

Staff Proposal on the Implementation of the Flexible Capacity Procurement Framework

By: CPUC Energy Division Staff

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Section I. Background

The California Public Utilities Commission (“CPUC”) and the California Independent System Operator (“ISO”) agree that securing operational flexibility is critical due to the increasing influx of intermittent supply resources and changing load patterns. The CPUC’s Long Term Procurement and Planning (“LTPP”) and Resource Adequacy (“RA”) Proceedings are the primary mechanisms that ensure California’s investor owned utilities (“IOUs”) and energy service providers (“ESPs”) have adequate generation capacity. The RA process requires load-serving entities (“LSEs”) to demonstrate that they have procured sufficient generation capacity to meet the upcoming year’s forecast demand. The objective of the flexible RA procurement initiative is to ensure that LSEs purchase capacity from generators with suitable operational characteristics and make this capacity operationally available to the ISO by economically bidding in these resources in the ISO day-ahead and real time markets.

Decision (“D.”)12-06-025 directed parties to define “flexibility” and develop implementation details for incorporating flexible capacity in the 2014 RA program. As part of the directive, the ISO and two of the three IOUs submitted a proposal, “Resource Adequacy and Flexible Capacity Procurement Joint Parties’ Proposal” (“Joint Proposal”) on October 29, 2012 to the Energy Division. The Joint Proposal recommended that the Commission establish a monthly “flexible capacity procurement” requirement among LSEs. D.13-06-024 adopted an interim flexible capacity framework for the years 2014-2017. The Decision adopted flexible capacity targets for LSEs in 2014 with direction to adopt flexible capacity requirements in 2015. The Decision further outlined certain tasks that needed to be completed to enforce flexible capacity requirements on LSEs. In this staff proposal, Energy Division staff (“staff”) proposes a compliance framework for future flexible capacity obligations starting in 2015 compliance year.

The ISO initiated its own stakeholder process and issued a series of straw proposals to propose additions to ISO tariff essential to the implementation of the flexible RA framework. Staff has relied on the February 7, 2014 version of the ISO “Flexible Resource Adequacy Criteria and Must-offer Obligation” straw paper (“FRAC-MOO proposal”) for information

used in this proposal.

Section II. Flexible capacity need and allocation

D.13-06-024 recognized a need for flexible capacity in the RA fleet and defined flexible capacity need: “Flexible capacity need” is defined as the quantity of economically dispatched resources needed by the California ISO to manage grid reliability during the greatest three-hour continuous ramp in each month. Resources will be considered as “flexible capacity” if they can sustain or increase output, or reduce ramping needs, during the hours of “flexible need.” (D 13-06-024, page 2). The Decision adopted the following formula to calculate system flexibility requirement:

$$\text{Flexibility Need}_{MTH_y} = \text{Max} [(3RRHR_x) MTH_y] + \text{Max}(MSSC, 3.5\% * E(PL_{MTH_y})) + \epsilon$$

Where,

$\text{Max} [(3RRHR_x) MTH_y]$ = Largest three hour continuous ramp starting in hour x for month y

$E(PL)$ = Expected peak load

MTH_y = Month y

$MSSC$ = Most Severe Single Contingency

ϵ = annually adjustable error term to account for uncertainties such as load following (This term was zero in 2014 and is currently being determined in the ISO FRAC- MOO stakeholder proceeding. Parties may include a potential cap for the error term in response to this proposal and/or submit comments to the error term as a response to vetting the flexible capacity studies as detailed further in Section 3.)

As per the FRAC-MOO proposal, the ISO proposes to allocate to the CPUC a flexible requirement, which consists of the aggregate of ISO- determined individual CPUC jurisdictional LSE flexible obligations. The ISO proposes to use causation principles to allocate flexible obligations to Local Regulatory Authorities (“LRAs”) as the CPUC. Specifically, “The ISO will allocate the proportion of the system flexible capacity requirement to each LRA based on its jurisdictional LSEs’ contribution to the ISO’s largest 3 hour net-load ramp change each month. The ISO will calculate each LSE’s contribution to

