



California Independent  
System Operator Corporation

November 17, 2014

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. ER14-2574-\_\_\_\_  
Compliance Filing – Flexible RA Capacity Requirements Amendment**

Dear Secretary Bose:

The California Independent System Operator Corporation (“CAISO”) submits this filing in compliance with the Federal Energy Regulatory Commission’s Order on Tariff Revisions issued on October 16, 2014 in the captioned docket.<sup>1</sup> The CAISO requests that the Commission accept the proposed tariff revisions as compliant with that order.

## **I. Background**

On August 1, 2014, the CAISO submitted a proposed tariff amendment in this proceeding to (1) include requirements and must offer obligations for flexible resource adequacy capacity needed by the CAISO to address the challenges of reliably operating the grid as the fleet of variable energy resources grows, and (2) add authority to the capacity procurement mechanism to enable the CAISO to undertake backstop procurement of flexible capacity in the event of a cumulative deficiency. On September 5, 2014, the CAISO filed an answer to comments and protests submitted in response to the CAISO’s tariff filing. The answer explained that the Commission should accept the proposed tariff amendment, subject to certain tariff clarifications and minor corrections that the CAISO agreed to make on compliance if ordered to do so by the Commission.

In the October 16 Order, the Commission conditionally accepted the proposed tariff revisions, subject to the compliance obligations discussed below. This filing contains the changes directed by the Commission.

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<sup>1</sup> *California Indep. Sys. Operator Corp.* 149 FERC ¶ 61,042 (2014) (“October 16 Order”).

## II. Compliance With October 16 Order

### A. Flexible Resource Adequacy Showing Requirement

Tariff Section 40.10.5.1(c)(2) establishes the submission requirement for monthly LSE Flexible RA Capacity Plans. In its answer, the CAISO offered to revise this section to clarify that the provision only requires load serving entities to submit informational showings to the CAISO, and does not impose a flexible resource adequacy capacity procurement requirement. The CAISO suggested the following revisions:

~~Demonstrate~~ Include information for purposes of the validation under Section 40.10.5.3(a) and the evaluation for cumulative deficiency under Section 40.10.5.3(c) that shows the MW of Flexible RA Capacity the Load Serving Entity met designates based on the total monthly requirement determined by the CAISO within the minimum or maximum quantity, as applicable, for each Flexible Capacity Category; or only if the Local Regulatory Authority has established its own flexible capacity requirement, ~~show~~ shows the MW of Flexible RA Capacity that the Load Serving Entity has met designates based on the total monthly requirement determined by the Local Regulatory Authority within the minimum or maximum quantity for each Flexible Capacity Category required by the Local Regulatory Authority, if applicable;

In the October 16 Order, the Commission directed the CAISO to clarify that the Tariff Section 40.10.5.1(c)(2) only imposes an information submission requirement on load serving entities.<sup>2</sup> The CAISO believes that the revisions suggested in its answer comply with the Commission's directive and has included them in the compliance tariff sheets.

### B. Forecast Adjustment

Tariff Section 40.10.2.1(c) addresses the allocation of the forecast adjustment. In its answer to comments, the CAISO suggested that it would revise this tariff section on compliance to better clarify the intended allocation by specifying that any forecast adjustment is applied to the total flexible capacity requirement and allocated in accordance with proposed Section 40.10.2.1(b).

The October 16 Order directs the CAISO to submit further revisions that explain how it will apply the allocation of responsibilities resulting from any changes in flexible capacity needs due to application of the forecast adjustment.<sup>3</sup> In compliance with this

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<sup>2</sup> *Id.* at P 48.

<sup>3</sup> *Id.* at P 69.

directive, the CAISO revised tariff sheets clearly allocate the forecast adjustment based on each Local Regulatory Authority's peak load ratio share. In the October 16 Order, FERC found the CAISO's proposed allocation of the most severe single contingency or 3.5 percent of forecasted peak load for each local regulatory authority based on its peak load ratio share to be just and reasonable.<sup>4</sup>

As noted in the CAISO's transmittal letter, the intent of the forecast adjustment is "to increase or decrease the higher of the 3.5 percent or the most severe single contingency for each month based on the actual amount of flexible capacity that is being maintained as contingency reserve."<sup>5</sup> The forecast adjustment is essentially an adjustment of the 3.5 percent or the most severe single contingency component of the flexible capacity need and, as such, it should be subject to the same allocation methodology. Use of the same allocation methodology will ensure that the costs or benefits of any increase or decrease in the flexible capacity need caused by the forecast adjustment are allocated consistent with the need for the forecast adjustment. Therefore, the compliance tariff language allocates the forecast adjustment using the same methodology used for the portion of the flexible capacity need that addresses contingency reserves described in Section 40.10.2.1(b). This appropriately ensures that the methodologies for determining the adjustment and the allocation of that adjustment are consistent.

In compliance with the Commission's directive, the CAISO has revised Tariff Section 40.10.2.1(c) to clearly reflect this allocation methodology for the forecast adjustment as follows:

If the CAISO includes a forecast adjustment in its draft study results, it will allocate the forecast adjustment using the same methodology set forth in Section 40.10.2.1(b).

### **C. Eligibility to Provide Flexible Capacity**

Tariff Section 40.10.3.2 allows a load serving entity to combine two use-limited resources that do not meet the eligibility criteria for the base ramping flexible capacity category to form a combined resource that meets that criteria. The October 16 Order directs the CAISO to also allow combined resources to meet the eligibility criteria for the peak and super-peak flexible capacity categories, or explain why that is not feasible.<sup>6</sup>

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<sup>4</sup> October 16 Order at P 44.

<sup>5</sup> Transmittal letter at p. 26.

<sup>6</sup> *Id.* at P 80.

In accordance with the Commission's directive, the CAISO proposes that two combined use-limited resources be eligible for the peak and super-peak flexible capacity categories if they meet the applicable criteria. The CAISO has added Tariff Sections 40.10.3.3(b)(2)-(4) and 40.10.3.4(b)(2)-(4) to allow a load serving entity to include two combined use-limited resources in the peak and super-peak flexible capacity categories and to specify the eligibility criteria that the combined resources must meet for inclusion, as follows:

For peak ramping resources, the CAISO has added the following provisions:

**Section 40.10.3.3(b)(2)**

A Load Serving Entity may include in this category a combined resource consisting of two Use-Limited Resources that do not individually meet the minimum operational and availability requirements but in combination meet the criteria in Section 40.10.3.3(a).<sup>7</sup>

**Section 40.10.3.3(b)(3)**

The Flexible RA Capacity amount for the combined resource will be less than or equal to the lowest Effective Flexible Capacity value shown on the Resource Flexible RA Capacity Plan for a resource in the combination.

**Section 40.10.3.3(b)(4)**

Both resources in the combination shall be subject to the must-offer obligation up to their Flexible RA Capacity amounts.

For super-peak ramping resources, the CAISO has added the following provisions:

**Section 40.10.3.4(b)(2)**

A Load Serving Entity may include in this category a combined resource consisting of two Use-Limited Resources that do not individually meet the minimum operational and availability requirements but in combination meet the criteria in Section 40.10.3.4(a).<sup>8</sup>

**Section 40.10.3.4(b)(3)**

The Flexible RA Capacity amount for the combined resource will be less than

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<sup>7</sup> Adding this section will require the CAISO renumber 40.10.3.3(b) as 40.10.3.3(b)(1).

<sup>8</sup> Adding this section will require the CAISO renumber 40.10.3.4(b) as 40.10.3.4(b)(1).

or equal to the lowest Effective Flexible Capacity value shown on the Resource Flexible RA Capacity Plan for a resource in the combination.

**Section 40.10.3.4(b)(4)**

Both resources in the combination shall be subject to the must-offer obligation up to their Flexible RA Capacity amounts.

Except for the references to the applicable tariff provision for the peak and super-peak flexible capacity categories, this compliance tariff language is identical to the language in Section 40.10.3.2(b)(2)-(4), which the Commission approved to allow a combination of two resources to meet the base ramping flexible capacity category. The CAISO submits that these revisions comply with the Commission's directive.

