

# Stakeholder Comments Template

## Subject: Reactive Power and Financial Compensation

| Submitted by   | Company                             | Date Submitted                   |
|--|-------------------------------------|----------------------------------|
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This template has been created for submission of stakeholder comments on the Straw Proposal for the Reactive Power initiative was posted on August 13, 2014. Please submit comments to [initiativecomments@caiso.com](mailto:initiativecomments@caiso.com). Submissions are requested by close of business on **September 3, 2015**.

### **Introduction**

The Large-scale Solar Association (LSA) appreciates the opportunity to comment on the CAISO's August 13<sup>th</sup>, 2015 document, Reactive Power Requirements & Financial Compensation – Straw Proposal (Proposal), and the discussion of the Proposal on an August 20<sup>th</sup> stakeholder conference call.

As LSA stated in its comments on the earlier issue paper, the CAISO's effort to review interconnection standards and assure adequate system performance as major changes occur in the generation-fleet composition has the potential to benefit all CAISO grid users by ensuring that the CAISO has access to additional grid-management tools and capabilities to accommodate those changes. LSA does not object to reasonable standards and agrees that technical improvements in recent years has improved the ability of asynchronous generators to meet such standards and lowered the costs to do so.

However, as FERC ruled on the CAISO previous proposals, the CAISO should still have to demonstrate the need for any new requirements, and limit new requirements to those needed to meet those demonstrated needs.

Unfortunately, the CAISO has not provided any substantive study of future reactive power needs. Thus, based on information to date, the CAISO may not really know if it needs the additional proposed capability, or conversely, if that capability will fully meet its needs.

On the one hand, the CAISO might not need additional capability:

- The CAISO is getting considerable capability from existing resources, i.e.: (1) 100% of synchronous capacity; and (2) the 70% of asynchronous capacity typically subject to reactive requirements as a result of CAISO interconnection studies.
- As multiple stakeholders have pointed out, reactive power and voltage support needs are largely localized. The additional 30% of asynchronous capacity that would not have had to meet the standards absent the blanket requirement would likely be located in "stronger" areas of the grid, where the need for additional capability is probably lower.

On the other hand, the CAISO may need more reactive power capabilities than this proposal will provide:

- The incremental capability – from Cluster 9 forward, for the 30% of generation capacity that would probably not be required to meet the standards under the current study approach – is relatively small, since most generation needed to meet 33% RPS (and probably some portion likely to be contracted to meet the difference between 33% and 50% RPS) is already in the queue. (Also, as noted above, the additional capability would probably be located in relatively stronger parts of the grid.)
- The severe limitation of the capability-payment in the Proposal removes any incentives for additional voluntary compliance, e.g., in areas where that capability might be needed, from: (1) existing or new generators subject to the requirement who could provide any more than the minimum amount of reactive capability; or (2) existing generators that were not subject to requirements under the study-based approach but could do so voluntarily.

In short, if the CAISO wants to depart from the current one-off study-based approach, it should first perform a rigorous analysis of the amount and likely locations of its future reactive capability needs.

While such an examination may not be able to consider any and all future scenarios, the CAISO can use the results to craft a more calibrated set of requirements that it can be reasonably sure will meet its future needs, without imposing unnecessary costs on suppliers for reactive capability that is not needed. The SONGs closure example cited by the CAISO in the issue paper demonstrates that the CAISO can manage additional needs due to very rare and significant unexpected future changes to the grid through the annual Transmission Planning Process (TPP).

Finally, the proposed new requirements should also be fair, clear, achievable, and provide for the least-cost means of achieving the desired objectives. The Proposal leaves differences between synchronous and asynchronous generator requirements that are not justified, and it does not address the justification for and cost of the dynamic reactive capability requirements.

### **1. Please provide feedback on the financial compensation for reactive power.**

LSA remains pleased that the CAISO has made financial compensation a central issue in this initiative. As LSA said in comments on the issue paper, this issue is especially important for solar generators. However, LSA opposes the changes in the Proposal.

#### **Capability payment structure**

The Proposal would restrict capability payments solely to generators entering the queue in the future that can demonstrate that they are not already receiving compensation (e.g., through their Power Purchase Agreements (PPAs) or other commercial arrangements. The CAISO justifies this pullback by citing concerns about double payments and assertions that

**Stand-Alone Network Upgrades (SANUs)/Self-Builds** existing resources subject to reactive/voltage requirements are already compensated for it.

