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**BEFORE THE
PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Oversee
the Resource Adequacy Program, Consider
Program Refinements, and Establish Annual
Local and Flexible Procurement Obligations
for the 2016 and 2017 Compliance Years

R.14-10-010
(Filed October 16, 2014)

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39 E)
COMMENTS ON STUDY PLANS FOR
FLEXIBLE CAPACITY REQUIREMENT TOPICS**

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Pursuant to the schedule set forth in the September 13, 2016 *Assigned Commissioner and Administrative Law Judge's Phase 3 Scoping Memo and Ruling* (Phase 3 Scoping Memo), Pacific Gas and Electric Company (PG&E) provides its comments on the study plans for flexible capacity requirement topics.

The Phase 3 Scoping Memo provides guidance on the topics the California Public Utilities Commission (Commission) would like to see addressed in these comments. First, it identifies four "scoping questions" relating to the Commission's establishment of a durable flexible capacity requirement (FCR) program:

1. What reliability need(s) must FCRs be designed to meet?
2. What definition of one or more flexible capacity products should be adopted to meet this need or needs?
3. How should annual FCR requirements be set to meet this need or needs with the defined product(s)?
4. What, if any, related changes to the RA program should be made to best meet the reliability needs?¹

¹ Phase 3 Scoping Memo, p. 4.

Second, it sets out five “guiding questions” to more explicitly guide the efforts of parties and the Commission’s advisory staff:

1. Have the current FCRs changed the quality or quantity of resources procured by the LSEs to meet RA requirements since the adoption of these requirements for the 2015 RA year?
2. Have the FCRs changed the overall quantity or quality of resources bidding in to CAISO energy and ancillary services markets (vs. self-scheduling)? Have the FCRs substantially changed the bidding behavior of LSEs and Scheduling Coordinators?
3. What are the characteristics of flexibility that are needed now and over the next five years? For example, does the expected increase in variable energy resources, and potential for increased uncertainty and variability in net-load, change the needed characteristics of flexibility in this time? What specific reliability metrics or goals might not be achieved due to inadequate flexibility? Do the current FCRs address the full spectrum of the electricity system’s flexible needs now and over the next five years?
4. What, if any, characteristics of flexibility are not currently supplied appropriately through the FCR program, other procurement programs, or CAISO energy and ancillary services markets?
5. What, if any, contractual, economic, or structural barriers exist that hamper the ability of existing or planned resources capable of providing flexibility from doing so?²

Finally, the Phase 3 Scoping Memo explains more specifically what the Commission is looking for in the comments on study plans for FCR topics:

For the Study Plans on FCR Topics, we request that parties propose ideas on how to inform the Commission’s understanding of the guiding and scoping questions above. We encourage parties to propose plans for their own analytic work or research, either individually or as a group. Further, parties may pose suggestions

² Phase 3 Scoping Memo, pp. 4-5.

for Staff analysis or research. Finally, parties may present information or analysis directly in response to the questions.³

In response to the Phase 3 Scoping Memo in general, and these directives in particular, in these comments PG&E provides some preliminary, general comments on the FCR topics. Additionally, PG&E provides two lists of analysis. First, PG&E provides a list of analysis that has already been conducted that can help inform the Commission's efforts to establish a durable FCR program.

Second, PG&E provides a list of analysis that PG&E encourages the Commission to have carried out as a part of this proceeding, additional analysis that PG&E believes will be helpful to the Commission's efforts to establish a durable FCR program.

PG&E also provides very preliminary comments on two other topics that the Phase 3 Scoping Memo identifies for consideration: the adoption of an effective load carrying capacity (ELCC) methodology for use beginning in 2018; and the establishment of a multi-year resource adequacy (RA) requirement.

I. DISCUSSION

A. Durable Flexible Capacity Requirement Program And Revised Resource Adequacy Generally

1. Overall Comments

PG&E appreciates the Commission's recognition, set out in the Phase 3 Scoping Memo, of the inter-relatedness of the local and flexible RA requirements for 2018, a durable form of FCR, multi-year RA requirements, and ELCC of wind and solar resources as well as other existing requirements of the RA program. PG&E agrees with the Commission that there have

³ Phase 3 Scoping Memo, pp. 8-9.

been many changes to the RA program over the years, by both the Commission and the California Independent System Operator (CAISO), that have considerably increased its complexity.⁴

PG&E strongly supports the Commission’s “goal of ensuring that the revised RA program is cost effective, based in clear reliability principles, and not more complex than appropriate to meet [the Commission’s] goals.”⁵ PG&E supports the Commission’s encouragement of parties to consider whether aspects of the RA program that may be outdated.⁶ PG&E anticipates that as Phase 3 progresses it may identify specific aspects of the RA program that, from PG&E’s perspective, have become outdated.