**D. Calculation of Effective Flexible Capacity**

Tariff Section 40.10.4 establishes how the CAISO will determine the effective flexible capacity value for each flexible resource.<sup>9</sup> The October 16 Order directs the CAISO to revise that section to remove the requirement that a resource must have submitted at least one economic bid in the real-time market on at least 10 days in the previous calendar year, or in the most recent 12-month period for which data is available, in order to automatically receive an effective flexible capacity value. The CAISO's compliance tariff sheets delete the prior-bid requirement, as directed by the Commission.

Tariff Section 40.10.4.1(f) provides the method for the CAISO to calculate the effective flexible capacity of a combined heat and power resource. In its answer to the comments of the QF parties, the CAISO agreed to modify the provision to better reflect the operational constraints of combined heat and power resources. Specifically, the CAISO proposed to modify the provision as follows:

The Effective Flexible Capacity value of a Combined Heat and Power Resource will be the lesser of (i) the resource's Net Qualifying Capacity, or (ii) the MW difference between the CHP resource's maximum output and its the minimum of either its operating level, such quantity not to exceed the quantity of generating capacity capable of being delivered or is capability over a three-hour period.

The October 16 Order directs the CAISO to clarify the calculation in Section 40.10.4.1(f)(ii) to reflect the revisions suggested by the QF parties in order to better reflect the operating requirements of combined heat and power resources. The

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<sup>9</sup> *Id.* at P 90.

modifications the CAISO suggested in its answer reflect the changes suggested by the QF parties, and the CAISO has included them in the compliance tariff sheets.

### **E. Must-Offer Obligations**

Tariff Section 40.10.6.1(e) sets forth the must-offer obligation for use-limited resources providing flexible resource adequacy capacity. In response to comments on the requirement, the CAISO stated in its answer to comments that it was willing to provide a limited exception from the ancillary services must-offer obligation for use-limited resources.

The October 16 Order directs the CAISO to modify the ancillary services must-offer obligation to establish such a limited exception for use-limited resources.<sup>10</sup> In compliance with this directive, the CAISO is deleting the requirement in section 40.10.6.1 (e) for a use-limited resource shown as flexible capacity to submit ancillary service bids even if its flexible capacity is certified to ancillary services. Further, the CAISO has added language in sections 40.10.3.2(b)(1), 40.10.3.3(b)(1), and 40.10.3.4(b)(1) to clarify that use-limited resources providing Flexible RA Capacity are not required to submit bids for Ancillary Service bids in the Day-Ahead Market in order to be eligible to be a Base Ramping Resource, Peak Ramping Resource, or Super-Peak Ramping Resource.

### **F. Miscellaneous Ministerial Tariff Revisions**

At the direction of the Commission in the October 6 Order,<sup>11</sup> the CAISO is including in this compliance filing the following “clean-up” tariff revisions –

- Appendix A Definitions -- the definition of “Flexible RA Capacity” is modified, consistent with the CAISO’s answer, to provide as follows: “The Flexible Capacity of a resource listed on an LSE Flexible RA Capacity Plan and a Resource Flexible RA Capacity Plan.”
- Section 40.10.1.4(a) -- the reference to “Section 40.10.3(3)” is corrected to “Section 40.10.1.3(3)”;
- Section 40.10.4.1(f) -- in the second line, “be” is inserted after “will”.
- Section 40.10.5.6(a)(3) – the reference to “Section 40.10.5.6(1)” is changed to “Section 40.10.5.6(a)(1)”, and the reference to “Section 40.10.5.6(2)” is changed to “Section 40.10.5.6(a)(2)”.

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<sup>10</sup> *Id.* at P 100.

<sup>11</sup> *Id.* at P 109.

- Section 43.4 is revised as follows:

The CAISO will endeavor to designate a resource at the CPM Capacity price determined in accordance with Section ~~43.6.1~~ 43.7.1 before selecting a resource with a higher unit-specific CPM Capacity price specified under Section ~~43.6.2~~ 43.7.2. The CAISO will endeavor to designate resources that have specified a capacity price before designating resources that have not specified a CPM Capacity price under Section ~~43.6.2.1~~ 43.7.2.1.

### III. **Materials Provided in this Compliance Filing**

In addition to this transmittal letter, this compliance filing includes Attachments A and B. Attachment A contains clean CAISO tariff sheets reflecting the tariff revisions described above. Attachment B shows these revisions in black-line format.

Respectfully submitted,

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Dated: November 17, 2014

## CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon the parties listed on the official service list in the captioned proceeding, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, CA, this 17<sup>th</sup> day of November, 2014.

/s/ Sarah Garcia  
Sarah Garcia



**Attachment A – Clean Tariff Records**

**Compliance Filing – Flexible RA Capacity Requirements Amendment**

**California Independent System Operator Corporation**

#### **40.10.1.4 Flexible Capacity Need Forecast Adjustment**

- (a) The Flexible Capacity Need determination may include a positive or negative forecast adjustment to capture a systemic difference between the value determined in Section 40.10.1.3(3) and the historic amount of Operating Reserves met by Flexible Capacity:
- (b) The CAISO will determine the need for a forecast adjustment in consultation with the CPUC and other Local Regulatory Authorities, and as part of the stakeholder process under Section 40.10.1.1; and
- (c) The amount of the forecast adjustment calculated for each month shall not exceed the forecasted monthly peak Operating Reserves multiplied by the difference between (i) the historic percentage of Operating Reserves met by Flexible RA Capacity and (ii) the percentage calculation that results from dividing the quantity determined in Section 40.10.1.3(3) by the forecasted monthly peak Operating Reserves.

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#### **40.10.2.1 Calculation of LRA Allocations**

- (a) **Allocation of Maximum Three-Hour Net-Load Ramp.** The CAISO will calculate the Local Regulatory Authority's allocable share of the Flexible Capacity Need as the average of the sum of its jurisdictional Load Serving Entities' change in load, minus the change in wind output, minus the change in solar PV output, minus the change in solar thermal output during the five highest three-hour net-load changes in the month.
- (b) **Allocation of MSSC or Forecasted Peak Load.** The CAISO will determine the higher of the most severe single contingency or 3.5 percent of forecasted peak load for each Load Serving Entity based on the respective Load Serving Entity's peak load ratio share, and calculate each Local Regulatory Authority's allocable share based on the sum of its jurisdictional Load Serving Entities' shares.
- (c) **Allocation of Forecast Adjustment.** If the CAISO includes a forecast adjustment in its draft study results, it will allocate the forecast adjustment using the same methodology set forth in Section 40.10.2.1(b).

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#### **40.10.3.2 Flexible Capacity Category-- Base Ramping Resources**

- (a) **Resource Criteria.** Base ramping resources must meet all of the following criteria, except as provided in Sections 40.10.3.2(b) and (c) --
- (1) The resource must be capable of providing Flexible RA Capacity to the CAISO Markets through Economic Bids for Energy and Economic Bids for Ancillary Services that are not flagged as Contingency Only in the Day-Ahead Market, if and to the extent the resource is certified to provide Ancillary Services, submitted daily for the 17-hour period from 5:00 a.m. through 10:00 p.m.;
  - (2) The resource must be capable of providing Energy for a minimum of six hours up to its full Effective Flexible Capacity value including PMin;
  - (3) The resource must be capable of being available seven days a week;
  - (4) The resource must be able to provide the minimum of (i) two Start-Ups per day for every day of the month or sixty Start-Ups per month, or (ii) the number of Start-Ups allowed by its operational limits, including minimum up and minimum down time; and
  - (5) The resource must not have annual or monthly limitations on the number of Start-Ups or the amount of energy produced that, on a daily basis, are lower than the requirements in Section 40.10.3.2(a)(1) through (4).
- (b) **Use-Limited Resource**
- (1) A Use-Limited Resource may be included in this category if it meets the criteria in Section 40.10.3.2(a), except that use-limited resources providing Flexible RA Capacity are not required to submit bids for Ancillary Service bids in the Day-Ahead Market.
  - (2) A Load Serving Entity may include in this category a combined resource consisting of two Use-Limited Resources that do not individually meet the minimum operational and availability requirements but in combination meet the criteria in Section 40.10.3.2(a).

