slow Demand Response Final Proposal.

**Attachment D – PDR Board Memorandum proposing new Exceptional Dispatch  
settlement rule**

**Tariff Amendment to Add Settlement Rules for Post-Day-Ahead Exceptional Dispatch  
Energy Schedules**

**California Independent System Operator Corporation**

**September 18, 2020**



# Memorandum

**To:** ISO Board of Governors

**From:** Mark Rothleder, Vice President, Market Policy and Performance

**Date:** July 15, 2020

**Re:** **Decision on slow demand response and proxy demand resources proposal**

---

*This memorandum requires Board action.*

## EXECUTIVE SUMMARY

Pursuant to a 2016 ISO Executive Appeals Committee decision regarding a business practice manual revision and a resulting multi-year stakeholder process to fulfill the decision, Management has developed an operational solution to enable slow response proxy demand resources (PDR) located in local capacity areas to be dispatched prior to a contingency and by doing so, qualify as local capacity resource adequacy resources.

This memorandum seeks approval for tariff revisions necessary to implement the settlement of slow demand response PDRs, which will be exceptionally dispatched following the day-ahead market as a preventative measure to avoid possible overloads and NERC violations in meeting local capacity area reliability needs. Unlike other resource types<sup>1</sup> that can be committed to start up and maintain a minimum load level, slow demand response PDRs are unique and generally cannot be “started” in a timely manner and held at a minimum load level. Instead they require sufficient notification time prior to when they are needed to respond. As a result, the ISO proposes a process for evaluating needs not resolved by the day-ahead market and issuing an exceptional energy dispatch notice post day-ahead to provide sufficient dispatch notification. To operate and settle slow demand response PDRs, tariff changes are needed to clarify how the exceptional energy dispatch will be treated and settled for these resources. The following outlines the major components of the proposed slow demand response PDR solution methodology:

---

<sup>1</sup> Storage devices are also unique resources and may not have a minimum load level, but they are also not “slow responding,” which means they can respond to local capacity area contingency conditions post-contingency, and they do not have to rely on this same “preventive” exceptional energy dispatch functionality proposed here as does slow responding PDR.

1. Scheduling coordinators for load-serving entities and for demand response providers show their slow demand response PDR on their resource adequacy plans and supply plans, respectively;
2. Prior to the day-ahead market, the ISO defines constraints and reliability needs in local capacity areas;
3. The day-ahead market runs with local area constraints and reliability needs and assesses whether there are sufficient resources and import capability in a local capacity area to meet reliability requirements without using the shown local area slow demand response PDRs;
4. After the conclusion of the day-ahead market, if there is a shortfall in generation and import capability to meet local capacity area reliability needs after considering all awards and commitments in the day-ahead market (which can include PDRs that were awarded in the day-ahead market), the ISO will exceptionally dispatch any remaining uncommitted slow demand response PDR utilizing current exceptional dispatch tariff authority prior to the operating day;
5. The slow demand response PDR will settle using an exceptional dispatch energy settlement price based on the greater of the resource's day-ahead bid price or the real-time fifteen minute market locational marginal price (LMP).

Management proposes the following motion:

***Moved, that the ISO Board of Governors approves the tariff revisions necessary to implement the slow demand response and proxy demand resources proposal as described in the memorandum dated July 15, 2020; and***

***Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed deliverability methodology revisions, 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.***

## **DISCUSSION AND ANALYSIS**

For reliable operation of the grid, the ISO depends on adequate supply from resources located in local capacity areas to meet demand all hours of the year. Demand response resources can help support the system in local capacity areas by reducing load, thus requiring less electricity supply when the local area is supply constrained and would otherwise be in jeopardy should a contingency occur.

Certain demand response resources have limiting characteristics and limited availability that challenge their usefulness as local capacity resources. Additionally, they often require significant advance notice of a potential dispatch to be able to meet the local capacity area requirements so that the ISO can effectively access them to address contingencies. The ISO has defined “slow” demand response as demand response resources that cannot fully respond to an ISO dispatch instruction within 20 minutes after a contingency, or when the system enters an N-1 insecure state (loss of a single critical element) to reposition the system to a safe operating level in preparation for the next N-1 contingency event. Specifically, slow demand response cannot be “started” like a generator and be ready to respond to an ISO dispatch instruction within 20 minutes once a local area contingency occurs. Slow demand response resources are unique from other resources because they require a “notification time” before they can respond to an ISO dispatch instruction.<sup>2</sup>

NERC standards and the ISO tariff specify a maximum time of 30 minutes after a first contingency to prepare the system for a subsequent contingency. This response time accounts for the minimal amount of time the ISO operators have to perform their real-time assessment to reposition the system within safe operating limits. After a contingency strikes and a real-time assessment occurs, the ISO is left with approximately 20 minutes for resources to provide generation or load drop within the overall 30-minute timeframe. To meet local resource adequacy needs, resources must either:

1. Be capable of responding quickly enough such that the ISO can rebalance and reposition the system within 30 minutes of a contingency event; or
2. Have sufficient availability such that the resource can be dispatched on a pre-contingency basis as a preventative measure

By definition, slow demand response PDR cannot respond quickly enough to satisfy the first option. However, ISO planning studies have indicated that at current demand response penetration levels, existing slow demand response PDR generally has the required availability to satisfy the second option.

