

132 FERC ¶ 61,196  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Jon Wellinghoff, Chairman;  
Marc Spitzer, Philip D. Moeller,  
John R. Norris, and Cheryl A. LaFleur.

California Independent System  
Operator Corporation

Docket No. ER10-1706-000

ORDER ON TARIFF REVISIONS

(Issued August 31, 2010)

1. On July 2, 2010, the California Independent System Operator Corporation (CAISO) filed revisions to its tariff relating to interconnection requirements applicable to large asynchronous generators,<sup>1</sup> predominantly wind and solar photovoltaic resources. The CAISO's proposed tariff revisions would impose requirements in four specific areas: (1) power factor design and operations criteria; (2) voltage regulation and reactive power control requirements; (3) frequency and low voltage ride-through requirements; and (4) generator power management. The CAISO requests waiver of the Commission's regulations to permit the tariff revisions to become effective as of July 3, 2010, except for the proposed tariff revisions regarding generator power management, for which the CAISO requests waiver of the Commission's regulations to permit an effective date of January 1, 2012. This order accepts in part and rejects in part the CAISO's proposed tariff revisions.

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<sup>1</sup> Asynchronous generators, also known as non-synchronous generators, are a type of generator that produces alternating electric current that matches the frequency of an interconnected power system but the mechanical rotor of the generator does not rotate in synchronism with the system frequency. A non-synchronous generator possesses characteristics significantly different than traditional generators and thus responds differently to network disturbances. Large generators have a capacity of more than 20 megawatts.

## I. Background

2. The CAISO's proposed tariff revisions in this docket are intended to address operational considerations arising from policies that encourage development of renewable resources. The CAISO states that pursuant to California's current renewables portfolio standard (RPS), electric corporations in California are required to increase procurement from renewable energy sources by at least 1 percent of their retail sales annually, until they reach 20 percent by the end of 2010.<sup>2</sup> The CAISO further points out that the Governor of California has issued executive orders setting a target for renewable energy resources to supply 33 percent of the power to California by 2020.<sup>3</sup>

3. According to the CAISO, the targets for renewable energy resources have already led to a dramatic increase in requests to interconnect variable energy resources to the CAISO controlled grid.<sup>4</sup> The CAISO states that its transition cluster<sup>5</sup> contains over 8,200 MW of renewable capacity, out of a total of approximately 10,400 MW of capacity in the cluster.<sup>6</sup>

4. As a result of the anticipated increase in variable energy resources due to California legislation and executive orders, the CAISO anticipates eventual displacement

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<sup>2</sup> CAISO Transmittal Letter at 2 (citing California Public Utilities Commission (CPUC) report entitled *Renewables Portfolio Standard Quarterly Report – Q4 2009*, at 1, 4 (CPUC Report)). This report is available on the CPUC's website at <http://www.cpuc.ca.gov/NR/rdonlyres/52BFA25E-0D2E-48C0-950C-9C82BFEEF54C/0/FourthQuarter2009RPSLegislativeReportFINAL.pdf>.

<sup>3</sup> *Id.* (citing CPUC Report at 1, *referring to* Executive Orders S-14-08 and S-21-09 of Governor Schwarzenegger). A 33 percent target is also a critical component of the California Air Resource Board's plan to implement the greenhouse gas emission reduction requirements embodied in California Assembly Bill 32 as well as the subject of pending legislation in California (California Senate Bill 722).

<sup>4</sup> Throughout the filing, the CAISO uses the terms asynchronous generation and variable or renewable energy resources interchangeably. However, the proposed tariff changes apply to asynchronous variable energy resources, generally solar photovoltaic and wind generators.

<sup>5</sup> The transition cluster is the first group of projects to be studied under the CAISO's reformed large generator interconnection procedures. *See Cal. Indep. Sys. Operator Corp.*, 124 FERC ¶ 61,292 (2008).

<sup>6</sup> CAISO Transmittal Letter at 2.

of conventional generation resources with variable energy resources.<sup>7</sup> According to the CAISO, the displacement of conventional resources by variable energy resources will result in the displacement of certain technical characteristics that are either inherent in, or historically required from conventional resources. Specifically, the CAISO states that the extent to which the grid can successfully integrate variable energy resources will be significantly influenced by the ability and extent to which those variable energy resources contribute basic technical characteristics, such as reactive power capabilities and voltage regulation, which the CAISO states are critical to support a reliable transmission system.<sup>8</sup>

5. Based on these considerations, the CAISO states that it submitted the proposed tariff revisions in this docket to require variable energy resources to possess certain technical characteristics that the CAISO states are comparable to the technical characteristics required for conventional generators.

6. The CAISO states that the proposed tariff revisions include changes to section 8.2.3.3 in the main body of the CAISO's tariff. However, the CAISO states that the majority of the tariff revisions are contained in two new large generator interconnection agreements (LGIA), and in the LGIAs' Appendix H of standard procedures and technical requirements for each of the two versions of the CAISO's large generator interconnection process.<sup>9</sup> The CAISO explains that in the existing LGIAs, Appendix H applies only to wind generators, but in the new LGIAs Appendix H will apply to all asynchronous generators.

7. The CAISO proposes that interconnection customers with asynchronous generating projects that have interconnection requests in the serial queue or in a queue cluster and that are tendered for execution an LGIA after the effective date of the CAISO's proposed tariff revisions will be required to enter into one of the new LGIAs

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<sup>7</sup> In addition to the renewables procurement requirements, the CAISO also references the possible reduction in availability of conventional generation resources as a result of water usage policies adopted by the California State Water Resources Control Board, (citing California State Water Resources Control Board, *Resolution 2010-0062*, available at [http://www.swrcb.ca.gov/board\\_decisions/adopted\\_orders/resolutions/2010/rs2010\\_0020.pdf](http://www.swrcb.ca.gov/board_decisions/adopted_orders/resolutions/2010/rs2010_0020.pdf)).

<sup>8</sup> CAISO Transmittal Letter at 3.

<sup>9</sup> The CAISO explains that there are two versions of its large generator interconnection process. The CAISO provides that one version applies to interconnection requests being studied serially, while the other version applies to interconnection requests being studied in queue clusters.

that result from the tariff revisions. The CAISO proposes to exempt from the proposed tariff revisions interconnection customers that have executed or been tendered for execution an LGIA before the effective date of the CAISO's proposed tariff revisions. The CAISO also proposes to exempt existing generating units that are, or have been connected to the CAISO controlled grid at the same location as of the effective date of the proposed tariff revisions, for the remaining life of the existing equipment. According to the CAISO, replacement units would be required to satisfy the new tariff provisions.

## **II. Notice and Responsive Pleadings**

8. Notice of the CAISO's filing was published in the *Federal Register*, 75 Fed. Reg. 40,809 (2010), with interventions or protests due on or before July 23, 2010. San Diego Gas & Electric Company, Pacific Gas & Electric Company, the Cities of Anaheim, Azusa, Banning, Colton, Pasadena and Riverside, California, and Modesto Irrigation District filed motions to intervene. The California Department of Water Resources State Water Project (State Water Project), Bonneville Power Administration (Bonneville), Calpine Corporation (Calpine), First Solar, Inc. (First Solar), California Wind Energy Association and American Wind Energy Association (CalWEA/AWEA), and the Large-Scale Solar Association (Large-Scale Solar) filed motions to intervene and comments. Sempra Generation (Sempra) and Lompoc Wind Project LLC (Lompoc Wind) filed motions to intervene and protests.

