

## Stakeholder Comments Template

### Subject: Reactive Power and Financial Compensation

Submitted by	Company	Date Submitted
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Southern California Edison (SCE) appreciates the opportunity to comment on the California Independent System Operator's (CAISO) May 22 Reactive Power Requirements (RPR) and Financial Compensation Issue Paper<sup>1</sup>. In general, the CAISO's proposal entails, on a prospective basis, applying a constant requirement for all asynchronous resources to provide reactive power capability and voltage regulation, supplanting the current system impact study approach to determine whether such generators should be required to provide reactive power. The May 22 Issue Paper also considers financial compensation for market resources for both the capability to provide reactive power and the provisioning of reactive power outside of a prescribed range. The CAISO proposes compensating resources with a capability and a provision payment. The CAISO also asks stakeholders to opine on compliance, testing, and cost allocation.

***In summary:***

- SCE supports putting synchronous and asynchronous resources on equal footing with respect to the provisioning of reactive power and voltage regulation;
- SCE supports replacing the requirement to perform system impact studies to identify reactive power needs with the requirement that all resources provide reactive power;

<sup>1</sup> [http://www.caiso.com/Documents/IssuePaper\\_ReactivePowerRequirements\\_FinancialCompensation.pdf](http://www.caiso.com/Documents/IssuePaper_ReactivePowerRequirements_FinancialCompensation.pdf)

- SCE supports not applying separate rules to wind resources and other asynchronous resources such as solar photovoltaic or battery storage;
- SCE supports the prospective application of standards that are consistent with those in place for synchronous resources;
- SCE is concerned with oversizing of or installing extra inverters to meet reactive power requirements;
- SCE does not believe that new Power Purchase Agreements (PPAs) would be the appropriate enforcement vehicle of reactive power and voltage regulation capabilities, but rather enforcement should reside in the CAISO Tariff and Generation Interconnection Agreements (GIAs), with which PPAs require generators to comply;
- SCE does not support a capability payment but does support a provision payment;
- Resources should be made indifferent between providing real power or reactive power, to assure appropriate compliance incentive;
- Any resource that does not obey the CAISO's dispatch should forfeit compensation; and
- Cost allocation for provision payment should be consistent with the CAISO's current allocation for voltage support.

1. Please provide feedback on the reactive power technical requirements.

Overall, SCE supports the CAISO's reactive power technical requirements and largely reiterates comments previously submitted concerning both the CAISO's March 5, 2015, Reactive Power Requirements for Asynchronous Resources Issue Paper and Straw Proposal as well as the April 22, 2015, technical working group meeting.

**Reactive Power Capability Should be a Uniform Requirement for all Resource Types**

SCE supports establishing, similar to the existing rules for synchronous resources, and as a prerequisite for interconnecting safely and reliably to the electric grid, a requirement that asynchronous resources have reactive power and voltage regulation capabilities. Conventional synchronous generation resources have been the primary source of reactive power on the

transmission system. From an equity standpoint, it is not fair for asynchronous resources to depend parasitically on conventional generation resources or some other source to ensure the existence of an electrically stable grid. As asynchronous resources continue to displace synchronous generators, it has become increasingly critical that an equilibrium supply of reactive power be readily available to achieve voltage regulation through either the production or absorption of reactive power, depending on the prevailing system conditions. Reactive power and voltage regulation capability should not be the responsibility solely of synchronous generators, but rather a requirement of both synchronous and asynchronous generators.

### **SCE Supports a General Reactive Power Capability Requirement, with no System Impact Studies**

SCE supports the imposition of a general reactive power requirement on asynchronous resources. SCE agrees with the CAISO that a system impact study may not require that every project provide reactive power capability because the results may conclude that there will be sufficient reactive power on the transmission system due to the capabilities of the existing generators and other reactive power devices. The CAISO's premise, "a glaring weakness with this approach is that such a study cannot reasonably anticipate all operating conditions in which resources with reactive power capability or reactive power devices on the transmission grid will be out of service – either due to retirement, or forced or planned outage – at the time reactive power needs arise" is right on mark. The case-by-case approach relies heavily on the assumptions of future condition, which may not prove true". More importantly, as the CAISO indicates, "while transmission providers can mitigate (regulation deficiencies) by authorizing new transmission elements, this process involves an unavoidable time lag (March 5, 2015, Issue Paper and Straw Proposal at page 18)."

The requirement to provide reactive power and voltage regulation capability should be the same for all asynchronous resources, with no disparate rules for these resources depending on whether they are wind or solar-fueled generators, or battery storage.

