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 Procurement Obligations	R.11-10-023 (Filed October 20, 2011)

COMMENTS OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 E) ON THE RESOURCE ADEQUACY FLEXIBLE PROCUREMENT JOINT PARTIES' PROPOSAL

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Pursuant to the schedule set forth in the December 6, 2012, Phase 2 Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge (Phase 2 Scoping Memo), Pacific Gas and Electric Company (PG&E) provides these comments on the "Resource Adequacy and Flexible Capacity Procurement Joint Parties' Proposal," (JP Proposal) dated October 29, 2012, and attached as Attachment A to the Phase 2 Scoping Memo. In Attachment B, the Phase 2 Scoping Memo sets forth several questions about the JP Proposal.

The JP Proposal is supported in whole by the California Independent System Operator (CAISO) and San Diego Gas & Electric Company (SDG&E), and in part by Southern California Edison Company (SCE). For its part, PG&E participated actively in the discussions leading to the JP Proposal, but in the end determined that it could not support the JP Proposal.

PG&E recommends that the JP Proposal be modified before it is used to establish obligations for the 2014 resource adequacy compliance year. Specifically, the proposed flexible resource counting rules should be modified:

1) Flexible, use-limited hydroelectric resources should be required to have *6 hours of energy* per day per MW of flexibility, not the 17 hours of energy required by the JP Proposal. The JP Proposal's obligation to submit *17 hours of bids* each day would remain. The 6 hour energy limit will result in an additional intra-day constraint in the CAISO markets.
2) The amount of flexible capacity available from a hydro resource should be based on prospective availability assessments of flexible capacity from the hydro resource owner/operator, as supported by annual and monthly availability plans provided to the CAISO, not based on historical bids using an average reference year as recommended in the JP Proposal.

With these corrections, PG&E supports the use of the JP Proposal framework to implement flexibility requirements for the 2014 resource adequacy showing.

PG&E also recommends that additional refinements be developed in time for the 2015 resource adequacy compliance year. Specifically, the JP Proposal's definition of what constitutes flexible resources needs to be aligned more closely to how the CAISO and other parties think of flexibility requirements in the context of the Long-Term Procurement Plan (LTPP) proceedings. The JP Proposal's single, simplified measure of flexibility is not enough to ensure system reliability beyond 2014.

Additionally, PG&E urges the Commission to move to a multi-year resource adequacy framework. In light of the CAISO's continually expressed concerns, manifested in a variety of ways, that a year-ahead framework does not provide sufficient certainty with respect to grid reliability, the resource adequacy program should incorporate a multi-year look-ahead as soon as possible.

The remainder of these comments is broken into three parts. The first part discusses

- PG&E's recommended changes to the counting rules, and
- PG&E's proposed approach to align the definition of flexibility more closely with the flexibility requirements discussed in the LTPP proceedings.

The second part reinforces PG&E's recommendation that the Commission develop a multi-year resource adequacy framework in the near future, and the third part responds to the questions set forth in Attachment B of the Phase 2 Scoping Memo.

I. THE JP PROPOSAL HAS TWO SIGNIFICANT SHORTCOMINGS THAT MUST BE ADDRESSED, ONE NOW AND THE OTHER FOR THE 2015 COMPLIANCE YEAR

For implementation for the 2014 compliance year, PG&E recommends that the eligibility criteria for flexible capacity should be modified to allow energy-limited resources such as flexible hydro capacity that the CAISO currently uses for flexible services to count toward flexible capacity requirements.

The question of how flexible capacity defined in the future should be addressed before flexible capacity requirements are fully implemented in subsequent years.

A. The Obligations Placed On Flexible Resources Do Not Adequately Take Into Account The Operational Constraints Of Those Resources Or The Benefits Provided By Those Resources Across A Year

1. The JP Proposal Is Not Cost Effective Because It Essentially Eliminates The Ability Of Flexible Hydro Resources To Count Toward A Load Serving Entity's Flexible Resource Obligations

Use-limited, dispatchable hydroelectric resources can be an important source of highly dispatchable flexibility that helps to ensure reliable CAISO operations and markets, and that does so in a cost effective and emissions-free manner. Historically, these resources have been managed to ensure their availability across months, seasons, and years to meet the needs of the system while also complying with restrictions on use due to Federal Energy Regulatory Commission (FERC) license requirements, safety considerations, hydrological conditions, and other obligations.

Any adopted flexible capacity requirements should recognize these useful attributes, allow for the budgeting of the available energy across the year, and should not unduly exclude flexible hydro resources from participation.

Among other requirements, the JP Proposal would create procedures for the establishment of capacity that can be counted toward a Load Serving Entity's (LSE) flexible capacity resource adequacy obligation, and would create bidding requirements into the CAISO Day-Ahead Integrated Forward Market (IFM) and Real-Time Markets (RTM) for such resources to the extent that they are used to meet an LSE's flexible capacity resource adequacy obligation.

The JP Proposal is fundamentally flawed with respect to the qualifications and counting requirements for flexible, use-limited hydro resources. This aspect of the JP Proposal should be modified.[1] The JP Proposal is unduly restrictive with regard to what it will allow to count toward LSEs' flexible resource obligations, and so would unnecessarily limit the ability of flexible hydro resources to count toward that obligation.

In particular, the JP Proposal would: (1) require flexible resources to have 17 hours of energy behind the required 17 hours of bids (HE6-22, IFM and RTM) for each day for a full month, and (2) establish the amount of available flexible capacity for a hydro resource be based on historical bids using an average reference year. Both of these requirements are too limiting,

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[1] CAISO and SDG&E support the Section 5.4, Procuring and Counting of Hydro Resources, of the JP Proposal. SCE did not support this section.

and both should be modified.

As an alternative and improvement to this approach, PG&E recommends two changes to the JP Proposal:

1) Flexible resources should be required to have *6 hours of equivalent energy* (not 17 hours). The obligation to submit 17 hours of bids each day should remain. This will result in an additional intra-day constraint in the CAISO markets; and
2) The amount of flexible capacity available from a hydro resource should be based on prospective availability assessments of flexible capacity from the hydro resource owner/operator, as supported by annual and monthly availability plans provided to the CAISO.

a) Daily Energy Requirement For Hydro Facilities

The JP Proposal's requirement for 17 hours of energy behind the daily bids of flexible resources would unduly disqualify a significant amount of flexible hydro resources from counting toward LSEs' flexible resource obligations, and effectively require an increased use of thermal resource alternatives for that purpose.[2] PG&E's proposed revision of the daily energy requirement from 17 hours to 6 hours improves the effectiveness of the JP Proposal by continuing to ensure sufficient energy behind the capacity is available while at the same time preventing over-dispatch in the CAISO's daily markets which could produce the undesirable result of using too much water too early in the year and not budgeting its use so that the resource is available over longer timeframes than the CAISO's dispatch models are able to consider.