9. The CAISO filed an answer to motions to intervene and comments, and motion to file answer and answer to protests.

## **III. Procedural Matters**

10. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2010), the timely, unopposed motions to intervene serve to make the parties that filed them parties to this proceeding.

11. Rule 213(a)(2) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 213(a)(2) (2010), prohibits an answer to a protest unless otherwise ordered by the decisional authority. We are not persuaded to accept the CAISO's answer and will, therefore, reject it.

## **IV. General Issues**

### **A. CAISO Filing**

12. The CAISO requests waiver of the Commission's notice and comment regulations to permit the tariff revisions to become effective as of July 3, 2010, except for the tariff

revisions regarding generator power management, for which the CAISO requests an effective date of January 1, 2012.<sup>10</sup>

**B. Comments and Protests**

13. Calpine, State Water Project, and Bonneville filed comments that generally support the CAISO's proposed tariff revisions. Bonneville specifically supports the CAISO's proposed generator power management and active power management revisions, including the CAISO's proposed tariff revisions as they relate to ramp rate limits, frequency response and automatic controls and enabling by the CAISO. Bonneville also clarifies how its reactive power and voltage control requirements compare with the reactive power and voltage control requirements proposed by the CAISO.

14. Large-Scale Solar states that the Commission should reject the CAISO's proposed tariff revisions in their entirety. Large-Scale Solar provides the following seven reasons why the CAISO's proposed tariff revisions should be rejected: (1) the time allowed for consideration of the revised standards was inadequate; (2) the revised standards proposals are premature and not adequately justified; (3) the revised standards proposals lack critical details needed to determine their reasonableness; (4) the CAISO's filing does not demonstrate that the revised standards are the most efficient and cost-effective means to provide the services the CAISO needs; (5) the CAISO has not justified its proposal to impose the revised standards only on asynchronous generators; (6) the retroactive imposition of the revised standards on generators with already-executed purchase power agreements or otherwise in advanced development would be unfair; and (7) the revised standards rely, in part, on equipment that is either not available today or not available on a competitive basis.<sup>11</sup>

15. If the Commission does not reject the CAISO's filing, Large-Scale Solar argues that the Commission should order general changes to the revised standards. The general changes proposed by Large-Scale Solar are as follows: (1) the Commission should condition approval of the CAISO's proposed tariff revisions in such a manner that the accepted tariff revisions will be required to comport with any standards addressing the same areas as adopted by the North American Electric Reliability Corporation (NERC) or the Western Electricity Coordinating Council (WECC); (2) the Commission should require that the new requirements be imposed on all generation resources that are technologically capable of meeting them, rather than just on variable energy resources; (3) the Commission should require the CAISO to use available market mechanisms

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<sup>10</sup> CAISO Transmittal Letter at 1.

<sup>11</sup> Large-Scale Solar Protest at 3-7.

before exercising or dispatching the new capabilities; (4) the Commission should require the CAISO to file, within a year, additional evidence that the revised standards are the optimal means of providing the services needed to manage future generation-mix changes; (5) the Commission should exempt projects already in the interconnection queue from the revised standards when compliance would delay the project, necessary equipment is not available, the developer has already executed a purchase power agreement for the facility, or the generating plant is in the serial group; (6) the Commission should exempt projects from the revised standards if the project developer has been tendered an unexecuted LGIA for comment; and (7) any approved exemptions from the revised standards should be included as regular options in the new *pro forma* LGIA.<sup>12</sup>

16. First Solar states that the CAISO's proposal to make its tariff revisions applicable to projects which have neither executed nor been tendered for execution an LGIA by July 3, 2010 could delay the financing and construction start of some projects. First Solar points out that such a delay could jeopardize the projects' eligibility to obtain benefits associated with the American Recovery and Reinvestment Act of 2009. First Solar asks the Commission to direct that the CAISO process LGIAs in accordance with its currently effective tariff and, if necessary, to seek changes to them after they are on file with the Commission to conform to any new *pro forma* LGIA approved in this proceeding.<sup>13</sup>

17. Lompoc Wind argues that it should not be required to enter into the new LGIA because it is already a party to an existing generation interconnection agreement that is in the process of amendment.<sup>14</sup>

18. CalWEA/AWEA argue that the process undertaken by the CAISO in proposing its tariff revisions does not reflect a thorough vetting of issues and concerns as normally occurs before a major tariff change. According to CalWEA/AWEA, concerns with the CAISO's process and the need for a further stakeholder process are sufficiently problematic that the Commission should deny the CAISO's request to waive the prior notice filing requirement.<sup>15</sup>

19. Sempra argues that the proposed timing of applicability of the proposed tariff revisions is flawed, because it is dependent on the tender of an LGIA to an

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<sup>12</sup> *Id.* at 7-9.

<sup>13</sup> First Solar Protest at 3-5.

<sup>14</sup> Lompoc Wind Protest at 4-6.

<sup>15</sup> CalWEA/AWEA Protest at 10-11.

interconnection customer by the CAISO, an event that Sempra states is solely within the CAISO's control. Sempra states that a better approach would have been to exempt from the new requirements any customer that should have been tendered an LGIA as of the effective date of the tariff revisions, pursuant to the CAISO's current large generator interconnection procedures.<sup>16</sup> Large-Scale Solar also asks that a project receive an exemption from the proposed requirements if the CAISO has tendered a draft LGIA to the interconnection customer for comment.<sup>17</sup>

### C. Commission Determination

20. The Commission has determined that good cause has been shown to grant waiver of the Commission's notice requirements pursuant to section 35.11 of the Commission's regulations.<sup>18</sup> Thus, the tariff revisions accepted by the Commission are effective upon July 3, 2010, as requested by the CAISO.

21. The Commission disagrees with Large-Scale Solar's suggestion that we should reject the CAISO's proposed tariff revisions in their entirety. To the extent that we find the CAISO's tariff revisions premature or in need of additional vetting through the stakeholder process, those tariff revisions are not accepted in this order.

22. We find that the proposed general changes offered by Large-Scale Solar are either incorporated in our treatment of the CAISO's proposed tariff revisions or unnecessary in ascertaining whether the low voltage ride-through and frequency ride-through tariff revisions are just and reasonable.

23. We decline to direct the CAISO to pursue the course of action requested by First Solar in tendering LGIAs to interconnection customers with pending interconnection requests. The CAISO's tariff prescribes the terms and conditions under which the CAISO enters into LGIAs. The CAISO must follow its tariff on file with the Commission until revisions are accepted by the Commission. We see no reason to direct that the CAISO deviate from following its filed tariff.

24. We find that Lompoc Wind has an executed generator interconnection agreement with Pacific Gas and Electric Company that was approved by the Commission in 2008.<sup>19</sup>

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<sup>16</sup> Sempra Protest at 3-5.

<sup>17</sup> Large-Scale Solar Protest at 9.

<sup>18</sup> 18 C.F.R. § 35.11 (2010).