The slow demand response PDR effort was initiated as a result of a 2016 business practice manual (BPM) revision appeals decision in which the ISO committed to initiate a stakeholder process to develop a way to operationalize slow demand response resources. Doing so would allow these resources to remain eligible to provide local resource adequacy capacity and be used by the ISO when needed for local reliability needs. This resulted in the development of a new process to dispatch slow demand response PDR on a pre-contingency dispatch basis using a post-day-ahead market solution. The new process will dispatch slow demand response PDR after the day-ahead market runs, by assessing local area load and available resources. When the

---

<sup>2</sup> Notification time refers to the time required for a resource to go from its Pmin (generally zero megawatts for demand response) to responding to a dispatch instruction. This differs from startup time, which is the time period required for a resource to go from offline to its Pmin level

assessment determines that there is a shortfall in generation and import capability in the local area to meet the local area reliability needs, the ISO will efficiently issue exceptional dispatches to slow demand response PDR resource adequacy resources to make up for the shortfall upon conclusion of the day-ahead market.

The new slow demand response PDR process leverages the ISO's existing minimum online commitment constraint in the day-ahead market to efficiently determine when pre-contingency dispatching of slow demand response PDR is needed. Minimum online commitment constraints are market constraints enforced in the day-ahead market used to ensure sufficient units are committed to effectively address potential contingencies. The minimum online commitment helps ensure real-time reliability by committing resources in the day-ahead market to ensure system reliability following a contingency in real-time. ISO engineers define minimum online commitment constraints through engineering analysis to identify the minimum generation capacity requirements within local areas. While the minimum online commitment on its own cannot operationalize slow demand response for local needs, monitoring the ability to meet the minimum online commitment will be used to identify when slow demand response PDRs are needed.

When the minimum online commitment requirement cannot be met through commitment of available resources excluding slow demand response resources, the ISO will exceptionally dispatch local slow demand response PDR resource adequacy resources to meet the minimum online commitment insufficiency after the day-ahead market run. The ISO will dispatch the resources for energy, rather than committing them to start and go to a Pmin level, based on their bids submitted into the day-ahead market and their ability to resolve the local area need.

Because the ISO will dispatch slow demand response resources before a contingency occurs, as a preventive measure, the energy dispatches awarded to slow demand response PDRs must be maintained through real-time to preserve the pre-contingency dispatch. This informs slow demand response resources prior to the operating day the hours and the amount of load they are required to reduce.

Management proposes to settle the slow demand response PDR exceptional energy dispatches based on the higher of the resource's day-ahead market bid price or the real time fifteen minute locational marginal price. The post-day-ahead market process will select which slow demand response PDR to dispatch based on its day-ahead bid price and issue the exceptional dispatch prior to the operating day. This new tariff provision is needed because slow demand response PDR is the only resource type that requires a day-ahead energy exceptional dispatch (rather than just a commitment to start up and go to Pmin).

It is important to note that the ISO's new pre-contingency dispatch process requires the slow demand response PDRs providing resource adequacy to be shown on resource adequacy supply plans. Currently, the CPUC counts slow demand response as local resource adequacy through a "crediting" mechanism. The CPUC's crediting practice lowers the

resource adequacy requirements of load serving entities, but does not require CPUC jurisdictional load serving entities to show demand response resources on their resource adequacy plans. This practice prevents the ISO from applying its resource adequacy tariff provisions to demand response resources, including slow demand response PDRs. As a result, without an explicit showing of the demand response in the resource adequacy plan, the ISO is unable to account for demand response resource adequacy resources in its resource adequacy market systems.

In order for this new process to be technically feasible and effective, these resources must be shown to the ISO on supply plans as resource adequacy capacity. In the CPUC's resource adequacy proceeding, the ISO has provided a deep record on this particular issue and has petitioned the CPUC on the reasons why demand response that counts as resource adequacy capacity must be included on resource adequacy supply plans for the ISO to properly manage the operation of these resources under its tariff.<sup>3</sup> The CPUC has deferred further discussion on this matter until a future proceeding.