the net-load change using historic changes in load and forecasted changes in wind output and solar output, and distributed generation. “(FRAC-MOO proposal, Section 2, page 5) In the July 2, 2013 staff comments to the FRAC-MOO straw proposal, staff indicated that it does not support this allocation methodology, as it does not reflect causation accurately.¹ Staff supports an approach where inflexible generation, including all baseload units, and not just wind and solar generation resources bear the cost of flexibility. Therefore, staff does not propose to extend the ISO proposed allocation methodology to CPUC jurisdictional LSEs. According to the FRAC-MOO proposal, the ISO will allocate CPUC the total aggregate obligations for all its jurisdictional LSEs and staff proposes to allocate flexibility to CPUC jurisdictional LSEs based on load-ratio share of CEC forecasted ISO coincident peak.

The ISO intends to follow the CPUC allocation methodology when allocating flexible capacity resource adequacy backstop costs in the event of a shortfall in procurement or operation of flexible generation. Specifically, “If a LRA allocates the flexible capacity requirement to its jurisdictional LSEs using a different allocation methodology, then the ISO will use that LRA’s allocation methodology when allocating backstop costs in the event that there is a flexible capacity shortfall by one or more of the LRAs load serving entities.” (FRAC-MOO proposal, Section 5, page 17). For the 2015 RA year, staff proposes to use load-ratio share to allocate flexibility among LSEs. In the future, we intend to explore other methods of allocation based on causation through the RA proceeding, potentially in conjunction with staff’s analysis of reliability needs. An LSE’s flexible procurement obligation is calculated as follows, consistent with how system and local RA requirements are allocated.

LSE monthly flexible capacity procurement obligation= [(LSE monthly coincident peak load)/ (ISO monthly coincident peak load)]* Cumulative monthly flexible capacity requirement.

¹ <http://www.caiso.com/Documents/CPUC-Comments-FlexibleResourceAdequacyCriteriaMustOfferObligationsRevisedStrawProposal.pdf>

Section III. Flexible capacity requirements study

The ISO is expected to calculate the three-hour ramp need using a one-in-two year load forecast and estimate the largest three-hour ramp for each month. The need will be determined for the forward year. The ISO has initiated a stakeholder process to solicit stakeholder input for assessing flexibility needs.² By May 1 of each year, the ISO will complete and file in the RA proceeding, a flexible capacity requirements (“FCR”) study together with the Local Capacity Requirements (“LCR”) study, which lists flexible capacity needs for each month of the following year. Parties to the RA proceeding will vet the studies and submit comments to the CPUC. The annual RA decision will then adopt final study results, which consists of total monthly flexible obligations for CPUC LSEs along with the LCR. The timeline of this study process will mirror that of the current LCR schedule.

Section IV. What qualifies as flexible capacity?

In order to qualify as a flexible resource, the resource must meet the following criteria:

1. A resource must qualify as an RA resource and have a qualifying capacity (“QC”) in order to have an EFC
2. A resource must be able to ramp and sustain energy output for a minimum of three hours

Section V. Counting conventions

Specific counting conventions apply to determine the Effective Flexible Capacity (“EFC”) of resources relative to a resource’s Net Qualifying Capacity (“NQC”). The EFC reflects the flexibility of a resource that can be counted towards an LSE’s flexible RA obligations.

The proposed counting conventions for EFC applicable in 2015 are listed below:

Dispatchable thermal resources

- If start-up time of resource is greater than 90 minutes then EFC is limited to the MW range between Pmin and NQC as limited by ramp rate.

² <http://www.caiso.com/informed/Pages/StakeholderProcesses/FlexibleCapacityRequirements.aspx>

EFC = minimum of (NQC - Pmin) or (180 min * RRavg)

Where: RRavg = average between Pmin and NQC.

- If start-up time of resource is less than or equal to 90 minutes then EFC is limited to the MW range between zero and NQC as limited by start-up time and ramp rate.

EFC = minimum of (NQC) or (Pmin + (180 min - SUT) * RRavg)

Where: SUT = Longest (cold) RDT start-up time in minutes.

Cold start-up time is the highest value in the startup time segments for the resource.

RRavg = average between Pmin and NQC.

