Attachment B

Stakeholder Process: Interim Interconnection Requirements Initiative

Summary of Submitted Comments

Stakeholders submitted three rounds of written comments to the ISO on the following dates:

- Round One – March 3, 2010
- Round Two – April 8, 2010
- Round Three – April 30, 2010

Stakeholder comments are posted at: http://www.caiso.com/1c51/1c51c7946a480.html

Other stakeholder efforts include:

- Publish Initial Issues Presentation – February 16, 2010
- Stakeholder conference call – February 19, 2010
- Publish draft Straw Proposal – March 25, 2010
- Stakeholder meeting – April 1, 2010
- Publish draft Final Straw Proposal – April 20, 2010
- Stakeholder conference call – April 28, 2010
- Publish Final Straw Proposal – May 10, 2010

Management Proposal or Stakeholder Issue	Renewable Developers and Developer Associations*	SCE	Division of Ratepayer Advocates	Calpine	Management Response
ISO proposes to modify specific interconnection standards prior to conclusion of pending efforts at NERC and WECC	Oppose ISO should not risk jeopardizing uniform standards	Support	Conditional Should work closely with NERC/WECC to maximize consistency and not impose overly stringent requirements	Support Imposing requirements retroactively on approved or financed projects may have greater disruption and financial consequences.	The ISO agrees that uniform standards are important but the ISO cannot rely on ongoing national and regional processes to address immediate ISO needs. These processes do not offer any certainty that they would apply to the significant quantity of renewable capacity currently seeking to interconnect to the ISO grid. The ISO is sensitive to potential conflicts between its requirements and national or regional standards and has modified its proposal in some respects, i.e. LVRT, to minimize inconsistency.
The ISO proposes to apply the current FERC Order No. 661-A power factor requirement for wind resources to solar photovoltaic resources. However, unlike Order No. 661-A, the requirement will apply regardless of resource specific need determination through a system impact study.	Oppose ISO should be required to demonstrate need for reactive power through studies before imposing additional costs on renewable development. ISO can protect reliability through an efficient "clustering" study process. Large Scale Solar Association (LSA) – there is no reason why intermittent resources should be required to provide these services, including power factor, when others are not required to do so.	No Comment	Identify Response: Conditional	Support Non-variable generation typically provide the requirements without clear compensation for these necessary reliability obligations. Current application is discriminatory.	Power factor is a needed capability to maintain grid reliability. The ISO recognizes that the current Order No. 661-A structure does provide the ISO with authority to compel reactive power requirements. However, the ISO's position rests on several factors. First, the system currently functions reliably, in part, based on the reactive power contribution from conventional generators. The conversion to different generating technologies does not fundamentally change the need for reactive capability and modern renewable resources have this capability similar to conventional generation. As renewable resources displace the conventional generation, the sources of reactive power will also diminish. The quality of reactive power from generators, in contrast to static devices, is preferable and while the ISO will allow the developer to comply with the power factor requirement in the least costly means available, the renewable industry must continue to mature in a manner commensurate with its future role in providing power. The ISO has not required (as have some other jurisdictions) that a minimum fraction of the reactive power capability of the VER plant be provided as 'dynamic' vars, i.e. fast, continuously variable reactive resources. In this sense, the requirement is less stringent than one that would require absolute functional parity with conventional synchronous generation. It is difficult to study ahead of time potential transmission configurations and maximum VER capacity installation under all credible operating scenarios. Also, as more VERs displace conventional resources, the ability to control voltages

Management Proposal or Stakeholder Issue	Renewable Developers and Developer Associations*	SCE	Division of Ratepayer Advocates	Calpine	Management Response
					diminishes under certain operating conditions. In lieu of retroactively requesting these requirements, the ISO must, in the interest of maintaining reliability for a broad range of possible future system conditions, ensure that all resources be built to contribute to reactive power needs.
The ISO proposes to measure power factor at the point of interconnection and allow interconnecting facilities to meet the power factor through the least cost means possible by permitting the use of static devices.	Oppose Should allow projects to meet their reactive power obligations by installing reactive power control equipment wherever it is most cost effective, i.e., at the POI or elsewhere on the grid. Projects should be allowed to coordinate with other projects to share costs. Exceptions to the point of measurement should be allowed based on the length of the inter-tie to the point of interconnection.	No Comment	No Comment	Support	The ISO agrees in large part. Reactive support can be supplied with capacitors, or by the VER inverters should that capability be selected by the resource. However, given that the purpose of the reactive power requirement is to support the transmission grid, measuring the power factor requirement at POI is appropriate regardless of the distance between the generator and the point of interconnection. Nevertheless, the ISO has recognized there may be circumstances where allowing the power factor to be measured at an alternative point may be more consistent with efficient voltage regulation when multiple generators are connected at the same bus. In either case, the ISO expects the reactive power supplied to the grid to be equivalent. With respect to allowing projects to share costs, the ISO's proposal is to require power factor from each project and therefore does not preclude a sharing of costs by the project developers outside the ISO tariff.
The ISO proposes to restrict the power factor requirement to when the generating facility is producing at greater than 20% of its active power	Conditional If full reactive power output must be provided at a real power output less than full load, it could	No comment	No comment	No Comment	Based on input from its consultant, GE, the ISO modified its proposal to account for the special characteristics of generating facilities that link multiple small generators through a large and complex collector system.