<sup>19</sup> See Pacific Gas and Electric Company, Docket No. ER09-49-000 (November 19, 2008).

Therefore, Lompoc is exempt from the provisions of the CAISO's proposed tariff revisions, consistent with the CAISO's proposal as reflected in the transmittal letter in this proceeding.<sup>20</sup> We also agree with Sempra and Large-Scale Solar that exemption from the CAISO's tariff revisions should apply to any interconnection customer that has been or should have been tendered an LGIA prior to July 3, 2010, pursuant to the CAISO's large generator interconnection procedures.<sup>21</sup>

25. We also find, as further discussed below, that it is appropriate to accept the CAISO's proposed tariff revisions regarding low voltage ride-through and frequency ride-through with an effective date of July 3, 2010, as requested. We need not decide whether to further waive the prior notice filing requirements for those portions of the CAISO's proposed tariff revisions that we do not accept.

## V. Proposed Tariff Revisions

### A. Revisions to Power Factor Design and Operations Criteria

#### 1. CAISO Filing

26. The CAISO states that article 9.6.1 of existing LGIAs requires each interconnection customer to design its large generating facility to provide reactive power by maintaining delivery of electricity within certain power factor ranges, unless different power factor ranges are otherwise specified by the CAISO. Interconnection customers must generally maintain a composite power delivery at continuous rated power output at the terminals of the electric generating unit at a power factor within the range of 0.95 leading to 0.90 lagging.<sup>22</sup> Power factor design for wind generators is addressed in Appendix H to current LGIAs, requiring wind generators to operate within a power factor range of 0.95 leading to 0.95 lagging if the interconnection system impact study shows

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<sup>20</sup> See CAISO Transmittal Letter at 6-7.

<sup>21</sup> The large generator interconnection procedures provide, in relevant part, that within thirty days after the CAISO receives the interconnection customer's written comments, or notification of no comments, to the draft interconnection facilities study (or final Phase II study) report, the applicable participating transmission owner(s) and the CAISO shall tender a draft LGIA, together with draft appendices. See CAISO Tariff, Appendix Y, section 11.1.

We take administrative notice that the CAISO has reached a similar conclusion and as a result posted interconnection customers who are exempt from the proposed tariff revisions on its website *available at* <http://www.caiso.com/27da/27dac193e630.html>.

<sup>22</sup> See CAISO Transmittal Letter at 8.



that such a requirement is necessary to ensure safety or reliability, consistent with the requirements of Order No. 661 and confirmed in Order No. 661-A.<sup>23</sup>

27. According to the CAISO, reactive power is necessary to energize and transmit power in an alternating current transmission system and is fundamental to maintaining voltage stability on the system. The CAISO proposes to revise its tariff provisions regarding power factor design to require all large asynchronous generators to provide reactive power, based on the CAISO's anticipation that asynchronous variable energy resources will be displacing conventional generators over time.<sup>24</sup>

28. The CAISO's proposed tariff revisions would require all large asynchronous generators to be designed with the following characteristics:

- The asynchronous generators must have net reactive power sourcing and absorption capability to achieve or exceed a net reactive power range of approximately 0.95 leading and 0.95 lagging, measured at the point of interconnection.
- The asynchronous generator may meet the power factor range requirement by using power electronics or fixed and switched capacitors, or a combination of both.
- The asynchronous generator must also provide dynamic voltage support if the interconnection system impact study requires dynamic voltage support for system safety or reliability.
- The asynchronous generator must vary its reactive power output between the full sourcing and full absorption capabilities such that any change in the reactive power output does not cause a change in voltage at the point of interconnection greater than 0.02 per unit of the nominal voltage.<sup>25</sup>

29. In addition, the CAISO tariff revisions would specify a series of provisions identifying operating requirements to be utilized in connection with the required power factor design in providing reactive power and maintaining voltage support.

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<sup>23</sup> *Interconnection for Wind Energy*, Order No. 661, FERC Stats. & Regs. ¶ 31,186, *order on reh'g*, Order No. 661-A, FERC Stats. & Regs. ¶ 31,198 (2005); *see also Nevada Power Co.*, 130 FERC ¶ 61,147 (2010).

<sup>24</sup> CAISO Transmittal Letter at 8.

<sup>25</sup> *Id.* at 9-10.

30. Except for the provision regarding dynamic voltage support, the CAISO proposes to make these power factor design provisions applicable to all asynchronous generating facilities that have interconnection requests in a serial queue or queue cluster and that enter into one of the new LGIAs, i.e., all LGIAs tendered for execution after the effective date of the tariff revisions, without the requirement of showing a specific need for reactive power in a system impact study. The CAISO states that the requirement does not affect any existing, operational asynchronous generator interconnection customer or any asynchronous generator interconnection customer that has executed, or been tendered for execution, an LGIA as of the effective date of the tariff revisions.<sup>26</sup>

31. The CAISO states that it recognizes that the proposed tariff revisions depart from the requirements in Order No. 661-A, as described above. Nevertheless, the CAISO argues that the proposed tariff revisions are just and reasonable. The CAISO notes that Order No. 661-A was issued in 2005, before the imposition of the 20 percent and 33 percent RPS targets for California. The CAISO further argues that recent studies support requiring wind and other asynchronous generation to maintain reactive power capabilities.<sup>27</sup>

32. The CAISO further argues that Order No. 661-A found that requiring wind generators to install reactive power capability in the absence of a system impact study demonstrating a need to ensure system reliability could raise discrimination issues, because such capability was a significant added cost for wind generators, but not for conventional generators.<sup>28</sup> The CAISO argues that its proposed tariff revisions do not raise discrimination issues because installing reactive power capability necessarily adds to the cost of a conventional generator,<sup>29</sup> and that the cost of installing reactive power capability to an asynchronous generator will be moderated because the CAISO proposes to allow each asynchronous generator to decide what equipment it will install. The CAISO further states that various equipment manufacturers have written to the CAISO to explain that they offer, or will soon offer, the equipment that is necessary to enable for wind, solar and other asynchronous generators to provide reactive power capability. The

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<sup>26</sup> *Id.* at 10-11.

<sup>27</sup> *Id.* at 11 (citing a 2007 study performed for the CAISO and a more recent study performed in the Devers area in the Southern California Edison service territory).

<sup>28</sup> *Id.* (citing Order No. 661-A, FERC Stats. & Regs. ¶ 31,198 at P 41, 45).

<sup>29</sup> *Id.*

CAISO states that it does not expect that the cost of installing reactive power capability will significantly add to the cost of an asynchronous generator.<sup>30</sup>

33. The CAISO argues that its proposed tariff revisions are fair because they place all large generators, both synchronous and asynchronous in a similar position with respect to reactive power support, voltage control and system reliability. The CAISO states that the system impact studies are not the appropriate vehicle for making long-term planning determinations. The CAISO states that system impact studies are appropriately focused on near-term transmission upgrades necessary to safely and reliably interconnect customers to the CAISO's grid.<sup>31</sup>

34. The CAISO states that its proposed tariff revisions make clarifying changes to section 8.2.3.3 (Voltage Support) in the main body of the CAISO's tariff. The CAISO states that at present there is a discrepancy between section 8.2.3.3 and article 9.6.1 of the existing LGIAs regarding the measurement point for the power factor. According to the CAISO, section 8.2.3.3 states that the measurement point for all generators is the point of interconnection with the CAISO controlled grid, but article 9.6.1 states that the measurement point for all generators other than wind is the generator terminal. The CAISO proposes to eliminate the discrepancy by deleting the sentence in section 8.2.3.3 referencing the measurement point for all generators and revising the balance of that section. The revised section 8.2.3.3 will state that all asynchronous generators must maintain the CAISO-specified voltage schedule at the point of interconnection, subject to certain exceptions, and that all other generators must maintain the CAISO-specified voltage schedule at the generating unit terminal.

