

# Stakeholder Comments Template

# Flexible Resource Adequacy Criteria and Must-Offer Obligation Fourth Revised Straw Proposal, Posted November 7, 2013

Submitted by	Company	Date Submitted
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NGK Insulators, Ltd. ("NGK") is a large international firm focused on the power, ceramics and electronics businesses. NGK is the manufacturer of the NAS battery system that is proven in commercial operation. Globally, more than 300 MW of NAS battery capacity at over 170 projects with 6 to 7 hours of energy storage (over 2100 MWh) are currently in operation and additional projects are in development.

MegaWatt Storage Farms, Inc. ("MegaWatt") is a storage advisory firm. MegaWatt prepared these comments on behalf of NGK.

NGK commends the work of the CAISO, CPUC and the parties that developed this Fourth Revised Proposal ("Proposal") for flexible resource adequacy, including consideration of the flexibility that can be provided by electricity storage projects.

NGK's responses to the ISO's questions on the Proposal are highlighted in blue below. These responses are generally applicable to most multi-hour battery and other fast, multi-hour storage technologies.

 The ISO has outlined a methodology to allocate flexible capacity requirements to LRAs. As detailed in the fourth revised straw proposal<sup>1</sup> and at the 11/13 stakeholder meeting PG&E has put forward an alternative allocation methodology. Please provide comments for each of these proposals, particularly as they relate to cost causation. If your organization has a preference for one over the other, please state your preference and why.

NGK has no preference with respect to the allocation of flexible capacity requirements to LRAs.

However, NGK urges the CAISO to maintain the use of three-hour criteria as a benchmark for flexible capacity need evaluation and also to recognize that the need is for two ramps per day (a morning and an evening ramp). Resources that

<sup>&</sup>lt;sup>1</sup> PG&E's specific proposal can be found at <u>http://www.caiso.com/Documents/PG\_E-Comments-FlexibleResourceAdequacyCriteriaMustOfferObligation-ThirdRevisedStrawProposal.pdf</u>.



cannot ramp up and down twice per day when required should be granted a lower Effective Flexibility Capacity (EFC) than those that can ramp twice per day. Hydro resources are already required to provide six hours of storage to qualify as flexible capacity.

 The ISO believes that demand response resources should have the opportunity to provide flexible capacity. The ISO has proposed how demand response resources could do so. Please provide comments on the ISO's proposal. Specifically, please identify concerns with the ISO's proposal and offer potential solutions to these concerns. Additionally, please comment on the proper forum (ISO, CPUC, etc.) where these concerns should be addressed.

NGK supports the use of all flexible resources for meeting the ISOs dispatch flexibility needs. However, all resources are not equal in meeting the ISOs flexibility needs and those resources that provide lesser availability, responsiveness, and duration should be assigned a lower Effective Flexibility Capacity (EFC) than fully flexible, fully available, multi-hour, two-way storage resources. Since the baseline for demand response compensation typically involves estimation and many demand response programs have customer optout provisions; such factors need to be accounted for by downward adjustments to the demand response resource EFCs. And demand response resources should also be required to be aggregated to provide twice per day ramping up to 3 hours or be assigned a lower EFC if only once a day is provided.

- 3. Please provide comments and recommendations (including requested clarifications) regarding the ISO's proposed must-offer obligations for the following resources types:
  - a. Dispatchable gas-fired use-limited resources
    - 1. Please provide comments regarding the ISO's proposal that would allow resources with use- limitations to include the opportunity costs in the resource's default energy bid, start-up cost, and minimum load cost.

The Proposal awards a generator with a start-up time of up to 90 minutes with an EFC between zero and its NQC as limited by its ramp rate. Such a resource should not be awarded an EFC that is equivalent to a fast start generator or an always on, instantaneous dispatch resource such as battery storage.

2. Please provide information on any use-limitations that have not been addressed and how the ISO could account for them.



NGK has no comment.

- b. Specialized must-offer obligations:
  - 1. Demand response resources

Demand response resources should be required to provide 3 hours of energy in both the morning and evening ramps and not just either the morning or evening net load ramp. If only one daily ramp is provided by a resource, their EFC should be reduced by about 50%.

## 2. Storage resources

The ISO is proposing that energy storage resources elect one of two options for providing flexible capacity and for determining their EFC: (1) Regulation Energy Management (REM) or (2) Fully Flexible Capacity (FFC).

REM requires only 15-minutes of energy storage. The Proposal is that FFC require at least 3 hours of storage. The Proposal awards the same EFC to both REM and FFC and both are paid the same incentive price. As we show below, this does not make sense.

The CPUC in its AB 2514 decision adopted a storage procurement target of 1,325 MW for 2020 (operation by 2024) for the three investor owned IOUs. Other Load Serving Entities (LSEs) in the ISO footprint will also have storage obligations. The total for all ISO LSEs would be approximately 1,500 MW. These storage targets are allocated to each LSE by year.

Under the ISO proposal the CPUC storage target may be interpreted as being satisfied by either the REM or the FFC storage as defined by the Proposal. REM 15-minute storage obviously will require less investment than 3-hour FFC storage; so LSEs may procure only REM 15-minute storage to meet their storage target.

Clearly, the ISO cannot effectively use 1.5 GW of 15-minute REM storage. Recognizing that fully flexible storage and generation also provide regulation services, the ISO at most, may efficiently use an additional 100 MW of 15-minute REM regulation capability by 2020; this would be about 7% of the 2020 LSE storage target. NGK therefore proposes that the contribution of storage REM to flexible capacity be capped at 7% of each LSEs annual storage obligation under AB 2514.