- (3) The Flexible RA Capacity amount for the combined resource will be less than or equal to the lowest Effective Flexible Capacity value shown on the Resource Flexible RA Capacity Plan for a resource in the combination.
- (4) Both resources in the combination shall be subject to the must-offer obligation up to their Flexible RA Capacity amounts.
- (c) **Non-Generator Resource.** A Non-Generator Resource that elects to provide Flexible RA Capacity may be included in this category if it meets the criteria in Section 40.10.3.2(a). A Non-Generator Resource that elects to provide Flexible RA Capacity and Regulation Energy Management is not eligible to be included in this category.

#### **40.10.3.3 Flexible Capacity Category -- Peak Ramping Resources**

- (a) **Resource Criteria.** Peak ramping resources must meet all of the following criteria, except as provided in Sections 40.10.3.3(b) and (c) --
  - (1) The resource must be capable of providing Flexible RA Capacity to the CAISO Markets through Economic Bids for Energy and Economic Bids for Ancillary Services that are not flagged as Contingency Only in the Day-Ahead Market, if and to the extent the resource is certified to provide Ancillary Services, which must be submitted daily for a five-hour period to be determined by the CAISO on a seasonal basis;
  - (2) The resource must be capable of providing Energy for a minimum of three continuous hours up to its full Effective Flexible Capacity value including PMin;
  - (3) The resource must be capable of being available seven days a week.
  - (4) The resource must be capable of at least one Start-Up per day; and
  - (5) The resource must not have annual or monthly limitations on the number of unit Start-Ups or the amount of energy produced that, on a daily basis, are lower than the requirements in Section 40.10.3.3(a)(1) through (4).
- (b) **Use-Limited Resource.**
  - (1) A Use-Limited Resource may be included in this category if it meets the criteria in Section 40.10.3.3(a), except that use-limited resources providing Flexible RA

Capacity are not required to submit bids for Ancillary Service bids in the Day-Ahead Market.

- (2) A Load Serving Entity may include in this category a combined resource consisting of two Use-Limited Resources that do not individually meet the minimum operational and availability requirements but in combination meet the criteria in Section 40.10.3.3(a).
  - (3) The Flexible RA Capacity amount for the combined resource will be less than or equal to the lowest Effective Flexible Capacity value shown on the Resource Flexible RA Capacity Plan for a resource in the combination.
  - (4) Both resources in the combination shall be subject to the must-offer obligation up to their Flexible RA Capacity amounts.
- (c) **Non-Generator Resource.** A Non-Generator Resource that elects to provide Flexible RA Capacity may be included in this category if it meets the criteria in Section 40.10.3.3(a). A Non-Generator Resource that elects to provide Flexible RA Capacity and Regulation Energy Management is not eligible to be included in this category.
- (d) **Base Ramping Resource.** A resource that meets the qualifications of the Flexible Capacity Category for base ramping resources also qualifies to be included in this category as a peak ramping resource; however, a resource that meets only the qualifications of a peak ramping resource does not qualify as a base ramping resource.

#### **40.10.3.4 Flexible Capacity Category -- Super-Peak Ramping Resources.**

- (a) **Resource Criteria.** Super-peak ramping resources must meet all of the following criteria, except as provided in Sections 40.10.3.4(b), (c) and (d) --
- (1) The resource must be capable of providing Flexible RA Capacity to the CAISO Markets through Economic Bids for Energy and Economic Bids for Ancillary Services Bids that are not flagged as Contingency Only in the Day-Ahead Market, if and to the extent the resource is certified to provide Ancillary Services, which must be submitted each weekday that is not holiday, for a five-hour period to be determined by the CAISO on a seasonal basis;

- (2) The resource must be capable of providing Energy for a minimum of three continuous hours up to its full Effective Flexible Capacity value including PMin;
- (3) The resource must be capable of being available on weekdays that are not holidays, as defined in the Business Practice Manual;
- (4) The resource must be capable of at least one Start-Up per day; and
- (5) The resource must be capable of responding to at least five CAISO dispatches per month, during the five-hour period of the must offer obligation, for the resource to Start-Up.

(b) **Use-Limited Resource.**

- (1) A Use-Limited Resource may be included in this category if it meets the criteria in Section 40.10.3.4(a), except that use-limited resources providing Flexible RA Capacity are not required to submit bids for Ancillary Service bids in the Day-Ahead Market.
- (2) A Load Serving Entity may include in this category a combined resource consisting of two Use-Limited Resources that do not individually meet the minimum operational and availability requirements but in combination meet the criteria in Section 40.10.3.4(a).
- (3) The Flexible RA Capacity amount for the combined resource will be less than or equal to the lowest Effective Flexible Capacity value shown on the Resource Flexible RA Capacity Plan for a resource in the combination.
- (4) Both resources in the combination shall be subject to the must-offer obligation up to their Flexible RA Capacity amounts.

(c) **Non-Generator Resource.** A Non-Generator Resource may be included in this category if it meets the criteria in Section 40.10.3.4(a) and is not registered in the CAISO's Master File as a Regulation Energy Management resource.

(d) **Non-Generator Resource, Regulation Energy Management.** A Non-Generator Resource that is a Regulation Energy Management resource may be included in this category if it meets the following criteria --

- (1) The resource must be capable of providing Regulation Energy Management to the CAISO Markets through Economic Bids for Regulation Up and Regulation Down submitted daily for a 17-hour period from 5:00 a.m. through 10:00 p.m.;
  - (2) The resource shall not submit bids to provide Energy;
  - (3) The resource must be capable of being available seven days a week;
  - (4) The resource must be capable of unlimited Start-Ups per day; and
  - (5) The resource must be registered as a Non-Generator Resource providing Regulation Energy Management in the CAISO's Master File.
- (e) **Base Ramping and Peak Ramping Resources.** A resource that meets the qualifications of the Flexible Capacity Category for base ramping resources or peak ramping resources also qualifies to be included in this category as a super-peak ramping resource; however, a resource that meets only the qualifications of a super-peak ramping resource does not qualify as a base ramping resource or a peak ramping resource.

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#### **40.10.4.1 Effective Flexible Capacity Calculation**

- (a) **Flexible Resources.** The CAISO will calculate the Effective Flexible Capacity value of a resource, for use (i) if a Local Regulatory Authority has not established criteria for calculating the Effective Flexible Capacity value for eligible resource types, and (ii) for determining if a cumulative deficiency exists under Sections 43.2.7(a) and (b), as follows, except as provided in Sections 40.10.4.1 (b) through (f) --
- (1) If the Start-Up Time of the resource is greater than 90 minutes, the Effective Flexible Capacity value shall be the weighted average ramp rate of the resource calculated from PMin to Net Qualifying Capacity multiplied by 180 minutes. The Effective Flexible Capacity shall not exceed the difference between the PMin and PMax of the resource.
  - (2) If the Start-Up Time of the resource is less than or equal to 90 minutes, the Effective Flexible Capacity value shall be the weighted average ramp rate of the resource calculated from zero to Net Qualifying Capacity multiplied by 180

minutes. The Effective Flexible Capacity shall not exceed the Net Qualifying Capacity of the resource.

- (b) **Hydroelectric Generating Unit.** The Effective Flexible Capacity of a hydroelectric generating unit will be the amount of capacity from which the resource can produce Energy consistently for 6 hours based upon the resource's physical storage capacity, which shall not exceed its Net Qualifying Capacity.
- (c) **Proxy Demand Response Resource.** The Effective Flexible Capacity of a Proxy Demand Response Resource will be based on the resource's actual MWs of load modification in response to a dispatch by the CAISO during a test event. In determining the Effective Flexible Capacity of a Proxy Demand Response Resource, the CAISO will --
  - (1) conduct the test at a random time during the flexible capacity must-offer obligation period for the resource;
  - (2) use the baseline load data, as described in the CAISO Tariff or Business Practice Manual, to measure the load modification for the Proxy Demand Response Resource being tested; and
  - (3) pay the resource's bid price for the testing period.
- (d) **Energy Storage Resource.** The Effective Flexible Capacity value for an energy storage resource will be determined as follows --
  - (1) for an energy storage resource that provides Flexible RA Capacity but not Regulation Energy Management, the Effective Flexible Capacity value will be the MW output range the resource can provide over three hours of charge/discharge while constantly ramping.
  - (2) for an energy storage resource that provides Flexible RA Capacity and Regulation Energy Management, the Effective Flexible Capacity value will be the resource's 15-minute energy output capability.
- (e) **Multi-Stage Generating Resource.** The Effective Flexible Capacity value for a Multi-Stage Generating Resource will be calculated using the longest Start-Up Time of the resource's configuration that has the lowest PMin.



