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June 7, 2021

Via Electronic Submission via <http://www.regulations.gov>

The Honorable Patricia A. Hoffman
Acting Assistant Secretary of Energy
Office of Electricity
Washington, DC

Re: Response of SMA America to Bulk-Power System (BPS)
Request for Information (RFI), 86 Fed. Reg. 21309 (April 22, 2021)

Dear Mr. Secretary:

This letter responds to the Department of Energy (DOE's) Request for Information, 86 Fed. Reg. 21309 (April 22, 2021), (RFI), concerning Bulk Power System (BPS) cybersecurity. We do so on behalf of SMA Solar Technology America (SMA). We appreciate the opportunity to comment. On August 24, 2020, we commented in response to the prior DOE RFI about BPS cybersecurity concerns, 85 Fed. Reg. 41023 (July 8, 2020).

Background

SMA is one of the leading suppliers of solar inverter, battery energy storage, and related equipment, such as transformers, switch gears, and DC converters, and a provider of services of PV and battery energy storage in the United States for home, commercial, and utility markets. SMA's inverters and battery energy storage equipment are key components of the renewable energy solution for the United States. SMA's inverters convert the DC energy produced by PV (solar) panels or Battery systems into AC energy used by homes, commercial entities, utilities and the public electrical grid. According to the energy research and consulting firm Wood Mackenzie, the PV market in the United States should total about 18 GW of projects in 2020. Using the power output of the anticipated 2020 PV projects and the power output of SMA inverters projected for sale in 2020, SMA estimates that it would have a 25-

30% market share of the total PV market across home, commercial, and utility segments in the United States in 2020.

SMA is headquartered in Rocklin, California. SMA is responsible for the direct employment of approximately 300 individuals throughout the United States. These individuals work in 26 states, including California, Texas, New York, New Jersey, Pennsylvania, North Carolina, Colorado and Florida. SMA is doing business in 35 states, Puerto Rico and Washington, D.C.

Summary

1. Scrutiny of the manufacturers and vendors of certain types of inverters and battery energy storage equipment for Foreign Ownership, Control or Influence (FOCI) is an appropriate step to safeguard the security and stability of the bulk-power system (BPS). Inverters and battery energy storage equipment are intelligent devices and contain many controllers and programmable components that can autonomously control the inverter and battery energy storage equipment independent of the SCADA (Supervisory Control and Data Acquisition) system. The SCADA system does not block the autonomous operation of the inverter and battery storage equipment, devices that could be used to disrupt the bulk power system. Controllers and programmable components manufactured and programmed by Foreign Adversaries may be a significant security vulnerability. Furthermore, inverters and battery energy storage equipment have a basic two-way data transfer capability built into them in order to communicate with controllers and potentially through them into the BPS. Scrutiny of inverters and battery storage equipment designed, developed, and manufactured, imported and sold without SCADA, but used on utility scale generation projects, should be included in the scope of equipment reviewed to implement the Executive Order. For inverters and battery energy storage equipment used in utility scale generation projects, these inverters are only a few steps removed from the BPS, similar to a cell tower in a mobile phone network. In this analogy, residential and commercial inverters and battery energy storage equipment are more like individual mobile phones in their proximity to the BPS and in their much lower potential to be used for cyber-attacks on the BPS.
2. Purchasers, manufacturers, and suppliers of inverters and battery energy storage equipment all need clarity from DOE in any rule over what models of inverters and battery energy storage equipment are covered for purposes of FOCI scrutiny. Although inverters and battery energy storage equipment are not specifically mentioned in the definitions of Bulk-Power System or Bulk-

Power System Equipment included in E.O. 13920 and the previous Request for Information, see 85 Fed. Reg. at 41024, parties purchasing such equipment have demanded that equipment vendors, such as SMA, represent and warrant compliance with E.O. 13920 and rules to be issued pursuant to that initiative. These demands have included commitments to refund payments if the equipment does not comply with E.O. 13920.