Hydro resources

A hydro resource will qualify as flexible if it has the physical storage capacity to provide energy for up to Pmax for six hours. A hydro resource will be permitted to designate an EFC value annually for each month of a counting year. The proposed EFC shall not exceed the NQC or the Pmax of the hydro resource.

Storage and demand response

Please refer to staff proposal “*Qualifying Capacity and Effective Flexible Capacity Calculation Methodologies for Energy Storage and Supply-Side Demand Response*” issued on January 16, 2014.

Combined Heat and Power Facilities A Combined Heat and Power (“CHP”) resource will be permitted to designate an EFC value annually for each month of a counting year to reflect its unique operating requirements related to industrial host obligations or CHP contract limitations. The EFC should not exceed the NQC of the unit.

Section VI Effective flexible capacity list

The CPUC and ISO will develop and post a draft listing the effective flexible capacity amount for each participating dispatchable resource (“EFC list”) which passes a threshold test. The test requires the resource to have placed at least one economic bid in the real-time market for ten or more days in the previous calendar year. If the resource passes this test, then its EFC is calculated using the relevant counting conventions.³ Newly constructed resources are

³ FRAC-MOO proposal, Section 4, page 13

exempt from this test during the first calendar year of operation. Mirroring the current NQC list process, the ISO is expected to issue a draft EFC list in May. Generators may request modifications or additions to these lists and by sending these requests to the CPUC and ISO. Generators may refer to the CPUC RA Guide for further details. The ISO and CPUC will issue the final EFC list for CPUC jurisdictional LSEs by September. Staff recommends combining the EFC list with the NQC list for administrative ease.

Section VII. RA showings and validation

Staff will send each LSE its flexible capacity obligation along with the system and local RA requirements in July of 2014 for the 2015 compliance year.. Demand response programs are not listed on the EFC list but will be allocated to the LSE by the Energy Division. LSEs must use NQC to satisfy system and local RA obligations. The EFC and NQC of a resource are distinct numbers, and may not be used interchangeably. Each load serving entity shall make a 1) year-ahead, and 2) month-ahead showing of flexible capacity for each month of the compliance year. In the showing an LSE must submit the committed flexible capacity it has contracted for the compliance period to meet its flexible RA obligation. The LSE is not required to commit additional flexible capacity beyond its flexible RA obligation. A committed flexible resource is a qualified flexible resource under contract to perform under the applicable flexible must-offer obligation. In order to verify the committed flexible capacity that is being shown in the RA filing, staff will compare LSE RA filings against the generator's corresponding supply plan filed with the ISO. Validation of each LSE's flexible capacity obligation supplements the validation of RA filings against local and system RA obligations. Year-ahead compliance filings should demonstrate that 90% of flexible capacity obligation is met for January to December. Month-ahead filings need to demonstrate that 100% of flexible capacity obligation is met for the month.

A megawatt of capacity counts only once – as flexible or generic. A resource may have flexible megawatts and generic megawatts based on its start-up time and how it was contracted to the LSE. Flexible megawatt and generic megawatt count towards system RA

obligation. Only flexible megawatts count towards meeting flexible RA obligation. If the resource is in a local area, the combined total MW contracted from the facility count towards system and local RA requirements. For example, an LSE contracts with a resource with an NQC of 200 MW, a Pmin of 50 MW, and an EFC of 150 MW in a local area. The LSE can make the following RA showing if it contracts all the capacity within a resource including both flexible and generic.

System RA	Local RA	Flexible RA
200 MW	200 MW	150 MW

Staff recognizes that there may be instances where an LSE may be deficient in flexible capacity but not generic capacity. Staff does not propose to change the counting convention as defined in Section IV. However, for RA showing purposes the EFC of a resource committed by an LSE may be greater than, equal to, or less than the NQC committed for that resource. The committed EFC will bear obligations under the flexible must-offer obligation as specified by the ISO tariff. The NQC of a resource will bear obligations under the resource adequacy must-off obligations as specified by the ISO tariffs for generic capacity. LSE are expected to adhere to the principals of least cost best fit. .