## **2. Comments and Protests**

35. CalWEA/AWEA state that requiring variable energy resources to maintain a power factor at the point of interconnection is unreasonable, and suggest that the power factor be maintained at the high side of the generator step-up transformer instead.<sup>32</sup>

36. Lompoc Wind states that the CAISO's tariff revisions relating to reactive power are driven by external factors, such as the RPS goals. Accordingly, Lompoc Wind argues that the costs associated with implementing those changes should be rolled in and shared with all CAISO transmission customers.<sup>33</sup>

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<sup>30</sup> *Id.* at 12.

<sup>31</sup> *Id.* at 13.

<sup>32</sup> CalWEA/AWEA Protest at 10.

<sup>33</sup> Lompoc Wind Protest at 7.

37. Lompoc Wind states that requiring a wind generator to provide reactive power support should be permissible only if a needs test shows that it is necessary, consistent with Order 661-A.<sup>34</sup>

38. Lompoc Wind requests that the CAISO test the feasibility of voltage schedules in the pre-project phase to ensure that generators are responsible only for the incremental effects of their projects on reactive power requirements. Otherwise, Lompoc Wind fears that transmission owners will require generators to provide solutions for long-standing voltage problems.<sup>35</sup>

39. Lompoc Wind and Sempra also state that the CAISO should be required to evaluate the best location for voltage support equipment. Because asynchronous generators are often located far from load, siting reactive compensation at generating facilities can be inefficient and overly expensive.<sup>36</sup>

40. Lompoc Wind also states that requiring variances in output not to cause voltage deviations greater than 0.02 per unit is contradictory to WECC Table W-1, which excludes a limit for normal operating conditions and specifies a limit of 0.05 per unit for Category B contingencies.<sup>37</sup>

41. Lompoc Wind further requests that the CAISO be required to compensate generators who are curtailed in order to provide additional reactive power with “make whole” payments.<sup>38</sup> Lompoc Wind also states that requiring generators below 20 percent output to maintain a power factor within  $\pm 6.6$  percent of nameplate output should not be applicable if the generator is off-line.<sup>39</sup>

42. Lompoc Wind states that if voltage deviates from schedule by more than 0.05 per unit, it must be attributable to the generator before it is required to provide reactive

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<sup>34</sup> *Id.* at 8-9.

<sup>35</sup> *Id.* at 9.

<sup>36</sup> *Id.* at 9-10; Sempra Protest at 7.

<sup>37</sup> Lompoc Wind Protest at 10-11. A Category B contingency is any event resulting in the loss of a single element. *See* NERC Standard TPL-002-0a, Table 1.

<sup>38</sup> Lompoc Wind Protest at 11.

<sup>39</sup> *Id.*

absorption in excess of 0.95 leading. Lompoc Wind further requests clarification that absorption in excess of 0.95 leading or equipment ratings is not necessary.<sup>40</sup>

43. In addition, Lompoc Wind requests that the Commission require the CAISO to return to its stakeholder process and ensure that base planning requirements can be met before arbitrarily assigning requirements to asynchronous generators.<sup>41</sup>

44. Sempra states that imposing a blanket reactive power requirement on asynchronous generators fails to consider the potential for higher costs as a result of higher losses at photovoltaic facilities.<sup>42</sup> Sempra also states that because leading power factors are normally only required at night, it is unreasonable to require photovoltaic facilities to provide this capability, as these generators cannot operate during this period.<sup>43</sup>

### **3. Commission Determination**

45. The Commission evaluates the CAISO's proposed tariff revisions under the independent entity variation standard.<sup>44</sup> The Commission rejects, without prejudice, the CAISO's proposed tariff revisions regarding power factor design and operations criteria as unsupported. As applied to wind generators, the CAISO acknowledges that Order Nos. 661/661-A contemplated the transmission provider to support requests for these types of service after performing a system impact study. In Order No. 661-A, the Commission declined to adopt power factor standards for wind plants without a showing by transmission providers, through the generator interconnection process system impact studies, that they are needed for safety or reliability.

46. The Commission appreciates that the CAISO has developed its proposal in an effort to address the operational implications, including reliability issues, of integrating large amounts of asynchronous generation in the future. In Order No. 661-A, however,

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<sup>40</sup> *Id.* at 12.

<sup>41</sup> *Id.* at 14.

<sup>42</sup> Sempra Protest at 6-7.

<sup>43</sup> *Id.* at 7-8.

<sup>44</sup> Under the independent entity variation standard, an RTO must demonstrate that its proposed variation from Order No. 661 is just and reasonable and not unduly discriminatory and would accomplish the goals of Order No. 661. *See* Order No. 2003, FERC Stats. & Regs. ¶ 31,146 at P 822-827; Order No. 2003-A, FERC Stats. & Regs. ¶ 31,261 at P 759; Order No. 661, FERC Stats. & Regs. ¶ 31,186 at P 107-109.

the Commission established a process by which transmission providers could consider such issues in the interconnection process. The testimony and supporting documents the CAISO has provided generally describe the capabilities of, and the state of technology for, wind generators. However, the supporting documents do not explain adequately why system impact studies are not the proper venue for identifying power factor requirements for wind generators and why the CAISO must implement a broad requirement, without confirmation of system need as verified from the appropriate system studies, applicable to all asynchronous generators.<sup>45</sup>

47. In addition, as to non-wind asynchronous resources, to which Order Nos. 661/661-A do not apply,<sup>46</sup> we find that, based on the record developed in this docket, CAISO has not supported the proposal as just and reasonable.

48. Therefore, based on the record developed in this docket, the CAISO is directed to make a compliance filing within 30 days of the date of this order deleting proposed section A.iii of Appendix H, the tariff revisions regarding power factor design and operations criteria. The CAISO's proposed tariff revisions are rejected without prejudice

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<sup>45</sup> The CAISO supplied a study performed for ISO-NE that suggests that, as the penetration level of variable energy resources increases and the traditional portfolio mix of generation resources changes, there may be an increased need for reactive support from large asynchronous generators. CAISO Transmittal Letter at 3 and n.5; CAISO Transmittal Letter at Attachment D, Appendix B, section 3.3. The CAISO includes with its filing a report prepared for ISO New England Inc. (ISO-NE), that concludes that “there is no established mechanism by which host systems can prove [the need for wind generation to deliver reactive power]...”). However, that study provided only general recommendations and did not consider the unique topology of ISO-NE, much less the CAISO. The CAISO did provide a study it conducted, which did consider the CAISO's unique topology. *See* CAISO Transmittal Letter at 11. However, that study shows that system performance can be preserved if the fleet of new wind generation includes a mix of turbine technology, even if that mix includes a significant percentage of turbines incapable of providing reactive power. *See* <http://www.caiso.com/1ca5/1ca5a7a026270.pdf>, at 38. (Cited in CAISO Transmittal Letter at n.18).