On December 17, 2020, the then Secretary of Energy released a Prohibition Order (“Prohibition Order”), which prohibited the acquisition, importation, transfer and installation of certain BPS equipment. The Prohibition Order was subsequently suspended on January 20, 2021. The Prohibition Order would have been disruptive to the BPS equipment supplies and would have resulted in order cancellations and potentially require the removal and replacement of the listed BPS equipment of Foreign Adversaries. Additionally, the Prohibition Order did not address the security vulnerabilities to the BPS of controllers and programmable components manufactured or supplied by Foreign Adversary countries. Although SMA supports the suspension and revocation of the Prohibition Order effective as of April 20, 2021, the release, suspension and revocation of the Prohibition Order have only further contributed to the confusion and uncertainty in BPS equipment supply market. Another prohibition order may cause similar market disruption that a certification procedure, discussed below, would help avoid.

3. SMA recommends that DOE implement a certification procedure for inverters and battery energy storage equipment used in utility scale PV projects. Under such a certification procedure, the sellers of such equipment would certify that the sellers and manufacturers of such utility scale equipment are NOT subject to FOCl and that the seller must provide these certifications to DOE. After review of such certifications, DOE would create an “approved list,” of pre-certified models that utility customers would know in advance are already in compliance. After a model has been included on the “approved list”, it would also be identified with a label to the effect of “certified for use on utility scale projects.” All other models that were not on the “approved list”, including, for example, models for use for residential and commercial projects, would be identified with a label to the effect of “not for use on utility scale projects.” These “not for use on utility scale projects” would not be subject to the FOCl review procedures. This approach would provide needed clarity to the market and to Customs and Border Protection (CBP) in helping to enforce any such BPS rule. At the same time, it would facilitate the movement of compliant equipment without unnecessary delays while DOE makes certification decisions. The

California Energy Commission uses a similar list based certification procedure to demonstrate compliance with its energy conservation standards for its appliance efficiency standards. See, e.g., <https://cacertappliances.energy.ca.gov/Pages/ApplianceSearch.aspx>

4. In creating the “approved list,” SMA recommends that a time-limited waiver procedure be included for an identified list of insubstantial items of equipment related to inverters and battery energy storage equipment used in utility scale projects (related items) for a period of one year under strict pre-conditions. This waiver process would avoid disrupting existing orders and also allow a time for relocating solely assembly work currently in a Foreign Adversary country either to the United States or to an allied country. This time-limited waiver of the FOCl certification requirement from DOE would be available only where:
 - a. the programming is done, and the programmable parts are provided by, entities that are not nationals of the Foreign Adversary country;
 - b. but only assembly occurs in the Foreign Adversary country with assembly to be explicitly defined in the implementing regulations to exclude any design, development or programing and to be strictly limited to putting together discrete parts.

The applicant for the waiver would certify to these conditions, including the absence of Foreign Adversary ownership or control of the affected equipment manufacturer.

5. SMA also recommends that more granular FOCl scrutiny of components and sub-vendors in the inverter and battery energy storage arena is not warranted until the BPS system has first been addressed, since the costs of such additional supply chain scrutiny are quite substantial and the national security benefits very small. If, and when the vendors and manufacturers of components for utility-scale inverters and battery energy storage equipment become subject to FOCl scrutiny, that scrutiny should focus on the programmable communication components, and circuit boards, not on passive individual parts such as resistors, transistors, connectors, and the like.
6. SMA does not recommend the issuance of a prohibition order to prohibit the acquisition, transfer, or installation of certain bulk-power system equipment sourced from Foreign Adversary countries. Since EO 13920 was issued, SMA has had customers demand that SMA warrant and represent that the SMA inverters and / or battery energy storage devices do not violate E.O. 13920 as well as rules yet to be promulgated. These customers have also demanded language that SMA reimburse the customer for all costs incurred to install and remove the

equipment and to refund the price of the inverters and / or battery storage devices if the warranty or representation is inaccurate. A prohibition order will likely result in disruption in the energy equipment markets and to increase costs to cover the potential liability to refund customers their costs. The certification process outlined above is a better approach. Such a process allows the market to decide which inverters and / or batter storage device on an approved list to buy.