The requirement in the JP Proposal for a resource to count as flexible is 3 hours of energy at its maximum; there is a need for two ramps a day, so PG&E proposes to make 6 hours of energy available as the minimum. A significant requirement for the CAISO during most periods of the year[3] is to meet two ramp events per day. Establishing a minimum 6 hours or equivalent energy per day will assure that any resource used to meet the flexibility obligation will have sufficient energy to address both morning and evening ramp events each day.

The 17 hour daily energy requirement is not necessary to meet the CAISO's operational needs. Further, many, if not most, flexible hydro resources would not be able to meet the 17 hour daily energy requirement. There is inadequate water (available fuel) to support meeting that requirement day-in and day-out over the course of a month or year, and overuse of hydro

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[2] As discussed below, even traditional fossil fuel resources may not be able to count toward LSEs' flexible resource requirements under the JP Proposal.

[3] Ramping events during the third quarter of the year appear less extreme but somewhat more prolonged.

means less will be available at later times to meet reliability needs.

An increased reliance on thermal resource alternatives to meet flexible resource adequacy requirements, due to the associated must-bid obligations in the IFM and RTM energy and ancillary services markets, could potentially lead to changes in actual CAISO market results and resource dispatches. The PG&E alternative will reduce the unwanted possibilities of:

- CAISO minimum-load/over-generation issues (during periods between the two daily ramps),
- CAISO uplift costs for excessive minimum load/multiple daily starts, and
- potential resource un-availability issues (i.e. thermal resource with minimum down times or restricted number of starts per day that may make these resources un-available to meet *both* of the anticipated daily ramp events).

Because flexible hydro resources can, in fact, provide substantial amounts of the flexibility needed by the CAISO to reliably operate its system, the JP Proposal should be modified so that flexible hydro resources are not needlessly limited in their ability to count toward LSEs' flexible resource obligations. Increased participation of flexible hydro resources would lower ratepayer costs and potentially reduce state greenhouse gas emissions[4] relative to reliance on thermal resource alternatives to meet flexible resource obligations, as is effectively promoted by the JP Proposal as it is currently structured.

b) Determination Of Available Flexible Capacity For Hydro Resources

The JP Proposal would establish the amount of flexible resource capacity based on PMax testing for thermal resources, but proposes a different standard for hydro resources based on historical bids for these resources, using an average reference year based on the previous five year period. This aspect of the JP Proposal should be modified as well.

The use of a backward-focused assessment does not accurately reflect anticipated availability for the future periods (i.e. the upcoming year and upcoming months), and unnecessarily discriminates against these resources which could also be PMax tested to ensure their flexibility ranges. The use of an average hydro year selected from the prior five year period represents only a limited reflection of anticipated flexible hydro capacity based on forward

[4] General bidding of hydro resources would not be expected to change if these resources qualify to satisfy flexible resource adequacy requirements or not, however an increased reliance on thermal resources to meet those obligations, due to the associated must-bid requirements, could change CAISO market results. Changes might include increased commitment and dispatch of the thermal resources.

weather and hydrological forecasts. Anticipated future flexible hydro capacity can also be affected by future permitting/FERC license changes.

Therefore, PG&E's proposed approach is for the respective hydro resource owner/agent to prospectively assess the flexible hydro availability, and then support that assessment through the development and submittal of Availability Demonstrations within the annual and monthly resource adequacy process.

Requirements would include that flexible capacity must be dispatchable, and that it cannot exceed the resource's PMax. On a monthly basis the flexible resource must be expected to have at least 6 hours of equivalent energy available daily throughout the month, and consistent with the JP Proposal, would be required to provide 17 hours of bids each day (subject to possible charges if not substituted or otherwise excused by CAISO).

The two changes outlined above, (1) to limit the daily energy requirement to six hours per MW of flexible capacity while still requiring 17 hours of bids daily (which the CAISO can use in its optimization), and (2) to set the amount of available flexible capacity from a resource based on a prospective Availability Demonstration provided to the CAISO on a monthly basis, improve the JP Proposal and better support a cost effective yet operationally feasible resource adequacy program incorporating the operational need for flexible resources.

2. The JP Proposal Does Not Adequately Take Into Account The Operational Constraints Faced By Many Generation Facilities, Including Traditional Fossil-Fuel Powered Resources

An important consideration in the qualification of flexible capacity is the fact that resources used to balance the electrical system will be required to change output more frequently in the future than they are currently. This includes an increase in the starting and stopping of resources as net load changes across the day. The JP Proposal does not explicitly address how resources are expected to limit the amount they run except through bidding behavior of units. The JP Proposal does not accommodate any limitation that a resource might have in the number of starts and stops it can incur during a given time period. Multiple starts a day are not likely a part of the production profile resources used in securing air permits.

Consideration needs to be given to limits that may exist on the number of starts and stops that resources can incur to ensure that the resource pool in California fits with the paradigm and obligations set out in the JP Proposal.

B. The Flexibility Requirements In The JP Proposal Do Not Adequately Address The Need For Flexibility Beyond 2014

PG&E recognizes the desire to start requiring flexible capacity for the 2014 compliance year, and supports such an objective provided that the CAISO and the Commission commit to a more complete implementation of flexibility requirements into the resource adequacy framework, along the lines of what is described below, for 2015 resource adequacy compliance year and beyond.

The JP Proposal states that the proposed framework is intended to work on an interim basis defined as 2014-2017.[5] There is no demonstration that this simplified flexibility framework will actually work for the entire intended interim period, particularly since the flexibility need is likely to change dramatically in 2015, as illustrated in Figure 1 of the JP Proposal.

1. The Amount Of Flexible Capacity Required In The Proposal Is Insufficient To Ensure Reliability Over The Longer Term

The JP Proposal calculates flexible capacity requirements equal to:

(1) The largest three hour contiguous ramp of the month, plus

(2) The largest of: a) the Most Severe Single Contingency (MSSC), or b) 3.5 percent of the month's expected peak.[6]

The JP Proposal does not provide the system with enough operating flexible capacity for ramping within an operating day, managing the intermittency of load, and renewables, and covering contingency and regulating reserve requirements.

PG&E estimates the JP Proposal requires flexible capacity amounts ranging from about 16 percent of summer monthly peaks to 30 percent of winter monthly peaks, out of a total 115 percent of monthly peak total capacity requirement. But if the CAISO were to receive only these amounts of flexible capacity (and all other capacity were self-scheduled without contributing to meeting the daily ramp requirements), the CAISO would not be able to balance loads and resources. Consequently, this amount of flexible capacity is not enough to manage the system properly in the coming years.

Therefore, it appears that the JP Proposal assumes that additional operating flexibility will be made available to the CAISO from resource adequacy capacity that the JP Proposal

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[5] JP Proposal, p. 4.

[6] JP Proposal, pp. 6-8.

classifies as generic, non-flexible capacity. This assumption should be made explicit, and quantified. Further, entities providing such flexible capacity to the system should receive some credit for their contributions to the system need for operating flexibility.