<sup>46</sup> Order No. 661, FERC Stats. & Regs. ¶ 31,186 at P 12 (“The Final Rule Appendix G we adopt here applies only to the interconnection of wind plants.”).

to the CAISO justifying a deviation from the Order No. 661-A for wind resources, and for non-wind resources showing the proposal to be just and reasonable in a future filing.<sup>47</sup>

**B. Revisions to Voltage Regulation and Reactive Power Control Requirements**

**1. CAISO Filing**

49. According to the CAISO, current LGIAs specify that only synchronous generators maintain a voltage schedule by operating to produce or absorb reactive power. The CAISO states that, over time, the displacement of conventional, synchronous generation by asynchronous variable energy resources may leave the CAISO controlled grid with an inadequate source of reactive power, which could also reduce the voltage regulation capability on the CAISO controlled grid to unacceptable levels.<sup>48</sup>

50. In order to ensure that voltage regulation capability is maintained, the CAISO proposes to revise article 9.6.2 of the CAISO tariff and Appendix H of the new LGIAs anticipated under this docket. The CAISO proposes that new article 9.6.2.2 of its tariff will specify that, for asynchronous generating facilities, Appendix H will set forth the requirements for the large generating facility to respond to the loss of voltage control capability. The CAISO proposes to adopt the following provisions in Appendix H:

- The asynchronous generation facility's reactive power capability will be controlled by an automatic system having both a voltage regulation and a net power factor regulation operating mode, and the default mode will be voltage regulation.
- The voltage regulation function will automatically control the net reactive power of the asynchronous generating facility to regulate the point of interconnection positive sequence component of voltage to within a tolerance of  $\pm 0.02$  per unit of the nominal voltage assigned by the participating transmission owner or the CAISO, within the constraints of the reactive power capacity of the asynchronous generating facility, and deviations outside of this voltage band, except as caused by insufficient reactive capacity to maintain the voltage tolerances, will not exceed five minutes per incident.

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<sup>47</sup> We note, however, that the CAISO may propose, on a case-by-case basis and as supported by system impact studies, voltage regulation and reactive power control requirements for specific asynchronous generators.

<sup>48</sup> CAISO Transmittal Letter at 15-16.

- The power factor mode will regulate the net power factor measured at the point of interconnection, and if the asynchronous generating facility uses discrete reactive banks to provide reactive capability, the tolerances of the power factor regulation will be consistent with the reactive banks' sizes meeting the voltage regulation tolerances specified above.
- The net reactive power flow into or out of the asynchronous generating facility, in any mode of operation, will not cause the positive sequence component of voltage at the point of interconnection to exceed 1.05 per unit, or fall below 0.95 per unit.
- The CAISO, in coordination with the participating transmission owner, may permit the interconnection customer to regulate the voltage at a point on the asynchronous generating facility's side of the point of interconnection, but regulating voltage at a point on the asynchronous generating facility's side of the point of interconnection does not change the net power factor requirements.
- The interconnection customer will not disable voltage regulation controls without the specific permission of the CAISO, while the asynchronous generating facility is in operation at a power level greater than 20 percent of maximum capacity.<sup>49</sup>

## 2. Comments and Protests

51. Lompoc Wind states that the provision regarding voltage regulation mode should also reference the requirement to remain within a 0.95/0.95 power factor range, as well as applicable equipment ratings.<sup>50</sup>

52. Lompoc Wind further requests that a needs test be required for the voltage schedule to prevent the transmission owner from arbitrarily assigning a schedule that is too high or too low. Alternatively, Lompoc Wind requests that the transmission owner be responsible for correcting the voltage at the point of interconnection to the post-project schedule prior to project addition so the customer is responsible only for the incremental effects of its project.<sup>51</sup>

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<sup>49</sup> *Id.* at 16-17.

<sup>50</sup> Lompoc Wind Protest at 15.

<sup>51</sup> *Id.*



53. Finally, Lompoc Wind states that the interconnection customer should be able to determine the point at which the voltage is regulated, rather than through mutual agreement.<sup>52</sup>

### 3. Commission Determination

54. As discussed above, the Commission evaluates the CAISO's proposed tariff revisions under the independent entity variation standard. The Commission rejects, without prejudice, the CAISO's proposed tariff revisions regarding voltage regulation and reactive power control as unsupported. As applied to wind generators, Order No. 661-A declined to require the provision of these types of services without a showing by transmission providers, through the generator interconnection process system impact studies, that they are needed for safety or reliability.<sup>53</sup> In addition, as to non-wind asynchronous resources, to which Order Nos. 661/661-A do not apply, we find that, based on the record developed in this docket, the CAISO has not supported the proposal as just and reasonable.

55. Based on the record developed in this docket, the Commission will reject, without prejudice, the CAISO's proposed tariff revisions regarding voltage control and reactive power control requirements. The CAISO is directed to make a compliance filing within 30 days of the date of this order deleting the tariff revisions relating to voltage control and reactive power control requirements.<sup>54</sup>

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<sup>52</sup> *Id.* at 16.

<sup>53</sup> Wind plants shall also be able to provide sufficient dynamic voltage support in lieu of the power system stabilizer and automatic voltage regulation at the generator excitation system if the System Impact Study shows this to be required for system safety or reliability. Order No. 661-A, FERC Stats. & Regs. ¶ 31,198 at Appendix G.

<sup>54</sup> We note that the CAISO has proposed to create two new LGIAs, Appendices BB and CC under the MRTU Tariff, for interconnection customers who have entered into or been tendered one of the existing versions of the LGIA, prior to the effective date of this tariff amendment. Appendix BB is for interconnection requests studied serially and Appendix CC is for interconnection requests studied as part of a queue cluster. Therefore, in following the Commission directive to delete tariff revisions relating to voltage control and reactive power control requirements the CAISO would delete section Aiii from Appendix H (asynchronous generators procedures) of Appendix BB and replace it with section Aii from Appendix H of Appendices V and Z (the standard LGIA and the LGIA for queue cluster requests respectively).

## C. Revisions to Frequency and Low Voltage Ride-Through Requirements

### 1. CAISO Filing

56. The CAISO states that its existing LGIAs contain frequency ride-through provisions requiring an interconnection customer to implement under-frequency and over-frequency protection set points for a large generating facility as required by the applicable reliability council, i.e., WECC.<sup>55</sup> The CAISO further states that Appendix H of its existing LGIAs requires wind generators to have low voltage ride-through capability, consistent with the Commission's directives in Order No. 661-A.<sup>56</sup>

57. The CAISO states that in this filing it proposes to clarify and enhance the existing ride-through requirements for asynchronous generators as they displace conventional generators on the CAISO-controlled transmission system. According to the CAISO, the specific issue that it seeks to address is an issue of sympathetic tripping, in which wind and solar generators trip off-line in response to a grid disturbance that causes a deviation in voltage or frequency. The CAISO states that if asynchronous generators are not designed with ride-through capability to withstand the temporary low voltage conditions during the inception and clearing periods, those asynchronous generators will trip and stay off-line, even when the fault is cleared.