- (f) **Combined Heat and Power Resource.** The Effective Flexible Capacity value of a Combined Heat and Power Resource will be the lesser of (i) the resource's Net Qualifying Capacity, or (ii) the MW difference between the CHP resource's maximum output and its minimum operating level, such quantity not to exceed the quantity of generating capacity capable of being delivered over a three-hour period.

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#### **40.10.5.1 LSE Flexible RA Capacity Plans**

- (a) **Submission Requirement.** A Scheduling Coordinator must submit annual and monthly LSE Flexible RA Capacity Plans for each Load Serving Entity it represents; except that an annual plan for 2015 is not required. A Load-Following MSS is not required to submit annual or monthly LSE Flexible RA Capacity Plans.
- (b) **Annual Plan.** Each annual LSE Flexible RA Capacity Plan must –
- (1) demonstrate that the Load Serving Entity has procured for each month at least 90 percent of the annual Flexible RA Capacity requirement determined by the CAISO; or the amount of Flexible RA Capacity required by the Load Serving Entity's Local Regulatory Authority, if the Local Regulatory Authority has set such requirement;
  - (2) identify the resources the Load Serving Entity intends to rely on to provide the Flexible RA Capacity; and
  - (3) include all information and be submitted no later than the last Business Day in October, in accordance with the reporting requirements and schedule set forth in the Business Practice Manual.
- (c) **Monthly Plan.** The monthly LSE Flexible RA Capacity Plan must --
- (1) demonstrate that the Load Serving Entity procured 100 percent of the total monthly Flexible RA Capacity requirement determined by the CAISO; or the monthly amount of Flexible RA Capacity required by the Local Regulatory Authority, if the Local Regulatory Authority has set such requirement;
  - (2) include information for purposes of the validation under Section 40.10.5.3(a) and

the evaluation for cumulative deficiency under Section 40.10.5.3(c) that shows the MW of Flexible RA Capacity the Load Serving Entity designates based on the total monthly requirement determined by the CAISO within the minimum or maximum quantity, as applicable, for each Flexible Capacity Category; or only if the Local Regulatory Authority has established its own flexible capacity requirement, shows the MW of Flexible RA Capacity the Load Serving Entity designates based on the total monthly requirement determined by the Local Regulatory Authority within the minimum or maximum quantity for each Flexible Capacity Category required by the Local Regulatory Authority, if applicable;

- (3) identify all resources the Load Serving Entity will rely on to provide the Flexible RA Capacity and for each resource specify the Flexible Capacity Category in which the Flexible RA Capacity will be provided; and
- (4) include all information and be submitted to the CAISO at least 45 days in advance of the first day of the month covered by the plan, in accordance with the reporting requirements and schedule set forth in the Business Practice Manual.

- (d) **Correction to Monthly Plan.** The Scheduling Coordinator for the Load Serving Entity may submit at any time from 45 days through 11 days in advance of the first day of the month covered by the plan, a revision to its monthly LSE Flexible RA Capacity Plan to correct an error in the plan. The CAISO will not accept any revisions to a monthly LSE Flexible RA Capacity Plan from 10 days in advance of the relevant month through the end of the month, unless the Scheduling Coordinator for the Load Serving Entity demonstrates good cause for the change and explains why it was not possible to submit the change earlier.

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#### **40.10.5.6 LRA Deficiency.**

- (a) **Finding and Notification.** If the CAISO's evaluation under Section 40.10.5.3(c) finds a cumulative deficiency in Flexible RA Capacity, the CAISO will --

- (1) identify each Local Regulatory Authority that did not meet its allocable share of the Flexible Capacity Need using the cumulative amount of Flexible RA Capacity that the Local Regulatory Authority's jurisdictional Load Serving Entities included in their annual and monthly Flexible RA Capacity Plans in total and, for the monthly Flexible RA Capacity Plans, in each Flexible Capacity Category;
  - (2) identify each Load Serving Entity that (i) is subject to the jurisdiction of a Local Regulatory Authority that did not meet its allocable share of the Flexible Capacity Need under Section 40.10.5.6, and (ii) did not include sufficient Flexible RA Capacity in an annual or monthly plan to meet its allocated Flexible RA Capacity Requirement or did not meet the monthly requirement within the minimum or maximum quantity, as applicable, for each Flexible Capacity Category, based on the allocation methodology of the Local Regulatory Authority if it has established its own methodology for allocating the Flexible Capacity Need to its jurisdictional Load Serving Entities;
  - (3) notify each Local Regulatory Authority identified under Section 40.10.5.6(a)(1) and the Scheduling Coordinator for each Load Serving Entity identified under Section 40.10.5.6(a)(2) of the cumulative deficiency in an attempt to resolve any deficiency in accordance with the procedures set forth in the Business Practice Manual; and
  - (4) provide the notice at least 25 days in advance of the first day of the month covered by the plan and include the reasons the CAISO believes a cumulative deficiency exists.
- (b) **Resolved Deficiency.** If the CAISO provides a notice of cumulative deficiency under Section 40.10.5.6(a), and the deficiency is resolved, the Scheduling Coordinator for the Load Serving Entity shall demonstrate, no less than 11 days prior to the first day of the month covered by the LSE Flexible RA Capacity Plan, that the identified deficiency is cured by submitting a revised LSE Flexible RA Capacity Plan.

- (c) **Unresolved Deficiency.** If the CAISO provides a notice of deficiency under Section 40.10.5.6(a) and is not advised that the deficiency is resolved, the CAISO will use the information contained in the Resource Flexible RA Capacity Plan to set the obligations of resources under Section 40.10 and/or to assign any costs incurred under this Section 40 and Section 43.

\* \* \*

#### **40.10.6.1 Day-Ahead and Real-Time Availability**

- (a) **Must-Offer Obligation.** The Scheduling Coordinator for a resource supplying Flexible RA Capacity must submit Economic Bids for Energy for the full amount of the resource's Flexible RA Capacity, and Economic Bids for Ancillary Services that are not flagged as Contingency Only in the Day-Ahead Market for the full amount of the resource's Flexible RA Capacity that is certified to provide Ancillary Services, in the Day-Ahead Market and the Real-Time Market for the applicable Trading Hours that is capable of being economically dispatched as follows, except as provided in Section 40.10.6.1(e) through(h) --
- (1) Flexible Capacity Category for base ramping resources - the 17-hour period from 5:00 a.m. to 10:00 p.m., seven days a week;
  - (2) Flexible Capacity Category for peak ramping resources - the five-hour period determined for each season by the CAISO's Flexible Capacity Needs Assessment, seven days a week; and
  - (3) Flexible Capacity Category for super-peak ramping resources – the five-hour period determined for each season by the CAISO's Flexible Capacity Needs Assessment, weekdays, except holidays and as provided in Section 40.10.6.1(h), until the resource receives during the five-hour period of the must offer obligation and responds to five CAISO dispatches for Start-Up during the month, after which the resource will not be subject to a must-offer obligation as a super-peak ramping resource for the remainder of that month; however, any other must-offer obligations for Resource Adequacy Capacity will still apply.