Section VIII. Sale and purchase of flexible capacity

The sale of flexible capacity will entail an enhanced must-offer obligation and a potentially higher cost to a resource owner due to potential increases in wear and tear on a facility due to cycling. Therefore, a resource owner will have discretion in the sale of generic and flexible capacity. A resource must submit economic bids into the ISO’s day-ahead and real time markets for the committed flexible portion of the facility’s operating range. A megawatt may be sold only once as either flexible or inflexible. A resource owner may sell the flexible and inflexible capacity in separate transactions and to different purchasers. A resource owner may elect to sell any portion of qualified flexible capacity as inflexible. A resource owner with a resource consisting of both “generic” capacity (below Pmin) and “flexible” capacity, may elect to, or not to, sell the generic capacity prior to

selling the flexible portion capacity.

For example an LSE contracts with a resource with an NQC of 200 MW and a Pmin of 50 MW. The resource owner could:

1. Sell the entire 200 MW as generic capacity
2. Sell (or not sell) up to 50 MW as generic and sell up to 150 MW as flexible. (In either case, the scheduling coordinator would still have to bid or self-schedule the 50 MW generic capacity
3. Sell up to 200 MWs in any of the above combinations to different purchasers.

Flexible Capacity, local capacity and system capacity are distinct RA products that need to be distinguished in Request for Offers and bilateral contracts to purchase or sell RA capacity for investor-owned utilities (“IOUs”). In order to avoid over procurement, an IOU must try to commit flexible resources towards meeting flexible, system and local RA requirements concurrently. We expect IOUs to employ prudent procurement and follow the rules of least cost best fit. However, an LSE’s generic and flexible obligations will be examined separately. Each generic RA MW committed by an LSE in its RA showing as generic RA counts toward that LSE’s generic RA obligation, and each flexible RA MW of a resource committed by an LSE in its RA showing as flexible RA counts toward its flexible RA obligation. We expect LSEs to employ procurement and showing practices that maximize efficiency and avoid any excess procurement.

Section IX. Penalties

The current penalties applicable to system RA deficiencies will apply to flexible RA deficiencies. D.11-06-022 modified the penalty structure of the RA program, changing both the penalties applicable under Resolution E-4195 as well as the other penalties of the program. D.11-06-022 eliminated the penalty for small procurement deficiencies, and instead created a Specified Violation for any procurement deficiency remedied within five business days. For those deficiencies not cured within five business days, the other penalties adopted in D.10-06-036 continue to apply. The penalty structure follows.

Table-1

	Deficiency in Flexible RA Filing (Modifying Appendix A in
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	Resolution E-4195)
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Deficiency cured within five business days from the date of notification by the Energy Division	\$5,000 per incident if the deficiency is 10 MW or smaller, \$10,000 for a deficiency larger than 10 MW. For the second and each subsequent deficiency in any calendar year, penalties will be \$10,000 per incident if the deficiency is 10 MW or smaller, \$20,000 for a deficiency larger than 10 MW.
Replaced after five-business days from the date of notification or not replaced	\$6.66/kW-month

Section X. Use-limited flexible resources

D.13-06-024 directed staff and parties to develop rules regarding use-limited resources. Staff organized a workshop on October 15, 2013, which among other things included a discussion on use-limited resources.

Use-limited resources can be classified as resources that can run in all or most hours, but are limited in the total starts or hours they can run; or resources that cannot offer in certain hours (excluding outages). This includes but is not limited to, thermal units limited by starts or emissions, demand response, hydro resources, storage, and variable energy resources (“VERs”). Flexible use-limited resources must be operationally capable of ramping or sustaining output for three continuous hours.

Since all use-limited resources do not have the same use characteristics, it becomes challenging to count flexibility within the resource constrained by different use limitations. D.13-06-024 adopted counting conventions for hydro resources and staff is working on developing a methodology to count flexibility within storage and demand response.⁴³

⁴ See staff proposal “Qualifying Capacity and Effective Flexible Capacity Calculation Methodologies for Energy

However, many dispatchable gas-fired resources that the ISO relies on to meet flexible reliability requirements are subject to environmental use-limitations and start up limitations. Through the workshop and various party comments, staff explored various alternatives for the management of use-limited resources. In informal comments several parties expressed different strategies to manage use-limited resources.