LSA recommends that the CAISO reinstate capability payments to existing resources, for the reasons explained below.

First, it is not possible to determine whether the costs to comply with existing requirements are covered under existing PPAs. PPA selection is bid-based, so projects with such requirements had to bid against projects that are not subject to them. Projects with such requirements that were selected for PPAs basically had to absorb the additional costs – as with other location-specific costs – and the projects were thus just that much less profitable. The fact that these projects had to provide the service for free under their PPAs is not a reason to exclude them from market compensation payments.

Second, as WPTF pointed out on the conference call, this “justification” cannot apply in some situations, e.g., projects without PPAs, or contracts (e.g., for unbundled Resource Adequacy capacity) that specifically exclude reactive-capability compensation.

As a separate matter, there is no apparent reason to put the burden of proof on the supplier, for existing or new resources. The utilities are correct that future PPAs and other agreements will likely contain more specifics about reactive compliance costs if the Proposal is adopted, but where they do not, the buyers for these contracts can prove that the compensation includes such compliance costs by providing information on how the contract prices were determined. The same is true if, as LSA recommends, the CAISO reinstates provision of capability payments to existing resources.

Finally, as noted above, financial compensation – even cost-based compensation – can incent the approximately 30% of asynchronous generation not required to meet the power factor requirements to date to install such capability, or those complying with the minimum requirements to provide additional capability, using the provisions recently approved through BPM PRR 825 (allowing up to 10% oversizing of inverter capability).

As with provision payments (see below), LSA believes that capability payments to existing generators will have to be made directly to generators, and not their Scheduling Coordinators, in order to avoid the need for widespread PPA revisions. The CAISO can use its current payment systems to implement these direct payments far easier and cheaper than the significant efforts needed for PPA revisions.

### **Provision payment structure**

The current CAISO tariff payment formula for “opportunity costs” to provide reactive power outside the specified ranges is based on Locational Marginal Prices (LMPs) and a determination of whether any energy curtailed to provide the service would have cleared the energy markets. However, this formula does not reflect the realities of how asynchronous generators are paid.

For most asynchronous generators, the variable “cost” is mainly lost PPA payments. Most PPAs for asynchronous generators contain per-MWh payments only, so fixed costs as well

as variable costs are recovered in energy payments; thus, the entire amount of the PPA payment is lost.

LSA understands the concerns expressed about possible CAISO interpretation of PPAs if provision payments were based on PPA payments. Instead, LSA suggests that the CAISO avoid the need for that interpretation by broadening its current relationship with Potomac Economics to include establishment of project-specific provision payments. Potomac already examines generator-specific operations and other complex data to establish project-specific negotiated Default Energy Bids (DEBs), and it could do the same for provision payments.

This would not be a difficult addition to the current Potomac scope of work. Determining project-specific provision payments based on PPAs should be far easier than calculating DEBs, since most PPAs for asynchronous generators have very simple per-MWh payment structures.

## **2. Please provide feedback on the effective date proposal.**

The CAISO should set the new requirements to begin with Cluster 9, and any ISP or FT applications submitted after the close of the C9 application window.

The CAISO should not impose the new requirements on earlier-queued projects where GIAs were not tendered or “substantially negotiated” before the rules are effective, as suggested by the CAISO and SDG&E on the conference call. By that time, the developer may have already bid the project, and it could even be short-listed. Changing requirements mid-stream would be extremely disruptive to the development process.

If the CAISO is concerned that there might not be enough generation subject to the new requirements to meet its needs, it should provide incentives for broader voluntary compliance before expanding the mandatory standard. As discussed above, additional capability could be provided by: (1) existing or new generators subject to the requirement that could provide any more than the minimum capability; or (2) existing generators that were not required to meet the requirements but would be willing to do so voluntarily.

## **3. Please provide any feedback on reactive power technical requirements.**

LSA continues to have concerns – listed below and then explained further – about the content and process of the Proposal. Many of these concerns were expressed in LSA’s comments on the earlier issue paper, but they have yet to be addressed.

Specifically, the CAISO should do the following:

- Conduct an assessment of its reactive power/voltage support needs and design requirements that will meet those needs, and address in the annual TPP situations where additional needs later arise. (This issue was addressed in the Introduction above and is not discussed further below.)