- (b) **Availability Requirement.** During the period of the applicable must-offer obligation, a Flexible RA Capacity Resource must be operationally available except for limitations specified in the Master File, legal or regulatory prohibitions or as otherwise required by this CAISO Tariff or by Good Utility Practice.
- (c) **Co-optimization.** Through the IFM co-optimization process, the CAISO will utilize available Flexible RA Capacity to provide Energy or Ancillary Services in the most efficient manner to clear the Energy market, manage congestion and procure required Ancillary Services.
- (d) **Participation in RUC.** A Flexible RA Capacity Resource must participate in the RUC to the extent that the resource has available Flexible RA Capacity that is not reflected in an IFM Schedule. Resource Adequacy Capacity participating in RUC will be optimized using a zero dollar (\$0/MW-hour) RUC Availability Bid. Flexible RA Capacity selected in RUC will not be eligible to receive a RUC Availability Payment.
- (e) **Use-Limited Resources.** A Use-Limited Resource providing Flexible RA Capacity must be capable of responding to Dispatch Instructions and, consistent with its use-limitations, must submit Economic Bids for Energy for the full amount of its Flexible RA Capacity in the Day-Ahead Market and the Real-Time Market for the Trading Hours applicable to the resource's Flexible Capacity Category for that month for the Trading Hours that it is capable of being economically dispatched.
- (f) **Short, Medium or Long Start Units.**
  - (1) Short Start Units or Medium Start Units providing Flexible RA Capacity that do not have an IFM Schedule or a RUC Schedule for any of their Resource Adequacy Capacity for a given Trading Hour are required to participate in the Real-Time Market consistent with the provisions in Section 40.6.3 that apply to Short Start Units providing RA Capacity.
  - (2) Long Start Units providing Flexible RA Capacity that do not have an IFM Schedule or a RUC Schedule for any of their Resource Adequacy Capacity for a given Trading Hour are required to participate in the Real-Time Market consistent

with the provisions in Section 40.6.7 that apply to Long Start Units providing RA Capacity.

- (3) If availability is required under Section 40.6.3 or 40.6.7, the Scheduling Coordinator for the resource must submit to the RTM for that Trading hour for which the resource is capable of responding to Dispatch Instructions: (i) Energy Bids for the full amount of the available Flexible RA Capacity, including capacity for which it has submitted Ancillary Services Bids; and (ii) Ancillary Services Bids for the full amount of its Flexible RA Capacity that is certified to provide Ancillary Services, and for each Ancillary Service for which the resource is certified, including capacity for which it has submitted Energy Bids.
- (g) **Extremely Long-Start Resources.** Flexible RA Capacity Resources that are Extremely Long-Start Resources must be available to the CAISO by complying with the Extremely Long-Start Commitment Process under Section 31.7 or otherwise committing the resource upon instruction from the CAISO, if physically capable. Once an Extremely Long-Start Resource is committed by the CAISO, it is subject to the provisions of Section 40.10.6 regarding Day-Ahead Availability and Real-Time Availability for the Trading Days for which it was committed.
- (h) **Non-Generator Resources, Regulation Energy Management.** Non-Generator Resources providing Flexible RA Capacity and Regulation Energy Management must submit Bids for Regulation Up and Regulation Down for Trading Hours in the 17-hour period from 5:00 a.m. to 10:00 p.m., seven days a week and shall not submit Bids for Energy or other Ancillary Services.

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#### **43.4 Selection Of Eligible Capacity Under The CPM**

In accordance with Good Utility Practice, the CAISO shall make designations of Eligible Capacity as CPM Capacity or CPM Flexible Capacity under Section 43.1 by applying the following criteria in the order listed:

- (1) the effectiveness of the Eligible Capacity at meeting the designation criteria specified in Section 43.2;
- (2) the capacity costs associated with the Eligible Capacity;
- (3) the quantity of a resource's available Eligible Capacity, based on a resource's PMin, relative to the remaining amount of capacity needed;
- (4) the operating characteristics of the resource, such as dispatchability, Ramp Rate, and load-following capability;
- (5) whether the resource is subject to restrictions as a Use-Limited Resource; and
- (6) for designations under Section 43.2.3, the effectiveness of the Eligible Capacity in meeting local and/or zonal constraints or other CAISO system needs.

In applying these selection criteria, the goal of the CAISO is to designate lower cost resources that will be effective in meeting the reliability needs underlying the CPM designations. In making this determination, the CAISO will apply the first criterion to identify the effective Eligible Capacity by considering the effectiveness of the resources at meeting the designation criteria for the type of CPM to be issued and at resolving the underlying reliability need. The CAISO will apply the second criterion by considering the cost of the effective Eligible Capacity. The CAISO will endeavor to designate a resource at the CPM Capacity price determined in accordance with Section 43.7.1 before selecting a resource with a higher unit-specific CPM Capacity price specified under Section 43.7.2. The CAISO will endeavor to designate resources that have specified a capacity price before designating resources that have not specified a CPM Capacity price under Section 43.7.2.1. The CAISO will apply the third criterion by considering the quantity of a resource's Eligible Capacity. The CAISO will endeavor to select a resource that has a PMin at or below the capacity that is needed to meet the reliability need before selecting a resource that has a PMin that would result in over-procurement. The CAISO will apply the fourth criterion by considering specific operating characteristics of a resource, such as dispatchability, ramp rate, and load-following capability to the extent that such characteristics are an important factor in

resolving the reliability need. The CAISO will apply the fifth criterion by considering whether a resource is use-limited and whether that status may restrict its ability to be available to the CAISO in the Day-Ahead Market and Real-Time Market throughout the period for which it is being procured. To the extent that use-limited resources are capable of performing the required service for the duration of the CPM designation, the CAISO will not unduly discriminate in favor of non-Use Limited resources when applying the selection criteria. The CAISO will apply the sixth criterion by considering the effectiveness of the Eligible Capacity to meet local and/or zonal constraints or other CAISO system needs for CPM designations under 43.2.3. If after applying these criteria, two or more resources that are eligible for designation equally satisfy these criteria, the CAISO shall utilize a random selection method to determine the designation between those resources.

While the CAISO does not have to designate the full capability of a resource, the CAISO may designate under the CPM an amount of CPM Capacity from a resource that exceeds the amount of capacity identified to ensure compliance with the Reliability Criteria set forth in Section 40.3 due to the PMin or other operational requirements/limits of a resource that has available capacity to provide CPM service. The CAISO shall not designate the capacity of a resource for an amount of capacity that is less than the resource's PMin.

\* \* \*

## **Appendix A**

### **Master Definition Supplement**

\* \* \*

#### **- Flexible RA Capacity**

The Flexible Capacity of a resource listed on an LSE Flexible RA Capacity Plan and a Resource Flexible RA Capacity Plan.

\* \* \*



**Attachment B – Marked Tariff Records**

**Compliance Filing – Flexible RA Capacity Requirements Amendment**

**California Independent System Operator Corporation**

#### 40.10.1.4 Flexible Capacity Need Forecast Adjustment

- (a) The Flexible Capacity Need determination may include a positive or negative forecast adjustment to capture a systemic difference between the value determined in Section 40.10.1.3(3) and the historic amount of Operating Reserves met by Flexible Capacity:
- (b) The CAISO will determine the need for a forecast adjustment in consultation with the CPUC and other Local Regulatory Authorities, and as part of the stakeholder process under Section 40.10.1.1; and
- (c) The amount of the forecast adjustment calculated for each month shall not exceed the forecasted monthly peak Operating Reserves multiplied by the difference between (i) the historic percentage of Operating Reserves met by Flexible RA Capacity and (ii) the percentage calculation that results from dividing the quantity determined in Section 40.10.1.3(3) by the forecasted monthly peak Operating Reserves.

