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Grant Rosenblum
Mgr, Renewable Integration
CAISO

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Our reference BP
Date 2010-04-30

Interconnection standards initiative Draft straw proposal dated March 25, 2010

Dear Grant,

Siemens has reviewed CAISO's draft proposal for new variable energy resource interconnection standards and agrees with the intent and direction of the proposed rules.

Siemens will present this year the SINVERT PVS inverter together with our standard plant control system "PVS Control Box" to enable utility scale PV plants meet the proposed requirements put forth by CAISO.

SINVERT PVS inverter provides low voltage, zero voltage and high voltage ride-through and frequency ride-through capabilities. Since these capabilities are adjustable in a wide range it is our expectation that the final NERC/WECC ride-through requirements will be met.

Our plant level control system "PVS Control Box" provides for the following functions:

- Closed loop power factor control (e.g. power factor control with defined setpoint, voltage control based on Q(U) characteristic curve)
- Active power management for power limitation
- Restrict power ramp rates, both up and down, consistent with available insolation
- Over frequency droop functionality
- Interfaces for direct communication with ISO/TSO to receive setpoints (e.g. power limitation, reactive power) and commands and sends data

Siemens AG
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WEEE-Reg.-No. DE 23691322

It is our intention to offer these capabilities to our customers regardless of whether CAISO imposes this performance requirement.

Siemens is well aware of the reliability and operability challenges that come with the integration of renewable generation to the grid. Siemens agrees with the intent and direction of the CAISO proposed requirements and will offer products this year to meet the intent and direction of the proposed requirements.

Please let us know if you have additional questions.

Best Regards



Daniela Klein



May 7, 2010

To: Mr. Grant Rosenblum
Manager, Renewable Integration,
CAISO
151 Blue Ravine Road
Folsom, CA 95630

Subject: Interconnection standards initiative Draft straw proposal dated March 25, 2010

Dear Grant,

SMA Solar Technology America, LLC, a subsidiary of SMA Solar Technology AG (hereinafter referred to as SMA), has reviewed the document stated in the Subject line and as the world leader in inverter technology and installed PV capacity of over 7GW, SMA is pleased to endorse its support to the proposed interconnection requirements set forth by CAISO.

Since the summer of 2008, and thanks to the German Market MV Directive, SMA has taken steps to ensure that its products are compliant with various European interconnection standards to ensure "reliable PV penetration" on the grid. In light of these standards, our high efficiency Sunny Central line of inverters now being offered to the US market are already equipped with the following Grid Management features and Plant Control mechanism that we believe are in compliance with the interconnection standards being proposed in the Subject document:

- Active Power Curtailment and Control (set point control by Grid Operator)
- Power Factor Control and Adjustments (closed loop): the ability to control and adjust the Power Factor at the point of interconnection via various means:
 - Static or Fixed Setting
 - Dynamic Setting by the Grid Operator (set point command)
 - Automatic Adjustment based on Grid Voltage
 - Automatic Adjustment based on a pre-defined voltage schedule
- ZVRT, LVRT and HVRT capabilities
- Frequency Droop Control
- Ramp Rate Limiting with flexibility for different "ramp up" and "ramp down" values (assuming availability of sunlight and no intent to employ Energy Storage)
- Availability of SMA Dynamic Models in both PSLF and PSSE software for Dynamic Stability studies
- SCADA interface to EMS control centers for point telemetry and remote control
- OPC interface to Historian Systems for data archive and storage

We are also pleased to share with you that SMA has met with various US utilities (some of which are CAISO participants and most of which are WECC members) and reliability coordinators within the NERC region and they welcome the Grid Management features that our utility scale PV products are able to provide to make their system more reliable. Some utilities even expressed desire to have these standards implemented on Distributed Generation Systems if a high level of variable generation is to penetrate their network.



As the world leader in power conditioning systems, and now that the market has shifted from the PV business to being in the energy generation business, SMA is well aware of the operational, resource scheduling/coordination, and transmission challenges that utilities, ISOs and Reliability Coordinators are faced with in order to ensure a high level of variable generation penetration on the grid. While we still intend to comply with the current set standards by IEEE and UL, we also intend to keep offering our Grid Management features as a value proposition to our clients regardless of whether CAISO imposes these performance standards. We believe in the Smart Grid of the future and our value proposition in the form of the Grid Management features listed herein and which are in accordance with the CAISO proposed standards, is an essential building block of the Grid of the Future.

Should you have any questions, please feel free to contact our SMA America team anytime.

Kind Regards;

A handwritten signature in black ink, appearing to read "Elie Nasr", is centered within a light blue rectangular box.