- Commit to revising any standards adopted in this initiative to conform to NERC/WECC rules and standards that are eventually adopted.
- Clarify the dynamic response timing requirements.
- Explain how interconnection studies and/or TPP will be revised to consider situations where the standards could be met more economically and/or efficiently collectively: (1) behind the POI; and (2) beyond the POI, through grid-level investments.
- Provide asynchronous generators the option to meet either the current synchronous generator standard or the proposed asynchronous generator standard.
- Include flexibility to fairly address situations where compliance would be difficult and/or costly.

### **NERC/WECC conformance**

As noted in LSA's earlier comments, the CAISO should explicitly recognize NERC/WECC efforts toward more uniform standards across the West and nationally in the future and should commit to complying with such standards. The applicable CAISO rules should not be more stringent than applicable standards adopted by NERC/WECC, unless the CAISO can show that its stronger requirements are needed for the CAISO Controlled Grid.

### **Dynamic response timing**

The Paper states that dynamic response "should be similar to a synchronous resource, i.e., within one second, to support the system during transient response events." However, the CAISO's definition of "within one second" is not clear. For example, does that timing include an event recognition time, rise time and voltage settling time?

In addition, that phrase does not accurately reflect current dynamic response requirements for synchronous resources. There are a variety of Automatic Voltage Response (AVR) designs for synchronous resources, and they have different response capabilities to support transient events. Also, synchronous resources with power system stabilizers (PSSs) will have a faster response than generators without PSSs.

### **Collective standards compliance**

The CAISO should explicitly provide for identification of situations where its needs could be more economically and/or efficiently met collectively instead of separately by each generator, both behind and beyond the Point of Interconnection (POI). These opportunities could be considered in interconnection studies and/or the TPP, and LSA agrees with CalWEA that the CAISO should better explain how those processes will be revised to identify and implement those opportunities.

### **Differences between current synchronous generation requirements and proposed asynchronous generation requirements**

These current synchronous generator requirements and the proposed asynchronous generator requirements differ in both the power-factor standards and the location where they must be met, as shown below.

| <i>REQUIREMENT</i>       | <i>SYNCHRONOUS</i>  | <i>PROPOSED ASYNCHRONOUS</i>   |
|--------------------------|---------------------|--------------------------------|
| Power-factor requirement | 0.95/0.9 lead/lag   | 0.95 lead/lag                  |
| Location                 | Generator terminals | Point of Interconnection (POI) |

The Proposal tries to explain that these standards are “equivalent” and “comparable,” but the CAISO has not provided an adequate explanation of why they should be different. The Proposal says that asynchronous generators could meet the requirements at other locations, with the consent of the CAISO and Participating Transmission Owner (PTO), but it does not explain the criteria that would be used to grant that consent.

In response to questions on the stakeholder conference call, the CAISO stated the following:

- The CAISO thought it would be “easier” for asynchronous generators to meet the requirements at the POI.
- There might not be “too much difference” between 0.95/0.90 power factor at the generator terminals and 0.95/0.95 power factor at the POI.
- Compliance might be more difficult to determine if the requirement is met at the generator (inverter) terminals. However, the reason why this problem would apply only to asynchronous generators was not explained.

If the difference is given for the benefit of the generator, and there is not much difference between the standards, why not use the same one for both? In other words, why not allow all generators to meet either a 0.95/0.90 standard at the generator terminals (for solar projects, at the inverter terminals), with compensation to the POI, or 0.95/0.95 at the POI?

In addition, the CAISO has not explained why the PJM standard, which imposes a uniform requirement at the generator terminals, would be problematic for the CAISO. Meeting the standard at the POI could require additional equipment that would raise compliance costs (and, therefore, payments under the proposed cost-based capability-payment structure).

In short, the CAISO has still not justified the different standards for different generator types, and/or why providing a choice to developers would cause problems for the CAISO.

#### **Flexibility where meeting the standard might be very difficult or complicated**

As noted in LSA’s prior comments, the CAISO should provide for exceptions or special arrangements, for example, for situations where:

- The POI is remote from the generator site (much more common for asynchronous generators than synchronous generators);
- Several generating projects could meet the requirement collectively, as described on the conference call;
- Some generators on shared gen-ties are subject to the standards while others are not;
- Generators are interconnecting to busses where there is already a regulation device installed (i.e. either distribution interconnections or a device such as an SVC); or

- A generating project cannot effectively control the transmission voltage, e.g., a small generator connecting to a stiff high-voltage system (i.e., where the project is small compared to the short-circuit MVA of the system).