58. The CAISO is concerned that, as asynchronous generators replace conventional generators on the CAISO transmission system, the phenomenon of sympathetic tripping by wind and solar generators could result in a more severe system imbalance. According to the CAISO, this could potentially increase the magnitude of the single largest contingency on the CAISO's transmission system and have negative reliability and financial implications.<sup>57</sup>

59. The CAISO further states that the frequency on the power system is related to the amount of load and generation on the system. When the load and generation are precisely balanced, the frequency will be 60Hz. In the event that generation is lost

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<sup>55</sup> The CAISO defines frequency ride-through as the ability of a generating facility to stay connected to and synchronized with the CAISO-controlled grid during system disturbances within a range of under-frequency and over-frequency conditions.

<sup>56</sup> CAISO Transmittal Letter at 18 (citing Order No. 661-A, FERC Stats. & Regs. ¶ 31,198 at P 31-35). Low voltage ride-through is the ability of a generator to stay connected to the grid when there is a voltage dip due to a short circuit or other disturbance on the transmission system.

<sup>57</sup> *Id.* at 19.

through an unplanned or forced outage, the frequency will deviate below 60Hz. According to the CAISO, during the time necessary for the capacity that is on automatic generation control to make adjustments to bring the frequency back to 60 Hz, it is important for generators to remain on-line. The CAISO emphasizes that it is not requesting that asynchronous generators have a governor-type frequency response, but rather that asynchronous generators simply continue to generate with their available fuel during under-frequency conditions.<sup>58</sup>

60. The CAISO states that the proposed tariff revisions in this filing are consistent with already existing low voltage ride-through provisions that are applicable to wind generators. According to the CAISO, the proposed revisions are intended to clarify that these standards apply to all asynchronous facilities, and to provide additional details to aid in enforceability and consistency of design.<sup>59</sup>

61. The CAISO proposes to adopt the following revisions to Appendix H of the LGIA:

- Separate the requirements for ride-through of single-phase faults with delayed clearing from those applicable to all normally cleared faults, in order to make clear that asynchronous generators must ride through the recovery phase of single-phase faults.
- Clarify that the low voltage ride-through provisions apply to all types of normally cleared faults, not merely three-phase (i.e., two-phase or single-phase faults).
- Establish criteria to define which breaker clearing time sets the “normal” clearing time for purposes of the ride-through requirements. Specifically, the CAISO proposes that the “normal” clearing time be defined as the lesser of the maximum normal clearing time for any three-phase fault which causes the voltage at the point of interconnection to drop to or below 0.2 per unit of nominal.
- Clarify that remaining on line does not require injection of power, but requires remaining physically connected.
- Clarify that the ride-through requirement applies to the facility, but does not necessarily require each individual unit to remain connected.

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<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

- Clarify that the ride-through requirements are not applicable to multiple-fault events.<sup>60</sup>

62. The CAISO states that it believes the new standards are just and reasonable. However, the CAISO further states that certain exemptions are appropriate. Thus, the CAISO proposes to exempt from the new low voltage ride-through requirements interconnection customers who demonstrate, as of May 18, 2010, a binding commitment to purchase inverters for thirty percent or more of the facility's maximum generating capacity that are incapable of complying with the new low voltage ride-through requirements.<sup>61</sup>

63. With regard to frequency ride-through requirements, the CAISO proposes to clarify the requirement of an ability to avoid disconnecting automatically or instantaneously for an under or over-frequency condition. The CAISO also proposes to clarify that facilities must comply with the off-nominal frequency requirements in the WECC Load Shedding Guide.<sup>62</sup>

## **2. Comments and Protests**

64. Lompoc Wind argues that a normal clearing time of 9 cycles is unreasonable. Lompoc Wind goes on to request that the CAISO model clearing times at the actual clearing time of the device, and, in the interest of reliability, direct their transmission owners to reduce normal clearing times to 4 cycles, with 9 cycles reserved for abnormal clearing times.<sup>63</sup>

65. Lompoc Wind also requests that the CAISO create a new schedule for ride-through service in order to compensate generators for modifications to comply with enhanced ride through requirements.<sup>64</sup>

## **3. Commission Determination**

66. The Commission accepts the CAISO's proposed tariff revisions regarding frequency and low voltage ride-through requirements, as applied to all asynchronous

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<sup>60</sup> *Id.* at 19-21

<sup>61</sup> *Id.* at 22.

<sup>62</sup> *Id.*

<sup>63</sup> Lompoc Wind Protest at 16-17.

<sup>64</sup> *Id.* at 17.

generators. The CAISO's proposed low voltage ride-through provisions are generally consistent with Commission precedent as related to wind generation.<sup>65</sup>

67. More specifically, in Order No. 661-A, the Commission stated that wind generating plants were required to remain online – i.e., ride through - during a three-phase fault with normal clearing,<sup>66</sup> with the normal clearing time defined as four-nine cycles (67-150 milliseconds). The duration of time that a wind generator was required to remain on-line while a fault was cleared was required to be specific to each wind generating plant location, but had a maximum of nine cycles.<sup>67</sup> The proposed CAISO provision is consistent with these requirements. Therefore, we find that CAISO's proposal is just and reasonable. Since we have found that the CAISO proposal is just and reasonable, we need not address the merits of Lompoc Wind's alternative proposal.<sup>68</sup>

68. We also find the CAISO's provision regarding multiple-fault events to be reasonable to prevent wind generators from paying excessive costs for enhanced ride-through capability. This also applies to the preceding voltage requirements.

69. Additionally, we find that the CAISO's proposal to clarify that existing ride-through requirements applies to all asynchronous generation is appropriate. We share the CAISO's concern that sympathetic trips could result in more severe system imbalances. The CAISO's proposal appropriately clarifies that article 9.7.3 is not intended to exempt certain resources from this requirement.

70. The Commission rejects Lompoc Wind's request for a new schedule to recover costs associated with the proposed voltage ride-through requirement. As a reliability-based condition of interconnection, all generators must have low voltage ride-through capability. Therefore, requiring a separate schedule is not necessary or appropriate.

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<sup>65</sup> See Order No. 661-A, FERC Stats. & Regs. ¶ 31,198 at Appendix G.

<sup>66</sup> Clearing refers to the operation of protective equipment to isolate and de-energize the short-circuited transmission element from the rest of grid. Normal clearing occurs when protective equipment operates as designed and isolates the short-circuit in the designed time period.

<sup>67</sup> See CAISO Transmittal Letter, Attachment D at 9.

<sup>68</sup> See, e.g., *New England Power Co.*, 52 FERC ¶ 61,090, at 61,336 (1990), *aff'd*, *Town of Norwood v. FERC*, 962 F.2d 20 (D.C. Cir. 1992) (rate design proposed need not be perfect, it merely needs to be just and reasonable), (citing *Cities of Bethany, et al. v. FERC*, 727 F.2d 1131, 1136 (D.C. Cir.), *cert. denied*, 469 U.S. 917 (1984) (utility needs to establish that its proposed rate design is reasonable, not that it is superior to all alternatives)).