### **SCE Supports Applying New Reactive Power Rules on a Going-Forward Basis**

SCE supports the application of new standards regarding reactive power requirements for asynchronous resources on a prospective basis. Given the current stakeholder process schedule,

the CAISO intends to request approval of its final proposal at the November 2015 CAISO Board meeting. Allowing sufficient time for tariff revisions to become effective, resources seeking to interconnect in Queue Cluster 9 in April 2016 would be the earliest cluster potentially impacted by these new rules. It would be appropriate to exempt projects already in the interconnection process or already interconnected for the remaining life of the existing generating unit. Replacement or repowered generating units should adhere to these new requirements.

### **SCE is Concerned with Oversizing Of or Installing Extra Inverters to Meet Reactive Power Requirements**

SCE is concerned that developers who choose to oversize or install more inverters to meet reactive power requirements may produce more real power than was studied for the market resource through the interconnection process. Oversizing or extra inverters should only be allowed if the possible over-production issue is first addressed. Instead, SCE believes that an asynchronous project can be designed in such a manner as to install static mechanically switched reactive power devices (such as capacitor banks) for steady-state control to provide the reactive power needed for internal project losses to the Point of Interconnection and rely on dynamic response of inverters sized to coincide with the requested interconnection amount. Additional controllable external dynamic devices (e.g., D-Stat devices) can be installed internal to the asynchronous project to augment the dynamic response capability if required. This would eliminate potential over-generation values, greater than the MW studied in the interconnection process, and would eliminate need to regulate or “police” potential for such over-generation.

### **Reactive Power and Voltage Regulation Capabilities Should Not Be Required in PPAs**

SCE does not believe that PPAs would be the appropriate enforcement vehicle of reactive power and voltage regulation capabilities. The main function of a PPA is to provide for the sale of energy (as measured in kw-hours or MW-hours) but not to govern the operation of the generating facility as it pertains to the Bulk Electric system requirements. The proper vehicle to articulate operational requirements is the CAISO Tariff and the Generation Interconnection Agreement (GIA). In fact, Appendix C of the current GIAs addresses such operational requirements. SCE’s PPAs require generator owners to abide by the CAISO Tariff, and therefore should not be, nor must they be, the driver of generators’ provision of these capabilities. If CAISO’s primary

concern is that new build generation will not be able to provide reactive power and voltage support, that issue would be more appropriately addressed as a breach of the GIA. The Interconnection Customer would need to cure such deficiencies or risk disconnection until mitigated by the Interconnection Customer.

### **SCE Seeks Clarification on Response Time Associated with the Proposed VAR Requirement**

SCE seeks clarification regarding response time with the proposed VAR requirement. A definition of the terms “Dynamic” and “Static” VARs that includes a response time requirement would more clearly describe the requirement. SCE recommends that the CAISO clarify this gap by providing language that reads, “The plant must provide 0.95 ‘static’ VARs within [number] of seconds.” In addition, “The plant must provide 0.985 ‘dynamic’ VARs within [number] of cycles.”

### **Proposed Revisions to Attachment 2**

Attachment 2 (p. 28) of the CAISO’s March 5, 2015, Issue Paper and Straw Proposal contains seemingly typographical errors that have important implications and SCE recommends they be corrected as follows:

"...the Asynchronous Generating Facility shall have the capability to provide reactive power at 0.95 lagging when voltage levels are between 0.90 per unit and **1.0 per unit voltage unity power** at the Point of Interconnection" *And*

"...the Asynchronous Generating Facility shall have the capability to absorb reactive power at 0.95 leading when voltage levels are between **1.0 per unit voltage unity power factor** and 1.1 per unit at the Point of interconnection"

2. Please provide feedback on the financial compensation for reactive power.

**SCE supports a provision payment – SCE does not support a capability payment*****California bilateral contracting compensates for all attributes of generation***

The CAISO has proposed compensating generators for the capability to provide reactive power. In part, the CAISO has supported this position by citing other ISOs as providing capability compensation to their generation<sup>2</sup>. The compensation of capability by other ISOs is not sufficient to support such a mechanism in California where there are fundamental structural market differences. Other ISOs have capacity markets which are absent in California. Capacity markets enable separation of capacity versus capability costs, allowing targeted compensation for each attribute. In contrast, California uses a variety of bilateral contracts<sup>3</sup>. These bilateral contracts, with the vast majority of California generators, compensate resources for providing all of their attributes – real power, as well as reactive. Further, these contracts represent a variety of options through which generators provide these attributes to California load. Finally, these contracts also ensure appropriate compensation to generators for every physical characteristic that a generator has – energy, capacity, voltage support, etc. Within these contracts, all attributes can be procured, placing no restrictions (beyond physical limitations) on the provision of any service or product. Since all attributes of a resource are contracted and compensated, there is no need for the CAISO to additionally compensate generators for such features within the CAISO market.