1. Distributed Energy Consumer Advocates (“DECA”) presentations from the October 15, 2013 workshop suggest an approach for counting use-limited resources for purposes of satisfying flexible RA capacity requirement called the “Flexibility Duration Curve Proposal.” The DECA proposal focuses on a proposed CPUC compliance program that allocates flexible capacity based on expected performance under different flexibility duration curves. The “bucket approach” would define various buckets of the amount each bucket can be used to fulfill flexible RA capacity procurement requirements.
2. Calpine supports the “partial counting approach” which would require all flexible RA capacity resources to meet the same energy and availability requirements, and allow use-limited resources to count partially towards flexible RA procurement requirements in a manner that reflects their use limits.
3. In the FRAC-MOO proposal, the ISO creates categories to contain use- limited flexible resources and include provisions to create these categories in its tariff. The proposed buckets are based on run time, number of starts a day, and duration of the must-offer obligation. The buckets impose limits on use-limited resources in an LSE’s flexible resource portfolio.

Interim Approach

After considering various approaches, staff supports an approach where requirements and any caps or limitations on use-limited resources are based on the operational characteristics of the resource. Staff shares the ISO’s concern over managing a flexible fleet that has an over-reliance on use-limited resources. We also appreciate the ISO’s efforts in creating categories that allow the participation of use-limited preferred resources in the

Storage and Supply-Side Demand Response Resources” ” issued on January 16, 2013.

flexible capacity procurement framework. However, we hesitate to recommend incorporating complex restrictions on use-limited resources on a long term basis due to other parallel proceedings at the CPUC and the ISO to implement the Joint Reliability Framework.

On January 28, 2013 the ISO issued the “Reliability Services Initiative.” Specifically, among other things the ISO proposes that the scope of this initiative include: enhancing the minimum eligibility criteria for system, local, and flexible RA capacity where needed and modifying must-offer rules where required, in particular for use-limited resources, in order to standardize must-offer requirements for different technology types, as is feasible.⁵ On February 5, the CPUC issued the “Order Instituting Rulemaking” which considers forward multi-year RA requirements, implementation of a planning assessment, and determining rules and Commission policy position with respect to the ISO’s market-based backstop procurement mechanism. Both of these initiatives will have a significant impact on flexible RA procurement. Therefore, we propose to institute an interim approach to end on or before December 31, 2017.

The FRAC-MOO proposal recommends four flexible capacity procurement categories with corresponding minimum and maximum procurement targets, as well as different must-offer obligations for each category. In response to the FRAC-MOO proposal, PG&E submitted comments and recommended that the CAISO simplify its four-category framework to two categories or types.⁶ As an interim approach, we recommend requiring LSEs to procure flexible resources in accordance with flexible categories based on varying must-offer obligations and energy limitations. We support a modified version of the flexible categories proposed by PG&E. We recommend adopting a three- category approach with fixed monthly percentage limits. We believe this approach is simple and creates provisions for preferred resources to participate in the flexible capacity procurement framework.

Staff recommends that LSEs procure and show their flexible resources according to the characteristics defined in Table-1. This requirement will end on or before December 31, 2017.

⁵ CAISO Reliability Service Issue Paper (January 28,2014)

⁶ http://www.caiso.com/Documents/PG_ECComments-FlexibleResourceAdequacyCriteriaMustOfferObligation-FifthRevisedStrawProposal.pdf.

Table -2 Categories of must-offer

	Category 1	Category 2	Category 3
Must-offer obligation	17 Hours 5 AM- 10 PM Daily	5 Hours (time determined seasonally) Daily	5 Hours (time determined seasonally) Non-holiday weekdays
Energy limitation	At least 6 Hours	At least 3 Hours	At least 3 Hours
Starts	The minimum of two starts per day or the number of starts allowed by operational limits as determined by minimum up and down time	At least one start per day	Minimum 5 starts a month
Percentage of LSE portfolio of flexible resources applicable each month	At least 80%	Up to 20% (Categories 2 and 3 are cumulative)	Up to 5%

Further, staff analyzed the 2014 annual flexible RA showings. We observed that almost all of the flexible resources reported by LSEs were in category 1. If the ISO observes a collective deficiency in these categories, it might backstop to meet the requirements. In case of such a shortfall, staff will allocate the backstop costs to LSEs based on their respective load ratio shares. The categories will be assessed annually and the percentages for flexible categories may change accordingly.