71. We reject the CAISO's proposal to exempt from the new low voltage ride-through requirements interconnection customers who demonstrate, as of May 18, 2010, a binding commitment to purchase inverters for thirty percent or more of the facility's maximum generating capacity that are incapable of complying with the new low voltage ride-through because the proposal does not provide adequate notice to parties. Specifically, we find that May 18, 2010 does not provide adequate notice, as it occurred prior to both the CAISO filing with the Commission and the effective date of these tariff provisions. Instead, we find that July 3, 2010 should be substituted as the date by which interconnection customers must demonstrate a binding commitment to purchase inverters for thirty percent or more of the facility's maximum generating capacity that are incapable of complying with the new low voltage ride-through. July 3, 2010 reflects the effective date of these tariff revisions and thus affords parties adequate notice. Accordingly, we direct the CAISO to make a compliance filing within 30 days of the date of this order that is consistent with this finding.

72. Finally, we find the CAISO's frequency ride-through provisions to be just and reasonable and beneficial to ensuring system reliability, in addition to removing certain ambiguities in the CAISO's existing tariff. We conditionally accept the CAISO's proposed tariff revisions regarding frequency ride-through.

#### **D. Revisions to Generator Power Management Requirements**

##### **1. CAISO Filing**

73. The CAISO proposes to revise its generator power management requirements to maintain the reliability and security of the transmission system as variable energy resources displace conventional generators in the coming years. Specifically, the CAISO states that it is proposing to revise the following three related components of generator power management: (1) active power management; (2) ramp rate limits and control; and (3) frequency response.

74. With regard to active power management, the CAISO states that it is proposing to require that all asynchronous generators be capable of limiting active power output in increments of 5 MW or less in response to a dispatch instruction or operating order from the CAISO.<sup>69</sup> Further, the CAISO proposes to require that the asynchronous generating facility must provide Supervisory Control and Data Acquisition (SCADA) capability to

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<sup>69</sup> CAISO Transmittal Letter at 25.

transmit data and receive instructions from the participating transmission owner and the CAISO to protect system reliability.<sup>70</sup>

75. With regard to ramp rate limits and control, the CAISO notes that conventional generators typically have gradual ramp rates, whereas variable resources may have steep ramp rates that may cause reliability issues in accommodating ramps. Thus, to address this issue, the CAISO proposes to revise its LGIA to require each asynchronous generating facility to have the installed capability to limit power change ramp rates automatically, except for downward ramps resulting from decrease of the available energy resource for eligible intermittent resources.<sup>71</sup>

76. Finally, with respect to frequency response, the CAISO proposes to require that asynchronous generating facilities must have the installed capability to automatically reduce plant power output in response to an over-frequency condition. The CAISO proposes that the frequency response control be required, at the direction of the CAISO, to continuously monitor the system frequency and automatically reduce the real power output of the asynchronous generating facility in response to a rise in frequency.

77. The CAISO proposes to exempt, in part, those asynchronous generators who have, as of May 18, 2010, purchased equipment that is not compliant with the proposed new power management requirements. The CAISO states that it will coordinate with any generators who are in that position to develop requirements consistent with the capability of the equipment they have purchased and submit those requirements in a non-conforming LGIA. The CAISO requests that the Commission indicate its approval of this process so that the CAISO and developers have confidence that incorporating the exemption into future LGIAs will be favorably received by the Commission.

78. The CAISO requests that its proposed tariff revisions regarding generation power management be made effective as of January 1, 2012. The CAISO states that the proposed effective date is intended to accommodate a stakeholder process and any transition requirements that might emerge.

## **2. Comments and Protests**

79. Large-Scale Solar argues that the CAISO filing lacks key details about: (1) how generator compliance will be measured and/or how generator non-compliance will be

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<sup>70</sup> Similarly, the CAISO is proposing that the asynchronous generating facility must be able to receive and respond to automated dispatch systems (ADS) instructions and any other form of communication authorized in the CAISO tariff.

<sup>71</sup> CAISO Transmittal Letter at 26.

penalized; and (2) how the CAISO will use the capability provided by the revised standards. In particular, Large-Scale Solar claims that the power-management and ramp-rate control proposals would reduce the amount of energy a variable energy resource could produce, thus – under the energy-only payment structure in most variable energy resource power purchase agreements – reducing generator revenues. Without the commercial rules on how the CAISO will use this capability – not included in the revised standards in part because of the CAISO’s rush to file them – Large-Scale Solar asserts that it is impossible to assess the impact or reasonableness of the CAISO filing.<sup>72</sup>

80. Large-Scale Solar argues that the proposed standards rely, in part, on equipment that is either not available today or not available on a competitive basis, in particular with respect to the power management equipment. Large-Scale Solar states that this is a transitional but critical concern, because developers generally must order this equipment 18-24 months in advance of their commercial operation dates so the required equipment must be available in 2011 or before in order to meet the deadline. Additionally, Large-Scale Solar states that there will be many developers seeking to buy this equipment within a very short period, given the size of the interconnection queue. Thus, Large-Scale Solar contends that multiple vendors are critical for competitive-pricing reasons and for simple sufficiency of supply. Large-Scale Solar explains that three of the four vendor letters in the CAISO filing demonstrating equipment are from manufacturers that do not currently offer equipment to meet the standard but simply have plans to do so in the future, supposedly in time to meet CAISO deadlines. Large-Scale Solar contends that suppliers very often miss target dates, and new equipment often does not function as designed or promised. Moreover, Large-Scale Solar notes that the CAISO advisor supposedly confirming the reasonableness of this and the other revised standards is itself an affiliate of one of the manufacturers, i.e., is hardly an objective observer.<sup>73</sup>

81. Lompoc Wind contends that the 0.02 per unit figure included in the proposed power management requirements is overly restrictive and exceeds typical voltage changes due to transmission element switching events and transmission and generator contingencies. Lompoc Wind argues that this should be opened up to be no more restrictive than 0.05 per unit to protect against undue discrimination for asynchronous generators. Lompoc Wind argues that asynchronous generators should be compensated for the ramp down ancillary service being proposed through appropriate tariff schedules.<sup>74</sup>

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<sup>72</sup> Large-Scale Solar Protest at 4-5.

<sup>73</sup> *Id.* at 7.

<sup>74</sup> Lompoc Wind Protest at 19.



82. Sempra notes that as proposed the generator power management requirements would not become effective until January 1, 2012, after a CAISO stakeholder process is conducted in which the CAISO and stakeholders will “develop the requirements more fully.”<sup>75</sup> Sempra asserts that the CAISO anticipates that the stakeholder process will address issues such as: (1) the circumstances in which the power management capabilities will be triggered; (2) the operational or market protocols that will govern the hierarchy of generation reduction; and (3) the market rules that would apply to compensate for a generation reduction or to incent reduction in response to price signals.<sup>76</sup> Sempra claims that the CAISO goes on to recognize that “issues such as these must be resolved before the generator power management requirements go into effect.”<sup>77</sup> Given these unresolved issues, Sempra states it would be premature for the CAISO to “lock-in” the generator power management requirements at this early date.