PG&E also highlights for parties' consideration the consequences of setting artificially low flexible capacity requirements. First, in the near term, PG&E is concerned that low flexible capacity requirement will result in LSEs who procure the minimum requirement leaning on other LSEs who have more flexible portfolios. In the long-term, artificially low flexible capacity requirements will result in the CAISO not being able to operate the system reliably. For example, the CAISO's renewable integration studies presented in the 2010 LTPP proceeding (R.10-05-006) have included the following flexible capacity requirements:

- Contingency reserves: About 6 percent of the monthly peaks, instead of the maximum of 3.5 percent of peak or the MSSC.

- Regulation: About 1.5 percent to 2 percent of monthly peak. Regulation reserves are not included in the JP Proposal.

- Following capacity:[7] About 5 percent of the monthly peak. Following capacity is needed to cover the intra-hour variability and forecast uncertainty of load, wind and solar generation. Following capacity requirements are not included in the JP Proposal, except for the term "ε", which is assumed zero.

- Ramping capacity: Ramping capacity should allow the system to ramp from the minimum net load to maximum net load in the day, rather than simply provide the largest 3-hour ramp of the day, as the JP Proposal requires. PG&E estimates that the maximum daily ramp in 2014 ranges from about 40 percent to about 45 percent of the monthly peaks. In contrast, PG&E estimates the JP Proposal's 3-hour ramp requirement varies from as little as 12 percent of the summer months to close to 28 percent in the winter months.

In order to ensure sufficient flexible resources to operate the system consistent with CAISO's estimated flexibility requirements used in the 2010 LTPP renewable integration studies, PG&E estimates that the 2014 flexible capacity requirements should approach about 50 percent out of the current total 115 percent monthly peak forward capacity requirement (in comparison to the 16 – 30 percent required by the JP Proposal). This significant difference should be addressed for the 2015 resource adequacy compliance year.

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[7] Following or load following capacity is needed to cover the intra-hour variability and forecast uncertainty of load, wind and solar generation.

2. A Single Eligibility Criteria Is Inadequate To Define Flexible Requirements For The Longer Term, And Prevents Flexible Resources From Contributing Toward The Flexibility Requirements

Given the diversity of needs for flexible capacity enumerated above, it is not appropriate to use a single eligibility criterion for qualifying flexible capacity, as proposed in the JP Proposal, for the longer term. The CAISO's proposal for 2014 takes a simplified approach and defines flexibility in a particular way, namely the three hour ramping requirement. The definition has been proposed since it is easier to implement. However, in other venues, the CAISO has introduced other ways to measure and secure flexibility. As discussed above, the CAISO used different measures in the 2010 LTPP proceeding.

More recently, the CAISO recently filed for its Flexible Capacity and Local Reliability Resource Retention (FLRR) mechanism at the Federal Energy Regulatory Commission (FERC). In that filing, the CAISO described flexibility needs very similarly to how it described them in the 2010 LTPP proceeding:

> Any parameters for flexibility must support ISO operational needs and align with the existing market structure and resource adequacy construct. Consistent with these objectives, the ISO has determined that appropriate, durable parameters for assessing flexibility are these three operational attributes:
>
> - Maximum continuous ramping --
>
> *Maximum continuous ramping is the megawatt amount by which the net load (load minus wind and solar) is expected to change in either an upward or a downward direction continuously in a given month.*
>
> - Load following --
>
> *Load following is the ramping capability of a resource to match the maximum megawatts by which the net load is expected to change in either an upward or a downward direction in a given hour for the relevant resource adequacy compliance month.*
>
> - Regulation --
>
> *Regulation is the capability of a generating unit to automatically respond during the intra-dispatch interval to the ISO's four-second automatic generation control signal to adjust its output to maintain system frequency and tie line load with neighboring balancing area authorities.*
>
> These three categories represent the operational flexibility attributes needed by the ISO . . . .[8]

[8] CAISO December 12, 2012, Transmittal Letter, Attachment C, pp. 4-5 (Docket No. ER13-550).

Finally, earlier this year in this proceeding, the CAISO introduced the need for three types of capacity: regulation, load following, and maximum ramping.[9]

PG&E proposes that flexible capacity used to satisfy uncertainty-based flexibility requirements, such as regulation, contingency reserves and in the future load following or following requirements, should have eligibility requirements that correspond to requirements associated with these products in CAISO short-term markets. Flexible capacity used for ramping or intra-day flexibility requirements should receive flexible capacity credit to the extent they can shave the net load peak or reduce the net load ramping needs of the system. These could include energy-limited, but flexible resources such as dispatchable hydro, energy storage, or demand response. PG&E urges the Commission to address these topics in time for the 2015 resource adequacy compliance year.

3. There Is A Need For Downward Flexible Capacity Requirements

In addition, the JP Proposal does not provide for explicit downward flexibility requirements. The system will require both upward and downward flexible capacity. Furthermore, downward flexibility is likely to be particularly challenging in the coming years during spring months as the CAISO's studies have shown. Downward flexibility is already challenging today, and should be included in the resource adequacy requirements in the future, even if it is not explicitly incorporated into the 2014 resource adequacy requirements adopted as a result of this proceeding. Providing incentives for intermittent generators to invest in equipment to control output should be a part of resource adequacy requirements in the long run.

II. THE COMMISSION SHOULD MOVE TO A MULTI-YEAR RESOURCE ADEQUACY PROGRAM AS QUICKLY AS IS FEASIBLE

PG&E appreciates the Commission's effort to address the changing needs of the electric system by adding a flexibly requirement to the one-year resource adequacy process. While not applicable to the immediate proceeding as its scope is currently defined, PG&E reiterates the importance of the Commission addressing these needs further by acting on PG&E's motion to move consideration of a multi-year forward showing of resource adequacy from Track 3 of the 2012 LTPP proceeding (R.12-03-014), which is focused on the Investor-Owned Utilities' bundled procurement plans, to a separate track in the resource adequacy proceeding, which is

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[9] R.11-10-023: RA Flexibility Workshop Flexible Capacity Procurement Proposal (PowerPoint Presentation), slide 11.

focused on the reliability obligations of all Commission-jurisdictional LSEs. The requirements of any multi-year program will be inextricably tied to the specific requirements of the one-year program, and so it makes sense to develop the multi-year program using the same forum used to develop the one-year program.

III. RESPONSES TO QUESTIONS IN ATTACHMENT B TO THE PHASE 2 SCOPING MEMO

A. Reliability Risk

1. What is/are the most critical grid reliability risk-risks that should be evaluated and managed through the flexible capacity procurement initiative?

Increased reliance on intermittent renewables and the retirement of existing dispatchable once-through cooling (OTC) resources increases the need for incremental flexible capacity to enable continued reliable operation of the CAISO grid.