## **POSITIONS OF THE PARTIES**

Stakeholders did not submit comments expressing opposition or support of the proposed method for settlement of slow demand response pre-contingency dispatch or how the settlement price for resources receiving an exceptional dispatch energy instruction prior to the operating day would be set. This unopposed element is the only aspect of this proposal that requires Board approval.

All stakeholder comments received were on the new ISO process to dispatch slow demand response PDR on a pre-contingency dispatch for which the ISO already has tariff authority. These additional party positions have been provided below as context to the broader discussion:

Stakeholders are generally supportive of Management's efforts to integrate "slow" demand response PDR as a local capacity resource as a remedy to the ISO 2016 BPM appeals committee decision. Several stakeholders have expressed support that if a local capacity resource adequacy resource cannot respond within the required time period, the resource "should either not count towards meeting local requirements or be dispatched before the limiting contingency occurs."

Additionally, some stakeholder comments were supportive of Management's request that Investor Owned Utilities start showing their demand response resources on their resource adequacy supply plans as is required of all other resource adequacy resources, including third party offered resource adequacy demand response resources. Stakeholders, in opposition to these local resource adequacy resources

---

<sup>3</sup> Track 2 Proposals: <http://www.caiso.com/Documents/Feb21-2020-ResourceAdequacy-Track2-Proposals-R19-11-009.pdf>, and Track 2 Reply Comments: <http://www.caiso.com/Documents/Apr2-2020-ConsolidatedReplyComments-Track2Workshops-Proposals-ResourceAdequacy-R19-11-009.pdf>

being shown on a supply plan, maintain that the slow demand response PDR resources are available for dispatch through the markets and should not be subject to this resource adequacy requirement. Without being shown on a supply plan, these demand response resources are not subject to the ISO's resource adequacy tariff provisions like all other resource adequacy resources.

Stakeholders submitting comments opposing the slow demand response proposal base their opposition on its exclusion of slow reliability demand response resources from providing local RA, particularly if resources can timely respond "statistically" with a portion of their full capability within 20 minutes after a contingency. These resources are subject to strict dispatch rules and are only dispatched under emergency grid conditions, which is problematic under the new proposed pre-dispatch process for slow demand response resources. Furthermore, this type of "partially" local resource adequacy resource would be problematic for the ISO and CPUC to manage.

Comments were also received which neither supported nor opposed the proposal but expressed a general concern about demand response participation as resource adequacy resources including how they are modeled and used within the markets.

## **CONCLUSION**

Management requests Board approval of the new settlement provisions necessary to implement the new process for pre-contingency exceptional dispatches of slow demand response PDRs. The new provisions are necessary to facilitate the pre-contingency dispatch solution developed to enable slow demand response PDR to qualify as resource adequacy capacity in the local capacity areas in compliance with NERC standards.

Implementation of the slow demand response pre-contingency dispatch solution also satisfies the ISO 2016 BPM Executive Appeals Committee decision.

For these reasons, Management recommends that the Board approve the tariff modifications described in this memorandum.

**Stakeholder Processes: Resource Adequacy Enhancements, and Proxy Demand Resource - resource adequacy clarifications initiatives**

**Summary of Submitted Comments**

**Stakeholders submitted seven rounds of written comments to the ISO on the following dates:**

RA Enhancements initiative

- Round One: November 15, 2018
- Round Two: February 5, 2019
- Round Three: April 23, 2019
- Round Four: July 25, 2019
- Round Five: October 25, 2019

PDR – resource adequacy clarifications initiative

- Round Six: March 8, 2020
- Round Seven: April 17, 2020

This matrix summarizes the most recently submitted stakeholder comments on the final slow demand response proposal included in the PDR - resource adequacy clarifications initiative.

**Stakeholder comments are posted at:** <http://www.caiso.com/InitiativeDocuments/Stakeholder-Comments-ProxyDemandResource-ResourceAdequacyClarifications-FinalProposal.pdf>

**Other stakeholder efforts include:**

PDR – RA clarifications initiative

- Stakeholder Conference Call: April 3, 2020

- Stakeholder Conference Call: April 28, 2020

Resource Adequacy Enhancements

- Stakeholder Conference Call: October 30, 2018
- Stakeholder Meeting: January 23, 2019
- Stakeholder Meeting: April 8, 2019
- Stakeholder Meeting: July 8, 2019
- Stakeholder Meeting: October 9, 2019

ISO/CPUC Joint Workshops and CPUC Supply Side Working Group

- 2016 - 2019

Management Proposal	California Efficiency + Demand Management Council	California Large Energy Consumers Association (CLECA)	DMM	PG&E	SCE	SDGE	Management Response
<p><b>This is the proposal element requiring tariff change:</b></p> <p>Slow demand response pre-contingency dispatch settlement using day-ahead market bid price and resource specific, real-time fifteen minute LMP</p>	No Comment	No Comment	No Comment	No Comment	No Comment	No Comment	