Management Proposal or Stakeholder Issue	Renewable Developers and Developer Associations*	SCE	Division of Ratepayer Advocates	Calpine	Management Response
output.	require generators to install additional (compensation) at additional cost.				
The ISO proposes to extend the FERC Order No. 661-A low voltage ride-through capability to all generators.	Oppose High Voltage Ride Through: Inverters currently provide 10% over voltage. Compliance with 20% will be costly. We recommend allowing the 10% until the issue is vetted by NERC. Low Voltage Ride Through: The solar industry is currently moving in this direction. The proposed standard would also require review /re-design of the balance of system. A transition period will be necessary. The ISO did not adequately consider commercial impacts.	No comment	No comment	Support As the penetration rates of VERs increase, the ISO's ability to ignore their reliability impacts - or actively seek that they disconnect from the grid when system stress occurs - diminishes.	The ISO has withdrawn the initial recommendation to follow the pending NERC standard and therefore avoids mandating a high-voltage ride through requirement greater than 10% as suggested. Also by modifying the LVRT requirement to comport with Order No. 661-A applicable to wind, the ISO understands from OEMs that the capability currently exists. Given that most facilities subject to the new requirement will not be operational for a significant period of time, the ISO again believes that the balance of system issues can be timely resolved. The ISO has attempted to consider commercial impacts by adopting standards consistent with current OEM capability and therefore represent only incremental costs of development. The ISO has provided, as recommended by stakeholders, proof from at least OEMs that the capability is available. For this reason, the ISO has not proposed uniformly exempting projects with signed power purchase agreements. Finally, by exempting projects that have entered into LGIAs and/or purchased equipment, in some cases, the ISO is attempting to recognize that new requirements may disproportionately disadvantage such projects. The ISO has also attempted to clarify the conditions under which an equipment purchase qualifies, i.e., procurement of invertors that will manage 30% or more of the project's maximum capacity as set forth in the interconnection application.
The ISO proposes to require all variable energy generators to meet the existing WECC frequency ride-through requirements.	Support Enforcement and monitoring should also be through WECC.	No comment	No comment	No Comment	The ISO agrees that compliance of existing WECC requirements will be through that organization. In general, the ISO does not propose any new compliance requirements based on this initiative. Either compliance will be similar to existing interconnecting generation in terms of proof of capability or, in the context of generation power management, the implications of not complying, in large part, be determined by market rules developed in subsequent stakeholder processes.
The ISO proposes to require new variable energy generators have the	Oppose Discussion of capabilities	No comment	Conditional This is a critical	Support	The ISO proposal focuses on critical capability, namely, the ability whenever fuel is available to adjust output in a downward direction in response to a dispatch instruction or

Management Proposal or Stakeholder Issue	Renewable Developers and Developer Associations*	SCE	Division of Ratepayer Advocates	Calpine	Management Response
capability to curtail output in response to existing communication protocols. Resources must be capable of curtailing in increments of 5 MW and at a ramp rate of between 5-20% of rated capacity/min, with a default setting of 10%.	regarding generation power management should not be decoupled from discussion of the market and operational rules used to apply the capabilities. In this regard, variable energy generators should be allowed to offer curtailment bids and the ISO should compensate the wind generators accordingly. VER projects normally produce the maximum output achievable under any given operating conditions. As a result, VERs generally are not able to respond to dispatch instructions for increased output. A response for reduced output is possible. Such an instruction should be given only for the purpose of preserving grid reliability. Many VERs do not have the ability to ramp down in a continuous, governor controlled manner. However, some projects will have the ability to provide instantaneous output reductions in multiple controlled steps. LSA indicated that steps of the greater of 5 MW or 5% is reasonable.		technical issue that should not wait, but must reflect current capabilities and balance cost impacts.		operating order, be able to trip the plant remotely, and control the ramp rate after engagement or disengagement of a curtailment instruction. The ISO recognizes that absent storage, such resources cannot respond to instructions to increase output and therefore such capability is not part of the proposal. Moreover, the ISO has committed not to apply this capability until after conclusion of a subsequent stakeholder process to discuss market rules, including compensation for curtailment bids. The ISO has recognized that some resources will reduce output in a step-wise manner. As such, the generation management requirements have been modified to allow for less granular step reductions of 5 MW, which is consistent with a recommendation made by the development community. The ISO has attempted to accommodate commercial considerations by confirming that the capability is offered by multiple OEMs and by identifying a reasonable transition period of January 1, 2012. Finally, this obligation will not apply to resources that have existing or tendered LGIAs.

Management Proposal or Stakeholder Issue	Renewable Developers and Developer Associations*	SCE	Division of Ratepayer Advocates	Calpine	Management Response
	The capability to implement the requirements do not exist or are commercially impracticable.				
The ISO proposes to require all variable energy generators to meet the existing WECC over frequency droop response requirements.	Oppose The application of the droop requirement…to wind generators… should be based on a demonstration of need as determined in studies. There should be a provision for a 0.05 Hz deadband. The total requirement should be allocated to individual generators based on their MW size. ISO should not require an under frequency response.	No comment	No comment	Support	The application for droop control is currently a WECC requirement identified in MORC. A dead band has been included in the proposal. Use of droop control ensures the requirement that generators share in reduction based on their MW size. The droop characteristic is an automated process. In the case of VER, the response being requested is for + 0.036 Hz similar to all other resources. This requirement should not be limited temporally because all resources should be participating to reduce high frequency. AGC would kick in to help restore frequency but at any given time, there is a finite amount of regulating capacity available, which may not be adequate to lower the frequency. In other words, the over-frequency response should persist until AGC and/or other market dispatch reduce frequency below the threshold reliability level.

*Unless otherwise indicated the entities within this group include: Independent Energy Producers, CalWEA, Large Solar Association and Solar Alliance, NRG Energy, Inc., Sempra Generation, and NextEra.