The Phase 3 Scoping Memo asks parties to explicitly describe what reliability objectives may be endangered by inadequate flexibility, and to quantitatively explain under what conditions a reliability event may result.⁷ PG&E provided its view on the reliability objectives associated with flexibility in its June 29, 2016 *Comments on Track 2 Issues, Workshop, and Workshop Report* (PG&E June 29, 2016 Comments). In those comments, PG&E identifies three distinct flexible operational needs: within the day; within the hour; and contingency.⁸ PG&E also observes that it does not equate operational needs with flexible RA requirements.⁹ PG&E anticipates that as Phase 3 progresses, the discussion may provide more details regarding how

⁴ See, Phase 3 Scoping Memo, pp. 2-3.

⁵ Phase 3 Scoping Memo, p. 3.

⁶ See, Phase 3 Scoping Memo, p. 3.

⁷ Phase 3 Scoping Memo, p. 5.

⁸ PG&E June 29, 2016 Comments, p. 3.

⁹ PG&E June 29, 2016 Comments, pp. 2-3.

the identified flexibility needs may, or may not, require associated flexible RA requirements. One initial PG&E suggestion is revisiting whether the three-hour ramp is the right metric for determining flexibility requirements. The data gathering PG&E proposes below will aid in carrying out that reassessment.

Also, PG&E recommends explicit consideration of one topic that is not mentioned in the Phase 3 Scoping Memo. The CAISO is currently considering expansion to include investor-owned utilities that do not operate exclusively in California and are subject to oversight by other states. In that context, the CAISO is proposing to revise the existing RA framework. PG&E recommends that in Phase 3 the Commission explicitly consider the potential impact of CAISO expansion on potential flexibility requirements, and on the RA framework generally.

2. Already Available Studies And Data Analysis That Might Usefully Inform The Commission's Study Plans For Consideration of Durable Flexible Capacity Topics

PG&E's view of flexible reliability requirements is, in part, based on results obtained from the Flexibility Metrics Project, a component of the research and development project entitled *California Energy Systems for the 21st Century* (CES-21), which is described very generally on the Commission's website.¹⁰ CES-21 was authorized by the Commission in Resolution E-4677, which describes the Flexibility Metrics Project in more detail.¹¹ PG&E made a public workshop presentation on the Flexibility Metrics Project on January 6, 2016

¹⁰ <http://www.cpuc.ca.gov/General.aspx?id=4801>.

¹¹ Resolution E-4677, pp. 15-24.

(January 16, 2016 CES-21 Workshop Presentation),¹² which also includes a brief overview of the Project.¹³

Key preliminary findings of this component of CES-21 include:

- The ability to curtail renewable resources and the ability to ramp imports and exports are key sources of flexibility to the CAISO system, and should be realized to the extent possible;
- In addition, sufficient amount of reserves (e.g., load following) must be set aside to address intra-hour flexibility needs; and
- Assuming the above elements are addressed, flexibility (under scenarios studied in the project) is largely an issue of economics, not reliability.¹⁴

Other analysis from other sources is also available to inform the Commission's development of study plans on FCR topics. This includes:

- CAISO Department of Market Monitoring (DMM) research on economic bidding by generation type, found in the DMM's *2015 Annual Report on Market Issues & Performance* (DMM 2015 Annual Report),¹⁵
- DMM research on relaxation of power balance due to insufficient upward and downward ramping capacity,¹⁶ and
- DMM research on the effectiveness of the flexible ramping RA requirements.¹⁷

¹² The January 16, 2016 CES-21 Workshop Presentation can be found at <http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=9282>.

¹³ January 16, 2016 CES-21 Workshop Presentation, pp. 4-5.

¹⁴ See, January 16, 2016 CES-21 Workshop Presentation, p. 6.

¹⁵ DMM 2015 Annual Report, p. 92. The report can be found at <http://www.caiso.com/Documents/2015AnnualReportonMarketIssuesandPerformance.pdf>.

¹⁶ DMM 2015 Annual Report, p. 81.

¹⁷ DMM 2015 Annual Report, p. 209.

3. Analysis And Data That Might Usefully Inform The Commission's Study Plans For Consideration of Durable Flexible Capacity Topics

PG&E supports the direction the Commission is taking to work with the CAISO to receive data necessary to assess the impact, if any, that the flexible RA program has had on economic bidding in the CAISO markets. The Commission staff, working with the CAISO and other parties who have entered into appropriate non-disclosure agreements, can provide stakeholders with an accurate assessment of how much flexibility is currently provided in CAISO markets in light of the existing flexible RA requirements. This will involve conducting an analysis regarding what types of resources are now providing economic bids into the CAISO markets that were not providing economic bids before the implementation of the flexible RA program, as well as an examination of whether the proportion of self-scheduled resources has changed.