\* \* \*

#### 40.10.2.1 Calculation of LRA Allocations

- (a) **Allocation of Maximum Three-Hour Net-Load Ramp.** The CAISO will calculate the Local Regulatory Authority's allocable share of the Flexible Capacity Need as the average of the sum of its jurisdictional Load Serving Entities' change in load, minus the change in wind output, minus the change in solar PV output, minus the change in solar thermal output during the five highest three-hour net-load changes in the month.
- (b) **Allocation of MSSC or Forecasted Peak Load.** The CAISO will determine the higher of the most severe single contingency or 3.5 percent of forecasted peak load for each Load Serving Entity based on the respective Load Serving Entity's peak load ratio share, and calculate each Local Regulatory Authority's allocable share based on the sum of its jurisdictional Load Serving Entities' shares.
- (c) **Allocation of Forecast Adjustment.** If the CAISO includes a forecast adjustment in its draft study results, it will allocate the forecast adjustment using the same methodology set forth in Section 40.10.2.1(b)~~include an explanation of the cause and allocation of the~~

~~changed need in its Flexible Capacity Needs Assessment for review as part of the stakeholder process under Section 40.10.1.1.~~

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#### **40.10.3.2 Flexible Capacity Category-- Base Ramping Resources**

- (a) **Resource Criteria.** Base ramping resources must meet all of the following criteria, except as provided in Sections 40.10.3.2(b) and (c) --
- (1) The resource must be capable of providing Flexible RA Capacity to the CAISO Markets through Economic Bids for Energy and Economic Bids for Ancillary Services that are not flagged as Contingency Only in the Day-Ahead Market, if and to the extent the resource is certified to provide Ancillary Services, submitted daily for the 17-hour period from 5:00 a.m. through 10:00 p.m.;
  - (2) The resource must be capable of providing Energy for a minimum of six hours up to its full Effective Flexible Capacity value including PMin;
  - (3) The resource must be capable of being available seven days a week;
  - (4) The resource must be able to provide the minimum of (i) two Start-Ups per day for every day of the month or sixty Start-Ups per month, or (ii) the number of Start-Ups allowed by its operational limits, including minimum up and minimum down time; and
  - (5) The resource must not have annual or monthly limitations on the number of Start-Ups or the amount of energy produced that, on a daily basis, are lower than the requirements in Section 40.10.3.2(a)(1) through (4).
- (b) **Use-Limited Resource**
- (1) A Use-Limited Resource may be included in this category if it meets the criteria in Section 40.10.3.2(a), except that use-limited resources providing Flexible RA Capacity are not required to submit bids for Ancillary Service bids in the Day-Ahead Market.
  - (2) A Load Serving Entity may include in this category a combined resource consisting of two Use-Limited Resources that do not individually meet the

minimum operational and availability requirements but in combination meet the criteria in Section 40.10.3.2(a).

- (3) The Flexible RA Capacity amount for the combined resource will be less than or equal to the lowest Effective Flexible Capacity value shown on the Resource Flexible RA Capacity Plan for a resource in the combination.
  - (4) Both resources in the combination shall be subject to the must-offer obligation up to their Flexible RA Capacity amounts.
- (c) **Non-Generator Resource.** A Non-Generator Resource that elects to provide Flexible RA Capacity may be included in this category if it meets the criteria in Section 40.10.3.2(a). A Non-Generator Resource that elects to provide Flexible RA Capacity and Regulation Energy Management is not eligible to be included in this category.

#### **40.10.3.3 Flexible Capacity Category -- Peak Ramping Resources**

- (a) **Resource Criteria.** Peak ramping resources must meet all of the following criteria, except as provided in Sections 40.10.3.3(b) and (c) --
- (1) The resource must be capable of providing Flexible RA Capacity to the CAISO Markets through Economic Bids for Energy and Economic Bids for Ancillary Services that are not flagged as Contingency Only in the Day-Ahead Market, if and to the extent the resource is certified to provide Ancillary Services, which must be submitted daily for a five-hour period to be determined by the CAISO on a seasonal basis;
  - (2) The resource must be capable of providing Energy for a minimum of three continuous hours up to its full Effective Flexible Capacity value including PMin;
  - (3) The resource must be capable of being available seven days a week.
  - (4) The resource must be capable of at least one Start-Up per day; and
  - (5) The resource must not have annual or monthly limitations on the number of unit Start-Ups or the amount of energy produced that, on a daily basis, are lower than the requirements in Section 40.10.3.3(a)(1) through (4).
- (b) **Use-Limited Resource.**

(1) A Use-Limited Resource may be included in this category if it meets the criteria in Section 40.10.3.3(a), except that use-limited resources providing Flexible RA Capacity are not required to submit bids for Ancillary Service bids in the Day-Ahead Market.

(2) A Load Serving Entity may include in this category a combined resource consisting of two Use-Limited Resources that do not individually meet the minimum operational and availability requirements but in combination meet the criteria in Section 40.10.3.3(a).

(3) The Flexible RA Capacity amount for the combined resource will be less than or equal to the lowest Effective Flexible Capacity value shown on the Resource Flexible RA Capacity Plan for a resource in the combination.

(4) Both resources in the combination shall be subject to the must-offer obligation up to their Flexible RA Capacity amounts.

(c) **Non-Generator Resource.** A Non-Generator Resource that elects to provide Flexible RA Capacity may be included in this category if it meets the criteria in Section 40.10.3.3(a). A Non-Generator Resource that elects to provide Flexible RA Capacity and Regulation Energy Management is not eligible to be included in this category.

(d) **Base Ramping Resource.** A resource that meets the qualifications of the Flexible Capacity Category for base ramping resources also qualifies to be included in this category as a peak ramping resource; however, a resource that meets only the qualifications of a peak ramping resource does not qualify as a base ramping resource.

#### **40.10.3.4 Flexible Capacity Category -- Super-Peak Ramping Resources.**

(a) **Resource Criteria.** Super-peak ramping resources must meet all of the following criteria, except as provided in Sections 40.10.3.4(b), (c) and (d) --

(1) The resource must be capable of providing Flexible RA Capacity to the CAISO Markets through Economic Bids for Energy and Economic Bids for Ancillary Services Bids that are not flagged as Contingency Only in the Day-Ahead Market, if and to the extent the resource is certified to provide Ancillary Services,

which must be submitted each weekday that is not holiday, for a five-hour period to be determined by the CAISO on a seasonal basis;

- (2) The resource must be capable of providing Energy for a minimum of three continuous hours up to its full Effective Flexible Capacity value including PMin;
- (3) The resource must be capable of being available on weekdays that are not holidays, as defined in the Business Practice Manual;
- (4) The resource must be capable of at least one Start-Up per day; and
- (5) The resource must be capable of responding to at least five CAISO dispatches per month, during the five-hour period of the must offer obligation, for the resource to Start-Up.

(b) **Use-Limited Resource.**

- (1) A Use-Limited Resource may be included in this category if it meets the criteria in Section 40.10.3.4(a), **except that use-limited resources providing Flexible RA Capacity are not required to submit bids for Ancillary Service bids in the Day-Ahead Market.**
- (2) A Load Serving Entity may include in this category a combined resource consisting of two Use-Limited Resources that do not individually meet the minimum operational and availability requirements but in combination meet the criteria in Section 40.10.3.4(a).
- (3) The Flexible RA Capacity amount for the combined resource will be less than or equal to the lowest Effective Flexible Capacity value shown on the Resource Flexible RA Capacity Plan for a resource in the combination.
- (4) Both resources in the combination shall be subject to the must-offer obligation up to their Flexible RA Capacity amounts.

(c) **Non-Generator Resource.** A Non-Generator Resource may be included in this category if it meets the criteria in Section 40.10.3.4(a) and is not registered in the CAISO's Master File as a Regulation Energy Management resource.

(d) **Non-Generator Resource, Regulation Energy Management.** A Non-Generator

Resource that is a Regulation Energy Management resource may be included in this category if it meets the following criteria --

- (1) The resource must be capable of providing Regulation Energy Management to the CAISO Markets through Economic Bids for Regulation Up and Regulation Down submitted daily for a 17-hour period from 5:00 a.m. through 10:00 p.m.;
- (2) The resource shall not submit bids to provide Energy;
- (3) The resource must be capable of being available seven days a week;
- (4) The resource must be capable of unlimited Start-Ups per day; and
- (5) The resource must be registered as a Non-Generator Resource providing Regulation Energy Management in the CAISO's Master File.

- (e) **Base Ramping and Peak Ramping Resources.** A resource that meets the qualifications of the Flexible Capacity Category for base ramping resources or peak ramping resources also qualifies to be included in this category as a super-peak ramping resource; however, a resource that meets only the qualifications of a super-peak ramping resource does not qualify as a base ramping resource or a peak ramping resource.

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#### **40.10.4.1 Effective Flexible Capacity Calculation**

- (a) **Flexible Resources.** The CAISO will calculate the Effective Flexible Capacity value of a resource, for use (i) if a Local Regulatory Authority has not established criteria for calculating the Effective Flexible Capacity value for eligible resource types, and (ii) for determining if a cumulative deficiency exists under Sections 43.2.7(a) and (b), as follows, except as provided in Sections 40.10.4.1 (b) through (f) --

- (1) If the Start-Up Time of the resource is greater than 90 minutes, the Effective Flexible Capacity value shall be the weighted average ramp rate of the resource calculated from PMin to Net Qualifying Capacity multiplied by 180 minutes. The Effective Flexible Capacity shall not exceed the difference between the PMin and PMax of the resource.