The ISO is expected to issue monthly advisory targets to the CPUC for flexible

categories in the FCR study (See Section 3). Staff will design the annual RA compliance template to implement the monthly category limits and issue the template to LSEs along with the overall RA obligations, in July of each year. Staff will validate the RA showings to ensure that the flexible categories are met and issue deficiency notices where essential.

Long term approach

While staff supports allowing participation of use-limited resources through the creation of categories in the interim period; we also acknowledge that we must develop a long term framework to further enable the participation of all qualifying resources. Further, the Commission will design a long-term approach with an eye toward enabling greater consistency with the State's loading order for preferred resources to meet flexible capacity requirements, based on learning following implementation of this proposal, which may include a revision of percentage or timing limitations on all flexible categories.⁷ Therefore we recommend that LSEs should include the following information in their monthly and annual flexible RA filings. This information will be used to inform a long term approach for managing use-limited resources and allowing participation of preferred resources. The LSE should indicate which of its resources in the committed flexible RA portfolio are use-limited.

Section XI. Next steps for 2016 RA year

This proposal establishes a flexible capacity framework for 2015. Staff further recommends exploring the following issues for the 2016 RA compliance year.

1. Explore a flexible capacity allocation methodology that reflects causation.
2. RA compliance is complex and includes multiple degrees of scrutiny regarding

⁷ In the case of demand response resources, the Commission will design future programs to meet CAISO and CPUC RA criteria, for flexible, system and local, as they exist in this proposal and as these criteria are modified in the future.

requirements for system RA, local RA, and flexible RA, monthly CAM allocations, import allocations, Path 26 restrictions, regular true ups, load migration adjustments, flexible categories etc. Comprehensively reform the RA procurement framework and adopt rules that simplify the compliance process.

3. Further assess if the three flexible categories address the objective of managing use-limited resources and allowing the participation of preferred resources and the appropriateness of characteristics for each category. For example, category 3 resources only need to provide flexibility during the weekdays. We might evaluate current DR programs and recommend changing the weekday requirement to a daily requirement.
4. Explore the possibility of exempting flexible resources from satisfying system RA requirements. System RA is geared towards meeting peak load while flexible meets non-peak requirements. We will assess the overall impact on contracting, procurement, and must-offer obligations before recommending this policy.

Section XII. Timetable and functions for flexible RA

Date	ISO function	CPUC function
March	ISO issues draft FCR and LCR	
May 1	ISO submits FCR study (with LCR) to CPUC. CPUC parties may vet these studies and submit comments to RA proceeding	
May	Draft EFC List (with NQC list)	Calculate draft EFC (with NQC) lists and post to CPUC website
End of May		Annual RA Proposed Decision for compliance year adopting local capacity and flexible capacity requirements
End of June		Annual RA Decision for compliance year adopting local capacity and flexible capacity requirements
July		CPUC staff sends out flexible capacity obligations for LSEs along with local and system RA obligations
September 1	Final EFC List (with NQC list)	Final EFC List (with NQC list)
September		CPUC staff sends out revised flexible obligations (with system and local obligations) to account for load revised forecasts
End of October	Year-ahead LSE RA filings showing 90% of flexible obligations due	Year-ahead LSE RA filings showing 90% of flexible obligations due
Each Month T-45	Month-ahead LSE RA filings showing 100% of flexible obligations due	Month-ahead LSE RA filings showing 100% of flexible obligations due
T-25	LSE may receive discrepancy notice in case of shortfall (informational only)	LSE may receive deficiency notice in case of shortfall. LSEs have five business days to cure the deficiency.

Contact Details

Comments will be part of the record for RA proceeding R.11-10-023. If you have any questions please contact Megha Lakhchaura at:

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