More specifically, PG&E recommends the Commission staff and the CAISO review the following:

- Bid data
 - *Economic bidding and self-scheduling data of RA resources and non-RA resources by generation type.*
 - This data will provide insight into whether the RA program is impacting economic bidding.
 - *Economic bidding and self-scheduling data of flexible RA resources and system RA resources by generation type.*
 - This data will provide insight into whether the flexible RA component of the overall RA program is impacting economic bidding.
 - *Economic bidding and self-scheduling data of renewable resources by on-line date.*
 - This data will help to determine whether newer vintage renewable resources are more likely to provide economic bids. If newer resources are providing significantly more economic

bids, then it is possible that the flexible needs associated with new renewable resources are smaller than older renewable resources due to either technological or contractual changes, or both.

- Out of market solutions
 - *The frequency of self-schedule reductions by the CAISO in real-time and day-ahead due to a surplus of system generation. This would exclude self-schedule cuts due to transmission limitations, outage cards, and other drivers not directly related to flexibility.*
 - *The frequency of the CAISO activating its over-generation protocols.*
 - These two sources of data will provide an understanding of how often the CAISO lacks the flexibility it needs to solve supply and demand balance through market mechanisms and must therefore resort to out-of-market protocols.
- Other market changes
 - *The revenues associated with the flexible ramping product after implementation, and during the increased regulation requirements from February – May 2016.*
 - This data will help assess the effect of the CAISO markets on obtaining flexibility from resources.

In addition to this information, public data can be used to assess the accuracy of the forecasted ramps associated with current flexible RA requirements, as compared to actual observed monthly maximum 3-hour ramping events. This data could provide some information on whether the existing approach to determining flexibility requirements accurately captures the true ramping needs. A large forecast error would indicate that flexibility might be better procured through the energy markets rather than through a forward requirement, to avoid either costly over-procurement or ineffective market signals associated with under-procurement.

Assessing the various forecast errors in the CAISO market (i.e., load day-ahead versus actual, wind and solar day-ahead versus actual) can provide an understanding of the type of flexibility needed; the flexibility needed to respond to demand changes that can be known in

advance of the day-ahead CAISO markets run (forecasted variation) is different than the flexibility needed to respond to uncertainty associated with load and generation that remains unresolved until the day-of timeframe (unexpected variation). Currently, flexible RA capacity must meet fairly stringent flexibility requirements; however, forecasted variation can be met by a broader set of resources with less flexible attributes (e.g., longer start times) than unexpected variation. If there are sufficient resources available in the day-ahead timeframe to meet forecasted ramping needs, the system flexibility could be limited to resources capable of responding to unexpected variation in the CAISO real-time market.

Of note, CAISO's new flexible ramping product has been explicitly designed to address unexpected variation, and may be useful as a framework to assess the flexible capacity requirement.

B. Effective Load Carrying Capacity

Consistent with the questions raised, these comments focus primarily on FCR topics. With respect to the Commission's efforts to establish ELCC as the methodology for determining the qualifying capacity (QC) for wind and solar resources, the Phase 3 Scoping Memo notes that the goal is implementation for the 2018 RA year, that the topic remains in scope, and that workshop(s) will be held in October.¹⁸ PG&E requests that the Commission continue to place a high priority on implementation for the 2018 RA year.

On this topic, PG&E makes three general observations. First, PG&E encourages the Commission to separate ELCC workshops from FCR workshops. Each topic standing on its own presents more than enough issues to be considered in its own workshop, or set of workshops.

¹⁸ Phase 3 Scoping Memo, p. 8.

Second, PG&E encourages the Energy Division and the Commission to keep the initial ELCC implementation as simple as possible. Additional complexities may be appropriately addressed as the ELCC methodology is refined for subsequent years, but it is not necessary to reflect all possible refinements in the initial, 2018 implementation. Further, an effort to fully address all possible refinements before 2018 may result in yet another year of delay, as the Energy Division and the Commission might not be able to develop a fully refined methodology in time to implement for the 2018 RA year.

Third, PG&E reiterates its appreciation of the Energy Division's continuing efforts to develop a workable ELCC methodology, and looks forward to participating in the upcoming ELCC workshop(s).

C. Multiple Year Resource Adequacy

Turning last, and briefly, to multi-year RA, PG&E supports the presentation on the current status of forward capacity procurement.

Looking toward the future, PG&E supports the development of such reports on a periodic basis, whether in this proceeding or in the integrated resource plan (IRP) proceeding.¹⁹ This is consistent with the August 11, 2016 Energy Division *CPUC Staff Concept Paper on Integrated Resource Planning* (Staff Concept Paper) provided in the IRP proceeding, which describes a Commission staff compliance determination including a “validation of system or local capacity and flexibility sufficiency.”²⁰ A biennial assessment of capacity and flexibility sufficiency in the IRP, and a multi-year requirement in the existing RA program might be duplicative.

¹⁹ R.16-02-007.

²⁰ Staff Concept Paper, p. 22.