***Implementing a capability differentiating mechanism in the presence of an all-attribute compensating mechanism is unnecessary and inconsistent***

A separate compensation mechanism attempts to differentiate an already included feature, thereby creating a disconnect in compensation mechanisms. It is neither efficient nor appropriate to have a mechanism that considers all attributes of a resource function alongside another

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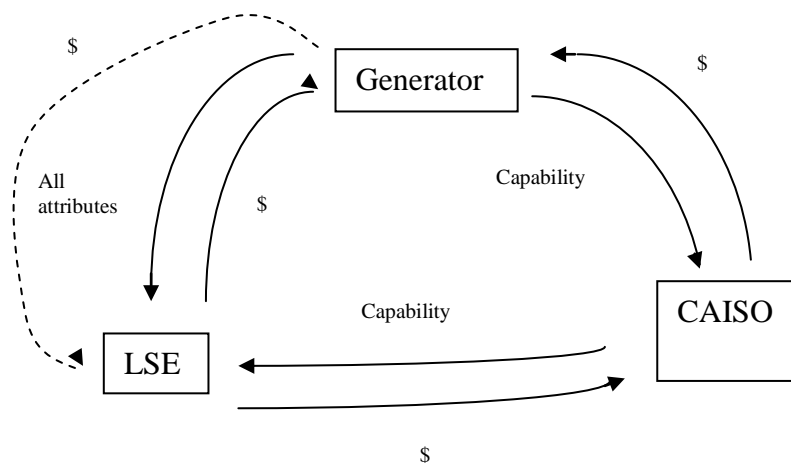
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[http://www.aiso.com/Documents/Agenda\\_Presentation\\_ReactivePowerRequirements\\_FinancialCompensation\\_IssuePaper.pdf](http://www.aiso.com/Documents/Agenda_Presentation_ReactivePowerRequirements_FinancialCompensation_IssuePaper.pdf)

<sup>3</sup> A non-exhaustive list of these includes Resource Adequacy (RA), Renewable Auction Mechanism (RAM), Combined Heat and Power Request for Offers (CHP RFO), Eligible Renewable Resource (ERR), Power Purchase Agreement (PPA), Photovoltaic Standard Contract (PVSC), Qualifying Facilities (QF) Settlements, Renewable Standard Contract (RSC), and Tariff contracts.

mechanism that focuses only on a single attribute. Further, any external compensation amounts to potential double-payment for the same attributes.

In general, the reactive power provision mechanism proposed by the CAISO would be:



A generator would be contracted by an LSE for all its attributes (real capacity and reactive power capability are included). It would receive a payment from the LSE for those attributes. The generator would then be contracted by the CAISO for reactive power capability and would receive a payment from the CAISO for that attribute. Finally, since the CAISO has to maintain revenue neutrality, it would collect the capability payment from the LSE. Not only is the generator being paid twice, but also the LSE is being charged twice for a service it already procured. The best case and simplest resolution to this would be that the LSE↔generator contract passes any CAISO payments back to the LSE, as shown by the dotted line in the diagram above. This still amounts to a convoluted, roundabout process – an extra settlement for a service already procured by the LSE and something the CAISO did not have to procure.

At minimum, this scenario adds unnecessary administrative and transaction costs – increasing costs at no benefit, which depends on the revenue and cost streams being correctly allocated and accounted for by the CAISO, the market participants and the contractual parties. Establishing a capability compensation mechanism is likely to cause inefficiencies through the added,

unnecessary complexity. For the above reasons, SCE does not believe that a capability attribute should receive a CAISO payment<sup>4</sup>.

### **Compliance, testing, cost allocation**

As stated earlier, SCE does not support compensation for capability, since this attribute is already provided for in existing California contracts. Thus, there is no relevance toward rescinding a payment for that attribute.

With regards to the provision attribute, the CAISO would need to accurately determine that generators are appropriately responding to dispatch. Assuming that the compensation mechanism is designed to make resources indifferent between providing real or reactive power, a generator may choose to provide real power even after receiving a dispatch for reactive power, or vice versa. With no penalty mechanism in place, the generator can produce either type of power and be compensated for both services even if either provision is inconsistent with a CAISO dispatch. Thus, the resource is paid in full, regardless of its response to CAISO instruction. Whether the resource complies with or ignores the dispatch, it ends up in the same financial position. This is inappropriate. In this case, the generator should be penalized for such behavior. Ignoring any CAISO dispatch, for real or reactive, should disqualify compensation.

Finally, on cost allocation, SCE does not support a capability payment; hence, cost allocation for that component is not within scope of these comments. Regarding the provision component, SCE believes that ultimately this cost is to provide for reliable real power provision to load. As such, reactive power should be allocated in the same manner as real power.

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<sup>4</sup> To the extent that the CAISO has identified an existing generator that is not presently providing voltage support, meeting a demonstrated need for voltage support, SCE prefers that such a generator be individually compensated for such service, rather than a blanket payment for all generators for an attribute that is accounted for within bilateral contracts. In such a case, it would be most effective to review the individual circumstances to determine what if any incremental payments should be made and by whom to appropriately compensate the generator for the reactive power capability.