- (2) If the Start-Up Time of the resource is less than or equal to 90 minutes, the Effective Flexible Capacity value shall be the weighted average ramp rate of the resource calculated from zero to Net Qualifying Capacity multiplied by 180 minutes. The Effective Flexible Capacity shall not exceed the Net Qualifying Capacity of the resource.
- (b) **Hydroelectric Generating Unit.** The Effective Flexible Capacity of a hydroelectric generating unit will be the amount of capacity from which the resource can produce Energy consistently for 6 hours based upon the resource's physical storage capacity, which shall not exceed its Net Qualifying Capacity.
- (c) **Proxy Demand Response Resource.** The Effective Flexible Capacity of a Proxy Demand Response Resource will be based on the resource's actual MWs of load modification in response to a dispatch by the CAISO during a test event. In determining the Effective Flexible Capacity of a Proxy Demand Response Resource, the CAISO will --
  - (1) conduct the test at a random time during the flexible capacity must-offer obligation period for the resource;
  - (2) use the baseline load data, as described in the CAISO Tariff or Business Practice Manual, to measure the load modification for the Proxy Demand Response Resource being tested; and
  - (3) pay the resource's bid price for the testing period.
- (d) **Energy Storage Resource.** The Effective Flexible Capacity value for an energy storage resource will be determined as follows --
  - (1) for an energy storage resource that provides Flexible RA Capacity but not Regulation Energy Management, the Effective Flexible Capacity value will be the MW output range the resource can provide over three hours of charge/discharge while constantly ramping.
  - (2) for an energy storage resource that provides Flexible RA Capacity and Regulation Energy Management, the Effective Flexible Capacity value will be the resource's 15-minute energy output capability.



- (e) **Multi-Stage Generating Resource.** The Effective Flexible Capacity value for a Multi-Stage Generating Resource will be calculated using the longest Start-Up Time of the resource's configuration that has the lowest PMin.
- (f) **Combined Heat and Power Resource.** The Effective Flexible Capacity value of a Combined Heat and Power Resource will be the lesser of (i) the resource's Net Qualifying Capacity, or (ii) the MW difference between the CHP resource's maximum output and ~~the its~~ minimum ~~of either its~~ operating level, such quantity not to exceed the quantity of generating capacity capable of being delivered or its capability over a three-hour period.

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#### 40.10.5.1 LSE Flexible RA Capacity Plans

- (a) **Submission Requirement.** A Scheduling Coordinator must submit annual and monthly LSE Flexible RA Capacity Plans for each Load Serving Entity it represents; except that an annual plan for 2015 is not required. A Load-Following MSS is not required to submit annual or monthly LSE Flexible RA Capacity Plans.
- (b) **Annual Plan.** Each annual LSE Flexible RA Capacity Plan must –
- (1) demonstrate that the Load Serving Entity has procured for each month at least 90 percent of the annual Flexible RA Capacity requirement determined by the CAISO; or the amount of Flexible RA Capacity required by the Load Serving Entity's Local Regulatory Authority, if the Local Regulatory Authority has set such requirement;
  - (2) identify the resources the Load Serving Entity intends to rely on to provide the Flexible RA Capacity; and
  - (3) include all information and be submitted no later than the last Business Day in October, in accordance with the reporting requirements and schedule set forth in the Business Practice Manual.
- (c) **Monthly Plan.** The monthly LSE Flexible RA Capacity Plan must --
- (1) demonstrate that the Load Serving Entity procured 100 percent of the total

monthly Flexible RA Capacity requirement determined by the CAISO; or the monthly amount of Flexible RA Capacity required by the Local Regulatory Authority, if the Local Regulatory Authority has set such requirement;

- (2) include information for purposes of the validation under Section 40.10.5.3(a) and the evaluation for cumulative deficiency under Section 40.10.5.3(c)~~demonstrate~~ that shows the MW of Flexible RA Capacity the Load Serving Entity designates based on ~~met~~ the total monthly requirement determined by the CAISO within the minimum or maximum quantity, as applicable, for each Flexible Capacity Category; or only if the Local Regulatory Authority has established its own flexible capacity requirement, shows the MW of Flexible RA Capacity ~~that~~ the Load Serving Entity designates based on ~~has met~~ the total monthly requirement determined by the Local Regulatory Authority within the minimum or maximum quantity for each Flexible Capacity Category required by the Local Regulatory Authority, if applicable;
- (3) identify all resources the Load Serving Entity will rely on to provide the Flexible RA Capacity and for each resource specify the Flexible Capacity Category in which the Flexible RA Capacity will be provided; and
- (4) include all information and be submitted to the CAISO at least 45 days in advance of the first day of the month covered by the plan, in accordance with the reporting requirements and schedule set forth in the Business Practice Manual.

- (d) **Correction to Monthly Plan.** The Scheduling Coordinator for the Load Serving Entity may submit at any time from 45 days through 11 days in advance of the first day of the month covered by the plan, a revision to its monthly LSE Flexible RA Capacity Plan to correct an error in the plan. The CAISO will not accept any revisions to a monthly LSE Flexible RA Capacity Plan from 10 days in advance of the relevant month through the end of the month, unless the Scheduling Coordinator for the Load Serving Entity demonstrates good cause for the change and explains why it was not possible to submit the change earlier.

**40.10.5.6 LRA Deficiency.**

- (a) **Finding and Notification.** If the CAISO's evaluation under Section 40.10.5.3(c) finds a cumulative deficiency in Flexible RA Capacity, the CAISO will --
- (1) identify each Local Regulatory Authority that did not meet its allocable share of the Flexible Capacity Need using the cumulative amount of Flexible RA Capacity that the Local Regulatory Authority's jurisdictional Load Serving Entities included in their annual and monthly Flexible RA Capacity Plans in total and, for the monthly Flexible RA Capacity Plans, in each Flexible Capacity Category;
  - (2) identify each Load Serving Entity that (i) is subject to the jurisdiction of a Local Regulatory Authority that did not meet its allocable share of the Flexible Capacity Need under Section 40.10.5.6, and (ii) did not include sufficient Flexible RA Capacity in an annual or monthly plan to meet its allocated Flexible RA Capacity Requirement or did not meet the monthly requirement within the minimum or maximum quantity, as applicable, for each Flexible Capacity Category, based on the allocation methodology of the Local Regulatory Authority if it has established its own methodology for allocating the Flexible Capacity Need to its jurisdictional Load Serving Entities;
  - (3) notify each Local Regulatory Authority identified under Section 40.10.5.6(a)(1) and the Scheduling Coordinator for each Load Serving Entity identified under Section 40.10.5.6(a)(2) of the cumulative deficiency in an attempt to resolve any deficiency in accordance with the procedures set forth in the Business Practice Manual; and
  - (4) provide the notice at least 25 days in advance of the first day of the month covered by the plan and include the reasons the CAISO believes a cumulative deficiency exists.
- (b) **Resolved Deficiency.** If the CAISO provides a notice of cumulative deficiency under Section 40.10.5.6(a), and the deficiency is resolved, the Scheduling Coordinator for the

Load Serving Entity shall demonstrate, no less than 11 days prior to the first day of the month covered by the LSE Flexible RA Capacity Plan, that the identified deficiency is cured by submitting a revised LSE Flexible RA Capacity Plan.

- (c) **Unresolved Deficiency.** If the CAISO provides a notice of deficiency under Section 40.10.5.6(a) and is not advised that the deficiency is resolved, the CAISO will use the information contained in the Resource Flexible RA Capacity Plan to set the obligations of resources under Section 40.10 and/or to assign any costs incurred under this Section 40 and Section 43.