2. This proposal attempts to address reliability risk by recommending that the CPUC establish a monthly interim flexible capacity obligation that is based on the ISO's identified flexible capacity needs.

a. Identify the key tasks required to implement this proposal. Propose the order in which they should be addressed, and discuss whether they should be taken up simultaneously or sequentially.

b. Can the difference between load and net-load be met partially by introducing curtailment provisions in renewable contracts (particularly solar resources)?

Reducing this aggregate wind and solar generation (the difference between load and net load) can be addressed through the introduction of provisions in renewable contracts, however there are two major implications of doing so:

1) There will be a cost to compensate parties for the lost energy revenues they anticipated obtaining by generating during those hours combined with the need to re-open previously executed and approved contracts. The value of curtailment provisions should take into consideration how quickly and at what rate a facility can curtail; plus
2) Compliance with renewable portfolio standard (RPS) requirements is based on the number of MWhs generated over the course of the compliance periods, so it is based on actual energy produced. If renewables projects were to be curtailed to manage the difference between load and net-load, that would reduce the amount of MWhs counting towards RPS compliance obligations. One option to try to address this issue is to count the amount of MWhs curtailed towards annual RPS metrics.

Finally, as noted above, the JP Proposal does not include a downward-only flexibility requirement.

c. What are other options to alleviate the underlying reliability risk(s) (e.g. modified bidding behavior, incentives within procurement programs to procure resources that reduce identified reliability risks)? What are the benefits and drawbacks of addressing reliability risk by developing a flexible capacity obligation for LSEs relative to the alternatives?

The underlying reliability risk is that the CAISO will not be able to balance the system when generation it cannot control is providing a significant quantity of power to the grid. The flexible resources are intended to provide the CAISO with the needed controllable resources to maintain that balance. One alternative to providing more flexibility would be to reduce the amount of non-controllable resources providing energy to the grid, or to make some of the non-controllable resources controllable. Generally, this may require investment in equipment to limit the amount of power such resources provide to the grid, but may be a lower cost alternative than building flexible resources that are operated only on a very limited basis, or operating resources in an uneconomic manner to provide required flexibility.

d. In addition to addressing reliability risk, does the flexible capacity obligation have other market impacts?

Yes. Generally speaking, flexible capacity obligations likely will result in an increase in the price paid in the market for that capacity that is flexible over the price paid for generic capacity (since any flexible resource meets all generic plus flexible requirements). Also, since less generic capacity will be required, if the supply of generic capacity is high or grows as more renewables come online, then prices of generic capacity may decrease.

Also, the way in which the flexible capacity obligation is imposed may have market impacts. For example, the JP Proposal, by restricting the counting of flexible hydro resources, creates a reliance on thermal resources in order to meet the flexible capacity obligation. Constraining supply in this way is likely to have impacts on the price for capacity.

Further, to the extent that thermal resources are used more than necessary to manage the CAISO system throughout the day, that can have market impacts, as well. Such resources can have high minimum loads or restrictions on the number of starts per day, both conditions that may create over-generation problems for the CAISO during the net-load valley that occurs between the two daily ramp events, or alternatively, create reliability issues where thermal resources are not otherwise available to help with the second ramp due to minimum down time requirements or restricted starts per day. Reliance on thermal resources for flexibility rather than greater participation of flexible hydroelectric resources would also create additional costs and

additional greenhouse gas emissions (which also translates to higher market costs to procure GHG allowances to meet the emissions).

e. How does this type of proposal, as compared to others, satisfy the Guiding Principles as set forth in the August workshop? (See Draft Guiding Principles in the Appendix to these questions)

The JP Proposal fails to meet Draft Guiding Principle 5 (the RA program should seek to maintain reliability while minimizing costs through market mechanisms).[10] The JP Proposal imposes a single, stringent set of eligibility requirements, which prevents some existing resources from contributing to operating flexibility, and increases procurement costs. Further, it unnecessarily limits the ability of LSEs to use flexible hydro resources to meet flexible resource obligations.

The JP Proposal will also fail to meet Draft Guiding Principle 5, in the longer term, if the Commission does not further refine the flexibility definition in the near future. As discussed above, for the 2015-2016 period the JP Proposal does not require enough flexible capacity in total, and does not recognize that different types of flexibility are needed.

These aspects of the JP Proposal are also in conflict with Guiding Principle 10 (the rules for generator valuation and LSE allocation should be transparent, consider how to promote efficient procurement, minimize market power opportunities, reward existing flexible resources, and incentivize the appropriate resource mix that results in the type and location of resources that are needed to maintain grid reliability). The PG&E alternative proposal described above decreases the unnecessary reliance on thermal resources, increases opportunities for flexible hydro resources and in doing so, enhances CAISO reliability, lowers costs and, by enlarging the eligible pool of flexible resources, may help minimize market power opportunities.

Also, at least one of the Draft Guiding Principles requires additional work. Guiding Principle 7 (the flexibility needs study should be transparent and consistent with CPUC-approved assumptions) is not clear. It is not clear what Commission assumptions the flexibility requirements should be consistent with, and why there is need for such a consistency. The need for flexibility is dependent on weather conditions, and hourly patterns of load, solar and wind generation.

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[10] Draft Guiding Principles are set forth in the Phase 2 Scoping Memo, Attachment B, p. 6.

As is typically the case with a set of guiding principles, there is a need to balance competing considerations, since some of the guiding principles have conflicting objectives. For example, maintaining reliability may require disrupting the existing resource adequacy program, and increasing costs.

B. Interim RA solution (Section 2)

3. The proposed flexibility procurement initiative institutes an interim RA solution for 2014-2017. What are the anticipated impacts of an interim approach on resource adequacy contracts? What factors should the CPUC consider in deciding whether an interim approach is appropriate?

As a result of uncertainty on when the interim period would occur, market participants will be deterred from forward resource adequacy transactions. This uncertainty would create challenges both around the planned start of the interim period and the end. For example, if the Commission were to consider changes for the 2014 annual resource adequacy showing, it would be difficult for LSEs to engage in resource adequacy procurement until details of the 2014 requirements were finalized in 2013. If this were to occur late in the year, it would create adverse circumstances for all market participants to transact in advance of the 2014 Annual Resource Adequacy Filing in October, 2013. In similar fashion, once the interim period begins, market participants will be encouraged to wait and see when the new design is scheduled to be implemented. If there is uncertainty around how long the interim period will last, market participants will be focused primarily on short-term resource adequacy transactions and may be caught in a cycle of interim period extensions one year at a time. When considering an interim approach, the Commission should evaluate the reliability needs that the interim approach is to address, the duration of the interim period (more certainty is good for the market) and administrative ease.

4. Should the flexible capacity start in 2014? Explain why or why not.

If the framework is developed with adequate time to allow commercial transactions for 2014 to take place, PG&E recommends that flexibility requirements be put in place for 2104. In any event, the Commission and the parties should make every effort to complete the development and adoption, this year, of a resource adequacy program incorporating flexibility requirements, so that the program can be put in place for 2015 at the latest.

