# Stakeholder Comments
# CAISO's Reactive Power Requirements for Asynchronous Resources
# Issue Paper and Straw Proposal, March 5, 2015

| Submitted by | Company | Date Submitted |
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Southern California Edison (SCE) appreciates the opportunity to comment on the California Independent System Operator (CAISO), March 5, 2015 Reactive Power Requirements for Asynchronous Resources Issue Paper and Straw Proposal (CAISO's Proposal). 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 or not such generators should be required to provide reactive power. Overall, SCE supports the CAISO's Proposal.

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;
- 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 opposes oversizing of or installing extra inverters to meet reactive power requirements; and
- SCE does not believe that enforcement of reactive power and voltage regulation capabilities can be adequately administered if they are to be included in new power purchase agreements (PPAs), but rather should reside in the CAISO Tariff and Generation Interconnection Agreements, with which PPAs require generators to comply.

**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 parasitically depend 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 a general requirement of reactive power capability being imposed 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. As the CAISO states[i], "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. 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 and results in the costs being applied to all transmission ratepayers rather than generating resources[ii]."

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.

**New Reactive Power Rules Should Be Applied 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 July 2015 CAISO Board meeting. Allowing sufficient time for tariff revisions to become effective, resources seeking to interconnect in Queue Cluster 9 in April 2016 should be the earliest cluster to possibly be 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. Generating units that are replaced or repowered should adhere to these new requirements.

**SCE Opposes Oversizing Of or Installing Extra Inverters to Meet Reactive Power Requirements**

SCE does not believe it is appropriate to oversize or install more inverters to meet reactive power requirements. 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 which have not been properly studied 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 enforcement of reactive power and voltage regulation capabilities can be adequately administered if they are to be included in new PPAs. 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, such operational requirements are already addressed in Appendix C of the current GIAs. 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 and such deficiencies need to be alleviated by the Interconnection Customer or run the risk of being permanently disconnected until such mitigation is put in place by the Interconnection Customer.

[i] CAISO Proposal, at page 14.

[ii] CAISO Proposal, at page 18.