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#### **40.10.6.1 Day-Ahead and Real-Time Availability**

- (a) **Must-Offer Obligation.** The Scheduling Coordinator for a resource supplying Flexible RA Capacity must submit Economic Bids for Energy for the full amount of the resource's Flexible RA Capacity, and Economic Bids for Ancillary Services that are not flagged as Contingency Only in the Day-Ahead Market for the full amount of the resource's Flexible RA Capacity that is certified to provide Ancillary Services, in the Day-Ahead Market and the Real-Time Market for the applicable Trading Hours that is capable of being economically dispatched as follows, except as provided in Section 40.10.6.1(e) through(h) --
- (1) Flexible Capacity Category for base ramping resources - the 17-hour period from 5:00 a.m. to 10:00 p.m., seven days a week;
  - (2) Flexible Capacity Category for peak ramping resources - the five-hour period determined for each season by the CAISO's Flexible Capacity Needs Assessment, seven days a week; and
  - (3) Flexible Capacity Category for super-peak ramping resources – the five-hour period determined for each season by the CAISO's Flexible Capacity Needs Assessment, weekdays, except holidays and as provided in Section 40.10.6.1(h), until the resource receives during the five-hour period of the must offer obligation and responds to five CAISO dispatches for Start-Up during the month, after

which the resource will not be subject to a must-offer obligation as a super-peak ramping resource for the remainder of that month; however, any other must-offer obligations for Resource Adequacy Capacity will still apply.

- (b) **Availability Requirement.** During the period of the applicable must-offer obligation, a Flexible RA Capacity Resource must be operationally available except for limitations specified in the Master File, legal or regulatory prohibitions or as otherwise required by this CAISO Tariff or by Good Utility Practice.
- (c) **Co-optimization.** Through the IFM co-optimization process, the CAISO will utilize available Flexible RA Capacity to provide Energy or Ancillary Services in the most efficient manner to clear the Energy market, manage congestion and procure required Ancillary Services.
- (d) **Participation in RUC.** A Flexible RA Capacity Resource must participate in the RUC to the extent that the resource has available Flexible RA Capacity that is not reflected in an IFM Schedule. Resource Adequacy Capacity participating in RUC will be optimized using a zero dollar (\$0/MW-hour) RUC Availability Bid. Flexible RA Capacity selected in RUC will not be eligible to receive a RUC Availability Payment.
- (e) **Use-Limited Resources.** A Use-Limited Resource providing Flexible RA Capacity must be capable of responding to Dispatch Instructions and, consistent with its use-limitations, must submit Economic Bids for Energy for the full amount of its Flexible RA Capacity, ~~and Economic Bids for Ancillary Services that are not flagged as Contingency Only in the Day-Ahead Market for the full amount of its Flexible RA Capacity that is certified to provide Ancillary Services,~~ in the Day-Ahead Market and the Real-Time Market for the Trading Hours applicable to the resource's Flexible Capacity Category for that month for the Trading Hours that it is capable of being economically dispatched.
- (f) **Short, Medium or Long Start Units.**
  - (1) Short Start Units or Medium Start Units providing Flexible RA Capacity that do not have an IFM Schedule or a RUC Schedule for any of their Resource Adequacy Capacity for a given Trading Hour are required to participate in the

Real-Time Market consistent with the provisions in Section 40.6.3 that apply to Short Start Units providing RA Capacity.

- (2) Long Start Units providing Flexible RA Capacity that do not have an IFM Schedule or a RUC Schedule for any of their Resource Adequacy Capacity for a given Trading Hour are required to participate in the Real-Time Market consistent with the provisions in Section 40.6.7 that apply to Long Start Units providing RA Capacity.
- (3) If availability is required under Section 40.6.3 or 40.6.7, the Scheduling Coordinator for the resource must submit to the RTM for that Trading hour for which the resource is capable of responding to Dispatch Instructions: (i) Energy Bids for the full amount of the available Flexible RA Capacity, including capacity for which it has submitted Ancillary Services Bids; and (ii) Ancillary Services Bids for the full amount of its Flexible RA Capacity that is certified to provide Ancillary Services, and for each Ancillary Service for which the resource is certified, including capacity for which it has submitted Energy Bids.
- (g) **Extremely Long-Start Resources.** Flexible RA Capacity Resources that are Extremely Long-Start Resources must be available to the CAISO by complying with the Extremely Long-Start Commitment Process under Section 31.7 or otherwise committing the resource upon instruction from the CAISO, if physically capable. Once an Extremely Long-Start Resource is committed by the CAISO, it is subject to the provisions of Section 40.10.6 regarding Day-Ahead Availability and Real-Time Availability for the Trading Days for which it was committed.
- (h) **Non-Generator Resources, Regulation Energy Management.** Non-Generator Resources providing Flexible RA Capacity and Regulation Energy Management must submit Bids for Regulation Up and Regulation Down for Trading Hours in the 17-hour period from 5:00 a.m. to 10:00 p.m., seven days a week and shall not submit Bids for Energy or other Ancillary Services.

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#### **43.4 Selection Of Eligible Capacity Under The CPM**

In accordance with Good Utility Practice, the CAISO shall make designations of Eligible Capacity as CPM Capacity or CPM Flexible Capacity under Section 43.1 by applying the following criteria in the order listed:

- (1) the effectiveness of the Eligible Capacity at meeting the designation criteria specified in Section 43.2;
- (2) the capacity costs associated with the Eligible Capacity;
- (3) the quantity of a resource's available Eligible Capacity, based on a resource's PMin, relative to the remaining amount of capacity needed;
- (4) the operating characteristics of the resource, such as dispatchability, Ramp Rate, and load-following capability;
- (5) whether the resource is subject to restrictions as a Use-Limited Resource; and
- (6) for designations under Section 43.2.3, the effectiveness of the Eligible Capacity in meeting local and/or zonal constraints or other CAISO system needs.

In applying these selection criteria, the goal of the CAISO is to designate lower cost resources that will be effective in meeting the reliability needs underlying the CPM designations. In making this determination, the CAISO will apply the first criterion to identify the effective Eligible Capacity by considering the effectiveness of the resources at meeting the designation criteria for the type of CPM to be issued and at resolving the underlying reliability need. The CAISO will apply the second criterion by considering the cost of the effective Eligible Capacity. The CAISO will endeavor to designate a resource at the CPM Capacity price determined in accordance with Section 43.67.1 before selecting a resource with a higher unit-specific CPM Capacity price specified under Section 43.67.2. The CAISO will endeavor to designate resources that have specified a capacity price before designating resources that have not specified a CPM Capacity price under Section 43.67.2.1. The CAISO will apply the third criterion by considering the quantity of a resource's Eligible Capacity. The CAISO will endeavor to select a resource that has a PMin

at or below the capacity that is needed to meet the reliability need before selecting a resource that has a PMin that would result in over-procurement. The CAISO will apply the fourth criterion by considering specific operating characteristics of a resource, such as dispatchability, ramp rate, and load-following capability to the extent that such characteristics are an important factor in resolving the reliability need. The CAISO will apply the fifth criterion by considering whether a resource is use-limited and whether that status may restrict its ability to be available to the CAISO in the Day-Ahead Market and Real-Time Market throughout the period for which it is being procured. To the extent that use-limited resources are capable of performing the required service for the duration of the CPM designation, the CAISO will not unduly discriminate in favor of non-Use Limited resources when applying the selection criteria. The CAISO will apply the sixth criterion by considering the effectiveness of the Eligible Capacity to meet local and/or zonal constraints or other CAISO system needs for CPM designations under 43.2.3. If after applying these criteria, two or more resources that are eligible for designation equally satisfy these criteria, the CAISO shall utilize a random selection method to determine the designation between those resources.

While the CAISO does not have to designate the full capability of a resource, the CAISO may designate under the CPM an amount of CPM Capacity from a resource that exceeds the amount of capacity identified to ensure compliance with the Reliability Criteria set forth in Section 40.3 due to the PMin or other operational requirements/limits of a resource that has available capacity to provide CPM service. The CAISO shall not designate the capacity of a resource for an amount of capacity that is less than the resource's PMin.

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## Appendix A

### Master Definition Supplement

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#### - Flexible RA Capacity

~~The Flexible Capacity of a resource listed on an with-an-obligation-to-provide-SE Flexible RA Capacity Plan and a Resource Flexible RA Capacity Plan during a resource adequacy month.~~