In 2012, the current resource adequacy structure has provided sufficiently flexible resources to the CAISO's control to be able to balance the system. In 2013, the current structure

is likely to be sufficient to provide flexibility needs in the system. For 2014, the better path is to begin to implement flexibility requirements. Further, as more renewables come on line, the need for greater flexibility will increase.

However, even if the flexibility needs in 2014 can be met by the current resource adequacy paradigm, the adoption of flexibility requirements is complex, and will require significantly more complexity in the resource adequacy showings required of LSEs than is currently the case. The proposal requests the annual showing cover each of the months in the following year and not just the peak summer months. It would be good to work out the system to demonstrate flexibility when the need for flexibility is not as acute as it is likely to be in the future.

C. Development of Eligibility and Needs Methodology (Section 3.1 and Section 3.2)

5. According to the proposal, "flexible capacity need" is defined as the need of the ISO to meet ramping and contingency reserves. (Section 3.1)

a. Is this an appropriate definition of flexibility? If not, please explain what might be an appropriate definition and why.

Not over the longer term. As explained in the first section, the JP Proposal's definition of flexibility should be refined, if not for 2014, then for the 2015 resource adequacy compliance year. For the longer term, flexible capacity requirements should include:

- Contingency reserves: about 6 percent of the monthly peaks, instead of the maximum of 3.5 percent of peak or the MSSC.
- Regulation reserves.
- Following capacity, covers the intra-hour variability and forecast uncertainty of load, wind and solar generation. Following capacity requirements are not included in the JP Proposal.
- Ramping capacity should be defined to cover the minimum to maximum net load ramp in the day, rather the largest 3-hour ramp of the day, as in the JP Proposal.

b. Should flexible capacity needs encompass all of the contingency reserves (E.G. Spin, Non-spin, Regulation up/down?

Yes, flexible capacity requirements should cover all the contingency reserves. Note that regulation is not a contingency reserve. Contingency reserves need to be maintained at all times to protect against resource and transmission contingencies, and should not be counted on as available to manage the intermittency and forecast uncertainty of load, wind or solar generation.

6. Flexibility needs are calculated according to the following formula (Section 3.2)

Flexibility Need$_{MTHy}$=Max[(3RR$_{HRx}$)$_{MTHy}$]+Max(MSSC, 3.5%*E(PL$_{MTHy}$)) + ϵ
Where,
Max[(eRRHRx)MTHy] = *Largest three hour contiguous ramp starting in hour x for month y*
E(PL) = Expected peak load
MTHy = Month y
MSSC = Most Severe Single Contingency
ϵ = *annually adjustable error term to account for uncertainties such as load following*

a. Is the above formula an appropriate measure to calculate flexibility needs and why?

- **E.G. The ISO included the max of either a 3.5% of monthly expected peak load (EPL) or Most Severe Single Contingency (MSSC) factor to the need calculation. This is supposed to ensure that the ISO gets 100% of spinning reserve capacity needed to cover the MSSC.**
  - **What evidence supports using a 3.5% of EPL to provide the spinning reserve needs in an N-1 contingency?**
  - **Is it reasonable to require spinning reserves equal to 100% of MSSC? Please explain**

As discussed above, PG&E supports use of this simplified measure of flexibility for the 2014 compliance year. However, for the longer term, the above formula is not a complete measure to calculate flexibility requirements.

b. According to the proposal, flexible capacity need is based on how much ramp capability a resource can offer and sustain over a continuous three hour period. Is three hours an appropriate duration in which to measure ramping? Support your answer with empirical data when possible.

As just noted, PG&E supports use of this simplified measure of flexibility for the 2014 compliance year. However, beyond 2014, sufficient flexible capacity should be provided for the system to ramp from the minimum to the maximum net load of the day, rather to meet the largest 3-hour ramp of the day. The system will not be able to balance its net load if it only has flexible capacity to meet the largest 3-hour ramp of the day.

c. Is adding an annually adjustable error to ramping requirements term to account for uncertainties appropriate:

- **Should the error factor be capped: If so, what is an appropriate cap level and why?**
- **What criteria should be stipulated to provide appropriate boundaries on what can be included in the error factor (i.e. proportion of wind generation, or distributed generation)?**

According to the JP Proposal, ε (the annually adjustable error term) is used to account for uncertainties such as load following.[11] Uncertainties not covered by the JP Proposal include: a) contingencies that exceed the larger of 3.5 percent of peak demand or the MSSC, and b) the forecast uncertainty of load, wind and solar generation in between real time dispatch (regulation), and intra-hour (load following or following). PG&E recommends for the 2015 compliance year and beyond, the amounts of flexible capacity to manage these uncertainties should be estimated directly (rather than capped). This uncertainty-based flexible capacity requirement can be estimated annually based on the forecast error for load, wind and solar generation, and the amounts of load, wind and solar generation expected in the year.

d. The ISO proposes to use minute-by-minute estimate of load to calculate flexibility needs. Please discuss the suitability of this approach and if this is not suitable, what are the other options?

The minute-by-minute estimates of load, wind and solar generation are useful to estimate regulation and following requirements, or the flexibility needed over a 5-minute interval. Hourly granular estimates of load, wind and solar can provide a reasonably good estimate of ramping. Contingency reserves do not require minute-by-minute data.

e. It appears flexible capacity procurement is overlapping with the determination of operating reserves. Is this appropriate: Can some amount of the PRM be offset, and how can the CPUC manage the overall RA obligation if portions are met with more flexible resources:

As noted before, contingency reserves need to be maintained at all times to protect against resource and transmission contingencies and should not be available to manage the intermittency and forecast uncertainty of load, wind or solar generation. Therefore, there should be no overlap between contingency reserves and regulation or following capacity requirements.

As implied by the last question, a portion of the planning reserve margin (PRM) requirement should be met with flexible capacity. The Commission can manage the resource adequacy obligation by ensuring that LSEs procure the different types of flexible and non-flexible capacity required.

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[11] JP Proposal, p. 8.

7. What process(es) or proceeding should be used to calculate capacity flexibility needs as load and supply change over time?

a. Currently the annual LCR process results in a determination of local capacity needs on an annual basis. Should flexible capacity needs be included within the LCR process, or should a separate but similar process be established to update flexible capacity needs: Please explain.

PG&E proposes the following process to determine forward capacity requirements:

1. The CAISO will estimate the system's future requirements for flexible and non-flexible capacity one to five years ahead of time using best available estimates of the amounts and operating features of load and intermittent resources for those years, such as hour profiles, inter-hour variability and forecast errors, and will present those estimates to the Commission to form the basis for the Commission-jurisdictional LSEs' resource adequacy obligations. This process, with the CAISO conducting a study and presenting it to the Commission for approval, would be consistent with the current annual process used to establish the local capacity requirement (LCR).
2. After Commission adoption, Commission-jurisdictional LSEs will be required to procure forward to meet these requirements. Initially, LSEs will be required to meet the identified year-ahead requirements, with procurement for the full five-year period phasing in over several years.
3. The CAISO and the Commission will repeat the process every year, refreshing estimates for a 5-year forward rolling period.

