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Sent: Wednesday, June 10, 2015 3:08 PM
To: Initiative Comments
Subject: Issue Paper Comments: Reactive Power Requirements

Thank you for the opportunity to provide input. These are the comments of Siemens Power Technologies International (Siemens PTI):

1. We applaud CAISO for anticipating the issue of obtaining reactive support at the high levels of renewable penetration expected over the next 15 years in California. Clearly, if renewable generation is intended to displace conventional generation, the renewable generation must be capable of providing the necessary ancillary services required to assure reliable and efficient operation of the CAISO system. The CAISO position paper describes a well-considered and workable proposition to obtain reactive capability from future renewable resources. Ultimately, renewable generation must be just as capable as existing synchronous generation to provide ancillary service support like voltage and frequency regulation. What CAISO proposes in this issue paper is a good start.

2. 11.3.2 describes an "exceptional dispatch category" for resources that can transition quickly from active power production to reactive power production. We should note that many renewable resources have the ability to operate in "synchronous condenser" or "STATCOM" mode when they are not capable of producing active power (because of the absence of solar power or sufficient wind), absorbing a small amount of real power from the power system while creating or absorbing reactive power. As such, they can be an excellent reactive source when not producing active power (e.g., at night for solar resources and during low wind periods for wind resources). In many cases, considerably more reactive power is available in this mode than during full power production. Incentives should be provided to encourage operation in this mode where appropriate. If a region contains both wind and solar resources, it seems possible that sharing of reactive responsibility may optimize system performance, particularly since peak solar production and peak wind production seldom coincide.

3. Reactive capability testing, as described in 11.4, is customarily performed assuming the attributes of synchronous machines, which typically have a narrower continuous voltage range than renewable resources and can support a wider range of system voltages than synchronous machines. Synchronous machines have a standard voltage range of 95% to 105% of nominal at their terminals, while inverter-based renewables have a standard voltage range of 90% to 110% of nominal. Testing requirements should be revised to reflect the wider operating voltage range of renewable resources. Transmission voltage limits should also be reviewed in consideration of the wider range of voltages afforded by inverter-based equipment.