83. Sempra argues that the stakeholder process and discussions, which the CAISO recognizes as necessary to conclude prior to the generator power management requirements going into effect, may result in additional information coming to light that would modify the approach to the generator power management requirements that are currently being proposed. Moreover, at a minimum, Sempra states that it appears that the stakeholder process will result in additional modifications to the CAISO Tariff, beyond those currently proposed in this filing, given the nature of the topics to be addressed. As such, in order to ensure a complete record with respect to the issues, Sempra asserts that the Commission should defer ruling on the proposed generator power management requirements until such time as the above-referenced stakeholder process is concluded.<sup>78</sup> Sempra claims that such a deferral would also allow time to ensure consistency with the outcome of the Commission’s Notice of Inquiry (NOI) relating to the integration of variable generation.<sup>79</sup>

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<sup>75</sup> Sempra Protest at 8 (citing CAISO Transmittal Letter at 23).

<sup>76</sup> *Id.* (citing CAISO Transmittal Letter at 29).

<sup>77</sup> *Id.*

<sup>78</sup> *Id.* at 8-9.

<sup>79</sup> Sempra cites to *Integration of Variable Energy Resources, Notice of Inquiry* FERC Stats. & Regs. ¶ 35,563 (2010), in which the Commission sought comment on the “extent to which barriers may exist that impede the reliable and efficient integration of variable energy resources [VERs] into the electric grid, and whether reforms are needed to eliminate those barriers.” *Id.*

84. CalWEA/AWEA argue that the CAISO's proposal to require interconnecting generators to enter into agreements obligating them to comply with power plant management protocols before the effective date of tariff provisions violates the filed rate doctrine. CalWEA/AWEA note that CAISO requests an effective date of January 1, 2012, for the generator power management protocols. CalWEA/AWEA argue that the CAISO's proposal to bind interconnection customers to contractual obligations under tariff provisions that are not in effect also violates the filed rate doctrine. CalWEA/AWEA state that the filed rate doctrine prohibits the Commission from permitting a tariff to take effect earlier than the date requested by the utility. According to CalWEA/AWEA, under the filed rate doctrine, service agreements cannot implement terms and conditions that are inconsistent with the underlying tariff.<sup>80</sup>

85. Additionally, according to CalWEA/AWEA, the CAISO's proposal to exempt projects from compliance with the generation power management protocols if they can demonstrate commitments to purchase certain equipment as of May 18, 2010, also violates the filed rate doctrine. CalWEA/AWEA claim that the CAISO's rationale for picking this date is that it is when the CAISO Board authorized its proposed tariff amendments. However, CalWEA/AWEA argue that this decision does not make the amendments effective because the amendments are subject to Commission review and acceptance under the Federal Power Act.<sup>81</sup>

86. Finally, CalWEA/AWEA claim that the CAISO recognizes that generation power management protocols remain to be developed through further stakeholder processes, which makes it particularly unreasonable to bind interconnection customers to tariff obligations that are merely conceptual. CalWEA/AWEA state that the interconnection standards that the CAISO proposes are required for grid reliability and are, by and large, standards with which wind generators already comply, or with which they readily can comply. CalWEA/AWEA are concerned with CAISO's generator power management proposal because, as acknowledged in its filing, there are a number of unresolved issues that will require further discussions with stakeholders to resolve. Additionally, CalWEA/AWEA explain that unlike fossil generation, which may have extended ramp rates depending on the particular type of generator, wind generation is capable of near instantaneous real power control. CalWEA/AWEA note that there is a considerable opportunity cost from the lost energy production associated with curtailing zero-emission, zero-fuel-cost wind output to make use of this capability. CalWEA/AWEA argue that the Commission should require the CAISO to clarify that the generator power

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<sup>80</sup> CalWEA/AWEA Protest at 7-8.

<sup>81</sup> *Id.* at 8.

management protocol will be used judiciously, and only as a last resort to maintain reliability.<sup>82</sup>

### 3. Commission Determination

87. The Commission agrees with Sempra and CalWEA/AWEA that the CAISO's proposed tariff revisions regarding generator power management requirements are premature. It is clear that significant issues related to the implementation and utilization of the CAISO's proposed power management tariff revisions remain to be determined through the course of an upcoming stakeholder process. The CAISO acknowledges as much in its filing.

88. We further agree with Sempra that further revisions to the CAISO tariff will be a necessary outcome from the upcoming stakeholder process. We disagree with the CAISO's argument that it is reasonable to place the standards into effect immediately while awaiting the outcome of the stakeholder process to determine the manner of implementation. Issues such as the operational or market protocols that will govern the hierarchy of generation reduction and the circumstances in which the power management capabilities will be utilized are of sufficient import to the affected stakeholders that it would not be just and reasonable to accept the CAISO's proposed tariff revisions at this time.

89. Accordingly, the Commission rejects the CAISO's proposed tariff revisions relating to generator power management requirements. This rejection is without prejudice to the CAISO re-filing tariff revisions regarding generator power management after it conducts the stakeholder process. The CAISO is directed to make a compliance filing within 30 days from the date of this order deleting the tariff revisions relating to generator power management requirements.<sup>83</sup>

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<sup>82</sup> *Id.* at 8-9.

<sup>83</sup> We note that the CAISO has proposed to create two new LGIAs, Appendices BB and CC under the MRTU Tariff, for interconnection customers who have entered into or been tendered one of the existing versions of the LGIA prior to the effective date of this tariff amendment, to continue with service under that version of the agreement. Appendix BB is for interconnection requests studied serially and Appendix CC is for interconnection requests studied as part of a queue cluster. Therefore, in following the Commission directive to delete tariff revisions relating to generator power management requirements the CAISO would delete section A v from Appendix H (technical procedures and requirements for asynchronous generators) of Appendix BB and replace it with section A vi3 from Appendix H of Appendices V and Z (the standard LGIA and the LGIA for queue cluster requests respectively).

**E. Miscellaneous Tariff Revisions****1. CAISO Filing**

90. The CAISO also proposes to revise its new LGIAs so as to exempt asynchronous generators from requirements to provide power system stabilizers.

91. Finally, the CAISO states that it has determined that provision of standard study models, where possible, will assist in expediting the large generator interconnection process and ensure better consistency and higher confidence in the accuracy of the study results. Thus, the CAISO proposes to revise its tariff to specify that, for each generator, the interconnection customer must provide the WECC-approved standard study models rather than user-defined models, to the extent such models are available.

**2. Commission Determination**

92. No party protested the CAISO's proposed tariff revisions to exempt asynchronous generators from the requirement to provide power system stabilizers, or to specify that interconnection customers provide standard study models to the extent such models are available.

93. The Commission finds the CAISO's proposed tariff revisions regarding power system stabilizers and standard study models to be just and reasonable and accepts these revisions.

**The Commission orders:**

(A) The CAISO's tariff revisions regarding Power Factor Design and Operations Criteria; regarding Voltage Regulation and Reactive Power Control; and regarding Generator Power Management Requirements are rejected.

(B) The CAISO's tariff revisions regarding Frequency and Low Voltage Ride-Through Requirements and the miscellaneous tariff revisions regarding exempting asynchronous generators from the requirement to provide power system stabilizers and standard study models are conditionally accepted for filing as discussed in the body of this order, effective July 3, 2010, as requested.

(C) The CAISO is hereby directed to make a compliance filing within 30 days of the date of this order, as discussed in the body of this order.

By the Commission.

( S E A L )

Kimberly D. Bose,  
Secretary.