Because the methodology and tools used to determine LCR versus system operating flexibility requirements are different, a separate but similar process should be used to establish flexible capacity procurement requirements.

b. Who should determine flexibility needs annually – the ISO or some other third party?

As just described, the CAISO should carry out an annual study and present the results to the Commission for approval, similar to the current annual process to determine LCRs.

D. Allocation of Flexible Capacity Requirements (Section 3.3 and Section 3.4)

8. The proposal recommends the CPUC allocate flexible capacity procurement obligations to LSEs based on each LSE's relative share of monthly system peak. Is this a suitable approach: Explain why or why not?

As a general principle, costs should be allocated to those who are causing the costs so they have the incentive to reduce the impact of those costs. In the case of flexible capacity, variations in both supply and demand contribute to the need for flexible resources. Consequently, costs should be borne by both load and supply in relation to the portion of the variations they are causing on the system.

To the extent the proposal does not allocate costs of variable capacity to the supply side, there is economic inefficiency from the misallocation of costs, leading to more variability and a greater need for flexible resources on the system. The JP Proposal departs from cost causation in that it allocates costs only to the load, and also to the extent that flexibility requirements are not correlated with LSEs' loads at system peak. However, allocating costs on a causation basis may require resources that could be better spent in the short term on refining other aspects of the JP Proposal. Consequently, PG&E believes this allocation is an acceptable compromise in getting a flexibility requirement in place for 2014, but should be revisited in the future as the flexibility requirement is better established.

a. What other alternatives exist within CPUC jurisdiction that allows LSEs to demonstrate compliance of flexible capacity obligations? Please discuss the relative costs and benefits of different approaches. (Section 3.3)

The Commission may be able to set flexible obligation for LSEs not just based on the LSEs' loads, but also based on the LSEs' variations in their renewable supply portfolios. LSEs with greater portions of variable renewable resources should be allocated a greater share of the costs. For instance, an LSE with a greater portion of its RPS portfolio from wind is likely causing more variation on the system than an LSE with a significant portion of its RPS portfolio coming from geothermal resources. The first LSE should be allocated a greater portion of providing flexible resources.

While this may be the case in theory, practically it may be expensive to calculate the contribution of flexibility on a LSE basis, either from load variation or from RPS portfolio variation. Given that this is the first incremental step in administrating a flexibility requirement, and the resources required to sharpen the economic signal are likely to be significant, it is more important to dedicate resources to establishing a good mechanism, than it is to getting a highly efficient signal to LSEs.

E. Flexible Capacity Must-offer Obligations (Section 4)

9. In addition to the must-offer obligations that currently apply to RA resources, the flexible capacity must-offer obligation for flexible resources would require resources to submit economic bids into the ISO's real-market between a predetermined set of hours (i.e. 5AM to 10PM).

a. What is the impact of this more stringent must-offer obligation for flexible resources on specific resources?

PG&E is broadly supportive of the 17-hour must-bid obligation. However, PG&E does

not support the requirement that use-limited hydro resources have 17 hours of energy behind the required 17 hours of bids (HE6-22) for each day for a full month. As discussed above, the requirement for 17 hours of energy would unduly disqualify a significant amount of flexible hydro resources and effectively would require an increased use of thermal resource alternatives.

PG&E's proposed revision is to change the daily energy limits from 17 hours to 6 hours per MW of flexible capacity for hydro resources, while still maintaining a 17 hour bid obligation. The CAISO will optimize to ensure the most effective use of the available six hours energy across the 17 hour time period. The CAISO markets would be constrained from placing additional energy requirements on the resource for the remainder of the 17 hours, once the six hours of energy was consumed. A significant requirement for the CAISO during most periods of the year is to meet two ramp events per day, with duration of about 3 hours each (total 6 hours). [12] Establishing a minimum 6 hours of equivalent energy per day will assure that any resource used by an LSE to meets its flexible resource adequacy requirement will have sufficient energy to address both morning and evening ramp events each day, while still retaining the 17 hour bid obligation provides the CAISO ability to optimize the scheduling and dispatch flexibly within the 17 hour period in response to dynamic load, solar and wind conditions.

b. Is the proposed set of hours suitable? Does limiting the hours in which a resource must submit economic bids enable more resources to participate in the flexible capacity initiative?

The proposed set of must-bid hours (HE6-22) is appropriate and supportable based on the projected CAISO ramping needs. The PG&E proposed alternative (described above in the introductory comments) would change the required daily energy limits from 17 hours to 6 hours, but would maintain a 17 hour bid obligation. Providing the proposed set of bid hours (HE6-22) to the CAISO better assures the ability of their markets and operations to adequately respond to dynamic load, solar and wind conditions.

c. Is it appropriate to exclude self-scheduled resources from counting towards flexibility?

PG&E supports the 17 hour must bid (i.e. no self-scheduling) provision of the JP Proposal for the 2014 compliance year. However, there could be alternative approaches. Capacity that is self-scheduled may contribute to meeting CAISO flexibility needs; for example

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[12] Ramping events during the third quarter of the year appear less extreme but somewhat more prolonged.

self-schedules that change hour by hour in conformance with the ramp events would help the CAISO by offsetting the system ramping needs. Given different program designs, it could be appropriate to allow and count such complementary self-schedules. However PG&E is not suggesting a change to the 17 hour must-bid requirement at this point (some self-schedules could hinder CAISO access to flexibility) but highlights that the topic is not necessarily self-evident.

d. Can this risk be alleviated partially by incentivizing resources with Must-Offer Obligations to submit economic bids in the ISO market instead of self-scheduling? What changes could be contemplated within regulatory proceedings at the ISO and the CPUC, to make it conducive for resources to submit economic bids instead of self-scheduling their energy?

PG&E supports the JP Proposal's strict 17 hour bid requirement, which would preclude self-scheduling of flexible resources being counted toward an LSE's resource adequacy obligation. Further incentives or penalties associated with self-scheduling would not be necessary. Additional incentives and proceedings could be revisited in the future if necessary based on the results of the current and planned changes. In addition, important CAISO efforts to improve market modeling and eliminate limitations that can otherwise hinder bidding should continue to be pursued, including multi-day optimization and expanded grouping opportunities for interlinked resources.[13]

F. Eligibility (Section 5.1)

10. According to the proposal, a resource must be able to ramp and sustain energy output for a minimum of three hours to qualify as flexible. Is this a suitable condition to determine eligibility for flexible resource? (Section 5.1) Please explain why or why not.

As previously explained in the first section of these comments, beyond 2014 a single eligibility criterion is inadequate to define flexible requirements. Because the diversity of needs for flexible capacity, it is not appropriate to use a single eligibility criterion for qualifying flexible capacity, as proposed in the JP Proposal. In addition, a single proposed eligibility requirement will unnecessarily prevent some flexible resources from counting toward operating flexibility requirements, and increase procurement costs.