In previous comments NRG, SCE, and PG&E, have also questioned the basis for 15-minute REM storage as a flexible resource.

A FFC battery storage resource, as defined in the Proposal, with 3 or more hours of storage can provide nearly instantaneous (less than 1 second) ramping from its full negative Pmin charge state to its full Pmax MW discharge state for at least 3 hours. Typically this is about twice its 0 to Pmax range. Clearly, such flexibility needs to be recognized by setting the Effective Flexible Capacity (EFC) of fully flexible storage with 3 or more hours of storage at its negative Pmin to Pmax range. The current Proposal discriminates against such storage by only recognizing its EFC over its discharge MW range from 0 to Pmax.

The ISO has publically stated its concern with the increasing down ramp requirements. FFC storage with at least 3 hours of storage, will address both up and down ramps which is another reason to recognize is EFC over its full negative Pmin to Pmax range.

A fully flexible, 3-hour plus storage resource with twice a day capability will lift the mid-day belly of the ISO duck curve by charging as well as lower the evening head of the duck by discharging and thereby reduce the 3-hour net load ramp by is full negative Pmin to Pmax EFC. It will then reduce the down ramp in the late evening and absorb excess night energy. And by raising the early morning net load by charging and then discharging during the morning ramp and over the morning peak reduce the morning ramp and the need to commit more fossil generation.

And on another day, when 4-hour mid-day generic RA capacity is needed a 4hour storage battery can be dispatched to meet an LSE RA capacity requirements. And when it is not dispatched to consume or produce energy it can provide regulation, other ancillary services, voltage support and 5-minute load following.

NGK therefore supports a requirement for FFC resources of both morning and evening ramps and not either morning or evening ramps with a total daily discharge requirement of six hours, just as the Proposal requires for hydro resources. Resources that cannot provide this six hour discharge (3 hours, twice per day) capability should be awarded a lower EFC.

3. Variable energy resources

NGK has no comment.



4. At the 11/13 stakeholder meeting there a significant amount of discussion regarding the appropriate method for setting the price for the proposed flexible capacity availability incentive mechanism. Please provide comments about how this issue might be resolved.

NGK suggests that the ISO clarify that the price for flexible capacity availability is intended as an incentive to offer this capacity into the ISO DA and RT markets for dispatch by the ISO. The incentive is not designed to incent the development of new or the retention of existing flexible capacity.

NGK suggests a modification to the proposal on the assignment of EFC to each resource. The assignment of the EFC has a significant impact on the required capacity availability incentive price.

The gold standard for flexibility should be the "perfect resource" rather than the "perfect generator". (This was advocated in previous comments by DECA). Such a perfect resource is a perfect storage resource with a negative Pmin and a positive Pmax. The EFC for this resource would be its (Pmax – Pmin). For example a 100 MW storage resource that can discharge and charge at 100 MW can provide 200 MW of flexible capacity. The "perfect resource" would ramp up or down over the full Pmax – Pmin MW range in less than 1 second. The perfect resource would have infinite storage, but as a practical matter 3 hours of storage dispatchable twice per day would be a reasonable current definition given the projected maximum ramping needs of the ISO. The required availability for discharge and charge of this perfect resource would be all hours of the year.

If the perfect resource is to also provide Generic RA then it will need at least 4hours of discharge capacity; once per day, three days in a row.

The perfect generator with zero Pmin, 24/7 availability, and full ramp in less than a second would be awarded an EFC of Pmax – Pmin MW where the Pmin is 0. This will be about 50% of a perfect storage resource EFC. Real generators, storage resources with less than 3 hours of energy storage dispatched twice per day, non-zero Pmin, slower startup and ramp, and lower availability, and the various DR resources each would be awarded an EFC that is percentage of the perfect storage EFC based on CPUC/ISO modeling studies.

The price for the proposed flexible capacity availability incentive should be relatively high for the perfect storage resource, and should be set so that all necessary flexible resources have the required availability incentive (flexibility price times the EFC) necessary to meet ISO flexible dispatch needs. Looking to current real-time market results at a time when the full impact of increased renewables is not yet in the market, and when the market currently has a



capacity surplus, seems likely to underestimate the required price for Flexible RA.

Furthermore, with a surplus of Generic RA capacity, the incentive price for Flexible RA may become the primary capacity incentive and therefore need a relatively high incentive price.

- 5. The ISO has proposed an SFCP evaluation mechanism/formula that weights compliance with the real-time must offer obligation heavier than the day-ahead must offer obligation. Please comment on:
  - a. The merits of using such a weighting mechanism relative to the "lesser of" proposal from the previous proposal

NGK supports compliance with both day-head and real-time must offer obligations.

b. The relative weights between the real-time and day-ahead markets

NGK support the 80/20 proposed weights for real-time/day-ahead compliance.

6. There were several clarifying questions asked at the 11/13 stakeholder meeting regarding substitution of flexible capacity that is on forced outage. Please provide comments and / or questions (and potential answers) regarding any additional clarifications the ISO should make in the next revision to clarify this aspect of the proposal.

### NGK has no comment.

7. Please provide comments regarding how, or if, the SFCP adder price and the flexible capacity backstop price should be related.

### NGK has no comment.

8. Are there any additional comments your organization wishes to make at this time?

NGK has no additional comments at this time.