Management Proposal	California Efficiency + Demand Management Council	California Large Energy Consumers Association (CLECA)	DMM	PG&E	SCE	SDGE	Management Response
Pre-contingency dispatch methodology of slow demand response after conclusion of the day-ahead market	<p>“Council” supports the ISO proposal with the following understanding:</p> <p>1) post day ahead exceptional dispatch decision will be made by approx. 3 p.m.</p> <p>2) only those PDRs on a supply plan providing local resource adequacy will be subject to pre-contingency dispatching to maintain local reliability</p> <p>3) slow demand response resources shown for local resource adequacy on a supply plan will be recognized in its Local Capacity Technical Studies.</p>	No Comment	<p>Does not support, stating “issues regarding how demand response resources are modeled in the market should be resolved before moving forward with the proposed dispatch process.”</p> <p>DMM has a broader concern about the cumulative effect of energy-limited or availability-limited resources being relied upon to meet an increasing portion of resource adequacy requirements</p>	No Comment	No Comment	No Comment	<p>The ISO continues to work with demand response stakeholders to ensure they are appropriately modeled in the market. This effort, however, is focused on operationalizing existing demand response resources that require advance notification of actual load reduction, rather than a commitment to be ready to reduce load. These resources are currently counting for local resource adequacy by the local regulatory authority but the ISO cannot access them within the time required for local contingencies.</p> <p>The ISO is working in its Resource Adequacy Enhancements initiative and in CPUC proceedings to implement policies that ensure energy sufficiency from the shown resource adequacy fleet.</p>

Management Proposal	California Efficiency + Demand Management Council	California Large Energy Consumers Association (CLECA)	DMM	PG&E	SCE	SDGE	Management Response
<p>Pre-contingency dispatch methodology will only consider slow demand response shown to the ISO as resource adequacy</p>				<p>PG&amp;E opposes ISO's proposal that only slow demand response that is shown on a supply plan should count for local resource adequacy</p>		<p>Resolution of whether to show Investor Owned Utility demand response on supply plans requires California Public Utilities Commission decision. It is premature to require the IOU PDRs on the supply plan because the ISO has not implemented the weather sensitive demand response solution as part of the energy storage distributed Energy resources Phase 4 ("ESDER 4") initiative. In the interim, IOUs could work with the ISO to provide a list of IOU-specific PDR resources and the net qualifying capacity values to better coordinate and achieve the ISO's solution.</p>	<p>ISO systems require visibility of specific resources being relied upon for local RA to determine which resources are available for dispatch through the ISO's proposed methodology. The only way to provide this visibility is through the supply plans. Requiring all resource adequacy demand response to be shown on supply plans also ensures all resource adequacy resources are subject to the same resource adequacy tariff provisions, such as the must offer obligation and Resource Adequacy Availability Incentive Mechanism treatment.</p>

Management Proposal	California Efficiency + Demand Management Council	California Large Energy Consumers Association (CLECA)	DMM	PG&E	SCE	SDGE	Management Response
Methodology will not pre-contingency dispatch reliability demand response resources	No Comment	<p>CLECA opposes, stating Reliability Demand Response Resource providing part of their full response capability within 20 minutes should count for local resource adequacy.</p> <p>Recognizes that to resolve their issue “CPUC resource adequacy accounting rules may be required...to have two resource adequacy values, one for local and another for system.”</p>	No Comment	<p>PG&amp;E recommends ISO work with stakeholders on a proposal to estimate the ramping value of resources (i.e., the ramping value of PG&amp;E’s Base Interruptible Program in 20 minutes which participates as reliability demand Response Resource) and approach to counting these resources for local resource adequacy.</p>	<p>SCE recommends the ISO delay adopting its Slow DR proposal until the CPUC issues a decision. ISO should work with the CPUC and stakeholders to develop proposal to estimate slow RDRR ramping value (i.e. the amount of load reduction that can be relied upon to have curtailed within the 20 minute time-frame) and count them as local resource adequacy.</p>	No Comment	<p>ISO agrees that the portion of a resource that reliably responds within the required period (if less than 100%) could be counted for local resource adequacy, however, there is no means by which this resource can also obtain a higher value for counting of its system RA as comments request. Under the proposal, RDRRs with the capability to obtain curtailment response within 20 minutes could qualify for local resource adequacy in the amount that is available within that time, however, this value would also have to be reflected as the resources system resource adequacy value, per current CPUC resource adequacy rules when reflected on a resource adequacy supply plan.</p>