[13] For example, expanded application of Physical Scheduling Plant (PSP) or Grouping Constraints processes to better accommodate resources that must be dispatched in unison, such as inter-linked hydro powerhouses.

11. Is the ISO proposed mechanism to modify the resource's master file to note flexible capacity as "dispatchable" appropriate? Please explain why or why not.

Yes. The Master File, comprised of over two hundred separate fields, already contains a flag/field titled 'Dispatchable.' It is PG&E understanding that this field is not currently meaningful, but appears to be an appropriate location to indicate if a resource has the capability to be dispatched (in the IFM and RTM, subject to start times), or not. As indicated below, key aspects of the Master File must represent the physical characteristics of a resource, dispatchable resources would necessarily be capable of responding to IFM and RTM schedules and dispatches. Contractual provisions or other aspects of flexibility could be reflected in other Master File fields.

a. What, if any, capacity procurement impacts on current resources due to the bundling requirement can be anticipated (positive and negative)? (Section 5.2)

The JP Proposal outlines that the flexible capacity that a resource offers must remain 'bundled' with the generic capacity for the specific megawatt. A flexible resource would not necessarily have to offer flexible capacity; however, such offers would necessarily be bundled with generic capacity for the flexible offer amount.

PG&E supports this approach. It has no impacts on PG&E's current resources. Unbundling would create additional implementation complexities needed to track the two attributes and potentially two buyers, and would require the development of additional policy and bidding rules to address possible conflicting uses of generic resource adequacy resources (that may be self-scheduled) and flexible resource adequacy resources (that may not be self-scheduled). The Draft Guiding Principles indicate that preferred solutions should be 'simple', 'minimize costs', and 'promote efficient procurement.' Bundling conforms to these objectives, unbundling likely would not.

12. How can the integrity of the master file be maintained?

With respect to 'dispatchability' field/flag in the Master File, to assure integrity this field/flag would be treated in the future not as a user input field but as a CAISO controlled field, similar to the present practices associated with PMax and ramp rates.

13. "Dispatchability" is as much a contractual term (i.e. bidding behavior) as it is a physical characteristic of a resource. How can generators list contractual terms in the MasterFile?

Key aspects of the Master File must represent the physical characteristics of a resource, for example PMax, ramp rate, fuel type, and dispatchability. Dispatchable resources would

necessarily be capable of responding to IFM and RTM schedules and dispatches. Contractual provisions that could otherwise place more restrictive conditions on the buyer's use of the resource would be reflected in other Master File fields.

G. Flexible Counting Conventions (Section 5.3.2)

14. Joint parties evaluated three options for counting how a resource's flexible capacity quantity would satisfy a flexible capacity procurement obligation. The three options are: 1) Pro-rate Option: Pro-rata sharing of flexible and generic capacity; (2) Differentiated Capacity Option: Distinguish flexible capacity from generic capacity; and (3) Count-all Option: Count all capacity from "dispatchable" generators as flexible.

a. Which option do you think is better and why? (Section 5.3.2)

Of the three options proposed, PG&E prefers option (2), the Differentiated Capacity Option, because it is the only option that is consistent with an approach that requires a heightened must offer obligation for resources that have committed to providing flexible capacity. From a reliability standpoint, a flexibility commitment should correspond to additional bidding/scheduling requirements so that the CAISO's flexibility needs are met. There are generators that have flexible capability but under certain system conditions may not be able to commit to a heightened must offer obligation for an entire month. Examples include hydro resources that due to weather conditions forecast that they will not be able to offer the flexibility they are sometimes capable of providing. Additionally, as renewable integration results in greater demands on thermal resources, flexible capacity may need to be managed, and in some circumstances due to air permit restrictions a generator may not be able to commit to heightened must offer obligation for all months. While it is appropriate that the resources not be able to provide flexible capacity for that month should forego eligibility to sell flexible capacity, it would be inefficient and discriminatory if eligibility to provide flexibility required that capability be provided in all months in order to count for any month.

b. What would the impact(s) be on RA contracting for each approach?

If Option 1 were adopted, it would be simple from a contracting perspective. The risk associated with the Option 1 is identified in the proposal that the flexibility for a generator that has a longer start time is above PMin and if the resource only sells a portion of its capacity, the CAISO may not actually be getting flexible capacity. As stated above, any sale of capacity by a generator would require a commitment to a heightened must offer obligation and could result in some flexible hydro or thermal being discriminated against because they would be unable to sell

generic capacity due to the inability to commit to a heightened must offer obligation for the flexibility they are eligible to provide.

If Option 2 were adopted, it would allow for generators to price their capacity differently depending on whether or not they want to commit to a heightened must offer obligation by providing flexible capacity. From a market perspective, this offers more insight into the costs of providing flexibility.

If Option 3 were adopted, it would also be administratively simple to implement as well as simple to contract. Again, there is no guarantee that the CAISO would obtain the flexibility it actually needs. The uncertainty around the CAISO's "margin" from year to year would make it difficult to manage RA requirements.

c. What would be the impact of each approach on different types of resources, and particularly on preferred resources?

No comment at this time.

15. Please comment on the proposed counting conventions for –

a. **Non-use limited thermal resources (Section 5.3.3.1)**

i. The proposal states that resources with start-up times greater than 90 minutes would be eligible to offer flexible capacity between PMin and NQC. Is 90 minutes an accurate threshold for startup time? What resources would be at an advantage or disadvantage if this threshold was adopted?

A 90 minute start-up time is a reasonable threshold to limit the amount of flexible capacity a resource can offer to between its PMin and net qualifying capacity (NQC). This threshold balances between the desire for flexible units to be available to respond to changing system conditions as rapidly as possible, on the one hand, with the desire to effectively utilize as much of the available system flexible ramping capacity as possible, on the other. Older technology combined cycle and steam generator resources will be affected if this threshold is adopted, while newer combined cycle technology will not be limited by it.

ii. What would be the impact on flexible generators with slightly longer startup time (120 minutes – 180 minutes)?