Elie J. Nasr
Business Development
Utility Scale Projects

May 10, 2010

Grant Rosenblum
Manager, Renewable Integration
California ISO
151 Blue Ravine Road
Folsom, CA 95630

Re: Interconnection Standards Initiative
"Draft Straw Proposal" - March 25, 2010

Mr. Rosenblum,

Advanced Energy (AE) has reviewed CAISO's draft proposal for the new variable energy resource grid interconnection standards. AE agrees with the intent and direction of the proposed requirements.

In 2010, Advance Energy intends to introduce a PV site utility control system and Solaron Grid-Tied Inverter options with the goal of enabling utility scale PV installations to meet the proposed requirements put forth in the CAISO "Draft Straw Proposal" as well as the requirements of utility regulatory agencies around the world.

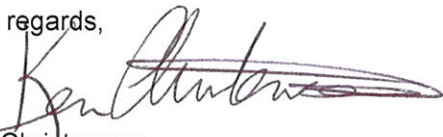
The Solaron Grid-Tied Inverters are planned to be equipped with Low-Voltage, High Voltage, and Zero Voltage Ride-Through as well as frequency ride-through capabilities. When implemented, these features will be adjustable to meet local grid interconnection standards and we expect that all CAISO requirements will be met.

The AE PV site utility control system is slated to provide:

- Interfaces to receive remote commands for Active and Reactive set point control
- Active Power Management (limitation and curtailment)
- Reactive Power (power factor) Control
- Ramp Rate Restrictions

AE understands the challenges of integrating variable energy sources with the grid. AE will be offering solutions that will enable our customers to meet the proposed CAISO interconnection requirements.

Best regards,



Ken Christensen
Solaron Product Management



GE Energy
Minesh Shah
Renewable System
Platform Leader
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Date: April 13, 2010

To: Grant Rosenblum
Mgr, Renewable Integration,
CAISO
151 Blue Ravine Road
Folsom, CA 95630

Subject: Interconnection standards initiative
Draft straw proposal dated March 25, 2010

Dear Grant,

GE Renewable Energy, a division of GE Power & Water, GE Energy, has reviewed CAISO's draft proposal for new variable energy resource interconnection standards. GE has consistently taken the legitimate reliability concerns and operating challenges posed by variable renewable generation seriously, and we agree with the intent and direction of the proposed rules.

GE's wind turbines are in operation around the world and meet a broad range of voltage and frequency ride through requirements, similar to the rules proposed by CAISO. In addition to supplying wind turbines, GE presently offers plant level control systems that provide automatic voltage regulation and active power management at the point of interconnection (POI). In most cases the capabilities of GE's wind turbine and wind plants, on its own, enable owners and/or developers of wind plants to meet the requirements at the POI, as outlined in the proposal by CAISO. The plant level control system also has the ability to provide coordinated control of balance of plant equipment (e.g., capacitor banks) if such equipment is needed to meet the requirements at the POI.

In reference to utility scale solar PV plants, GE presently offers the Brilliance™ inverter and SunIQ, a plant level control and monitoring platform, to enable utility scale solar plants

meet the proposed requirements put forth by CAISO. The GE Brilliance™ inverter provides low voltage, zero voltage and high voltage ride-through and frequency ride-through capabilities. While final resolution of NERC/WECC ride-through requirements are on-going, it is GE's expectation that the requirements can be met.

The SunIQ platform, which is a plant level control and monitoring system, provides for the following function:

- 1) Closed loop voltage (or power factor) control at the point of interconnection,
- 2) Active power management for power curtailment
- 3) Restrict power ramp rates, both up and down, *consistent with available sunlight*. (GE does not intend to include energy storage as a standard feature.)
- 4) Over frequency droop functionality
- 5) Interfaces for direct communication with ISO/TSO to receive data and send commands (e.g., power curtailment)

As indicated in the CAISO's draft proposal, grid integration capabilities at the present time do not apply to PV installations that are embedded with load on distribution systems. GE believes further industry resolution of conflicts between existing IEEE and UL standards and grid interconnection requirements of this type must be made even in distribution systems.

While GE understands the intent of the proposed standard, it is our intention to commercially provide these capabilities in our products *regardless of whether CAISO imposes this performance requirement*. GE believes that "grid friendly" solar power plants are a cost competitive offering for the utility scale solar PV plant in comparison with lower functionality, non-grid friendly PV plant offerings. In addition to the benefits of these features to the grid, GE also believes there is substantial value to our customers, those owning and operation PV plants, in terms of improved voltage management, reduced plant equipment stress, and reduced risk of excessive power curtailment for reliability reasons.

As indicated earlier, GE does recognize the reliability and operability challenges posed by variable renewable generation and the need for grid regulations to continue to promote the integration of renewable generation to the grid. As an OEM of renewable power generation equipment, GE agrees with the intent and direction of the CAISO proposed requirements, and GE offers products today to meet the intent and direction of the proposed requirements.

If there are questions, the GE team is available to answer the questions.

Best regards,
Minesh Shah
Platform Leader, Renewable Systems
GE Energy