Resources with startup times longer than the threshold would be able to sell a smaller percentage of their capacity into the flexible capacity market than resources with startup times shorter than the threshold. Depending on the overall supply and demand for generic and flexible resource adequacy resources, the resulting lower revenue stream that may result for resources with startup times longer than the threshold may prove to be insufficient to cover the resources'

operating costs, and lead to the earlier retirements of resources or to their owners seeking risk of retirement funds from the CAISO.

b. Use-limited thermal resources (Section 5.3.3.3)

Use-limited thermal resources have restrictions that are related to their emissions and often get translated into running a certain number of hours. As was mentioned above, these run-time limits are based on typical operations that may differ under the two-peak per day phenomenon the CAISO has described. Emissions are related to fuel burns, including the fuel burned in start-up. Because there could be more starts for these units, they will not be able to run as many hours if they have to start up more often. The JP Proposal contemplates no special treatment for these resources, but the reduction is energy available is likely to result in bidding behavior that reflects the added costs of providing flexibility, and may not be as available on an annual basis. Consequently, substitution provisions are likely to be necessary for this type of resource. These considerations need to be taken into account when establishing the overall system need and definitions of flexibility.

c. Multi-stage generation resources (Section 5.3.3.2)

The JP Proposal suggests that the combined cycle flexibility should be based on the resource's 1x1 configuration. PG&E supports this approach. Multi-stage generation resources (MSGs) are highly flexible, and therefore it is appropriate to count MSG resources using their base configurations.

d. Hydro resources (Section 5.4)

i. The ISO and SDG&E recommend that the ISO establish a baseline output for hydro resources using the average output over the previous five years. Is using an average output appropriate and what are the other approaches that can be adopted to calculate its value?

As discussed above, PG&E opposes the JP Proposal's historic baseline approach for hydro resources and proposes an alternative. SCE has not voiced any support for this aspect of the JP Proposal, either. Looking back in time on past bidding practices and past precipitation results does not accurately reflect anticipated availability for the upcoming flexible resource showing periods.

The use of an average hydro year selected from the prior five year period represents only a limited reflection of anticipated flexible hydro capacity based on forecasted weather (precipitation). Both of these aspects of the JP Proposal would unnecessarily reduce qualified flexible capacity that would otherwise be available from hydro resources, and in doing so, create

a reliance on thermal resource alternatives as described above.

PG&E's proposed approach is instead for the hydro resource owner/agent to prospectively assess the flexible hydro monthly availability through the development and submittal to the CAISO of Availability Demonstrations within the annual and monthly resource adequacy process.

e. Intertie resources (Section 5.5)

While acknowledging that intertie resources add flexibility and ramping benefits, the JP Proposal suggests that accounting for pseudo-tie and dynamically scheduled capacity is sufficient at this initial stage. PG&E supports this approach as part of an interim solution, but emphasizes the importance of developing clear counting rules for non-resource-specific intertie capacity given that the CAISO system will likely rely on this type of capacity to some extent in meeting future ramping requirements.

f. Any other resources for which counting conventions should be developed.

16. In order to increase transparency over RA capacity procurement, what data could be made public within confidentiality restrictions?

Similar to a resource's NQC under the current resource adequacy framework, the amount of flexible capacity a resource is qualified to offer to the market should be made public if the owner of a resource desires to sell the resource's flexible capacity. For LSEs with existing contracts that include the provision of flexible capacity, a grandfathering period may be required to accommodate an LSE counting a resource's flexible capacity during the contract term if the owner chooses not to qualify the resource for flexible capacity. Similar to the process for qualifying a resource's NQC, the unit characteristics and operational data required to qualify a resource's flexible capacity should remain confidential.

a. What constraints should be imposed on sharing data such as ramp rate, PMin, PMax, or other values that may be considered confidential?

Consistent with current practices, confidential data should not be shared with market participants.

b. What are the best options to resolve disclosure concerns?

Public data should be published by the Commission and/or the CAISO. Confidential data should be treated according to existing Commission rules or CAISO tariff provisions.

c. What tariff or BPM rules restrict data release?

PG&E defers to the CAISO on this question.

17. Should there be different qualitative and quantitative metrics of flexibility for demand response and storage resources?

No, there is no need for different qualitative and quantitative eligibility requirements or flexibility metrics for demand response (DR) and storage resources. The eligibility requirements for different types of flexible capacity should reflect the needs of the system. However, based on the system's need for operational flexibility, eligibility requirements and counting rules for flexible capacity should be designed to take advantage of energy- or use-limited resources such as hydro, DR and energy storage so that they can contribute to the system's operational flexibility. The initial metrics for conventional resources set forth in the JP Proposal may need some modification so that DR and storage resources can provide additional value for the longer term.

a. If so, what characteristics or criteria could be used to quantify flexibility for storage devices and demand response?

While providing flexibility should be technology neutral, each technology can have unique characteristics that need to be addressed regarding counting toward the flexibility requirement. This is the case with DR and storage. PG&E agrees with the JP Proposal[14] that counting conventions and market rules for preferred resources should be addressed after they are addressed for conventional resources.

However, PG&E recommends that a specific DR focused evaluation be done immediately following the establishment of the rules for conventional resources (Proposed for June 2013 in the Scoping Memo). In that way the DR rules can build upon what is learned from the development of conventional resources, particularly use-limited resources and hydro. This could target a September 2013 timeframe for defining specific DR requirements that could be approved in the 2014 resource adequacy proceeding and utilized for meeting the 2015 resource adequacy requirement.

This timing would allow qualifying flexible DR products to be included in the 2015-2017 DR application that will be filed in January of 2014, and in the next DR aggregator request for proposal (RFP) planned for late 2013, that will have contracts that start in 2015.

There are some questions that should be addressed now to get the process going. Some initial questions include:

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[14] JP Proposal, p. 24.

- Typically a demand response program does not have a ramp rate, but instead the load drop must take place over a specified period of time, i.e. the notification time (e.g. 30 minutes). Can this approach meet the CAISO needs?
- The Flexible Capacity product is only needed at a system level,[15] so can a system-wide or local DR product be used to provide this service? Proxy demand resource (PDR) is now only at the SubLAP or smaller level.
- How does DR that increases load to help deal with over-generation count toward meeting an LSE's flexible resource obligation?
- How will DR that provides ancillary services such as non-spin, spin and regulation be counted? Developing these DR resources will free up conventional generation to provide more flexible ramping, so it would seem that there is value to having this type of DR count toward flexibility obligations.
- Can the 17 hour requirement be reduced to a 3 hours window for each specific month for DR? The DR resources available in each hour of the day can vary significantly (that is partly what creates the need for the ramping) and so it will be much easier to target DR to those hours that actually need the ramping only.
- Is there some portion of the ramping requirements that can be met with resources that can only be dispatched a limited number hours per month? As an example, suppose that the last 100 MW of ramping is likely to only be needed for 1 to 5 days per month. Could that part of the flexible resource adequacy obligation be met with a resource that is only available to be dispatched 5 days per month for a total of 15 hours (5 events of 3 hour duration)?

These and similarly foundational questions should be addressed in this resource adequacy proceeding.

b. What demand response programs or types are most suitable for flexible resource eligibility?

This needs to be further investigated. While some existing and planned DR program may help address the flexibility requirement, it is likely that new types of demand response programs will need to be developed to meet these needs.

H. General

18. What are the specific impacts of the flexible capacity procurement initiative on procurement and contracting on Community Choice Aggregators and Electric Service Providers?

PG&E has not comments at this time. However, in general all LSEs should be required to satisfy their proportionate share of the flexible capacity requirements.

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[15] JP Proposal, p. 11.

Respectfully Submitted,

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