Response to DOE Questions Potentially Relevant to SMA as a Vendor of Inverters and Battery Energy Storage Equipment

Question A-2. “What specific additional actions could be taken by regulators to address the security of critical electric infrastructure and the incorporation of criteria for evaluating foreign ownership, control, and influence into supply chain risk management, and how can the Department of Energy best inform those actions?”

Answer: BPS is the backbone of the nation’s energy infrastructure and is fundamental to national security. It is critical that the BPS is secure against attacks and exploitation from foreign adversaries, which will seek to target critical electrical infrastructure. Scrutiny of the manufacturers and vendors of certain types of inverters and battery energy storage equipment for Foreign Ownership, Control or Influence (FOCI) is an appropriate step to safeguard the security and stability of the bulk-power system (BPS).

Inverters and battery energy storage equipment used in utility scale generation projects are only a few steps removed from the BPS. Inverters and battery energy storage equipment are intelligent devices and contain controllers and programmable components that can autonomously control the inverter and battery energy storage equipment independent of the SCADA system. The SCADA system does not block the autonomous operation of the inverter and battery storage equipment, devices that could be used to disrupt the bulk power system. Controllers and programmable components manufactured and programmed by Foreign Adversaries may be a significant security vulnerability. Inverters and battery energy storage equipment have a basic two-way data transfer capability built into them in order to communicate with controllers and potentially through them into the BPS. Scrutiny of inverters and battery storage equipment designed, developed, and manufactured, imported and sold without SCADA, but used on utility scale generation projects, should be included in the scope of equipment reviewed to implement the Executive Order.

FOCI scrutiny of smaller inverters used in residential and commercial applications pose lower potential to be used for cyber-attacks on the BPS. They do not directly connect to the BPS.

SMA suggests the DOE write its rule to focus FOCI scrutiny on manufacturers and vendors of inverters and battery energy storage equipment used in utility scale PV installations, using the procedures described in the Summary. This process would require a certification by the vendor and manufacturer that the model is not designed, built or programmed by a company subject to FOCI. This model certification approach would minimize market uncertainty and provide a “safe harbor” for permissible PV equipment made by companies not subject to FOCI.

If DOE decides to address FOCI for the manufacturers and vendors of components used in inverters and battery energy storage equipment, SMA recommends that DOE limit the FOCI review to manufacturers and vendors of the programmable communication components, and circuit boards in the inverter and battery energy storage equipment, rather than on passive individual parts such as resistors, transistors, connectors, and the like used in such equipment.

Question A-3:

What actions can the Department take to facilitate responsible and effective procurement practices by the private sector? What are the potential costs and benefits of those actions?

ANSWER:

Since the issuance of the Executive Order, SMA, as a vendor of inverters and battery energy storage and associated equipment, has had energy sector asset owners seek to impose FOCI screening requirements on it. Asset owners make these demands because of the uncertainty created by the broad, vague language of the Executive Order and the issuance and retraction of the Prohibition Order; it is easiest for asset owners to insist that vendors *of all kinds of equipment* guarantee unconditionally that their equipment will comply with rules that have not yet been written. In essence, absent guidance from DOE, the growing demands of the marketplace are for all vendors to conduct FOCI screening of all their suppliers, down to the individual commodity component level. The August 11, 2020, Sungrow comments, pp. 8-9, also describe turmoil in the solar energy equipment market created by uncertainty over the scope and implementation of the BPS Executive Order. Although there are no U.S. base inverter suppliers, there are enough inverter suppliers from non-Foreign Adversary countries with sufficient capacity to meet the needs for PV equipment at utility scale.

SMA believes that the certification procedures described above for equipment used in the utility-scale PV and battery energy storage projects would achieve the objectives of E.O. 13920 in a balanced way taking into account the risks and costs.

If DOE decides also to address FOCl for the manufacturers and vendors of components used in inverters and battery energy storage equipment, SMA recommends that DOE focus on equipment used in utility scale projects and to limit FOCl review to manufacturers and vendors of the programmable communication components, and circuit boards, rather than on passive individual parts such as resistors, transistors, connectors, and the like used in such equipment. Small business is not yet prepared to extend FOCl screening to all models and all sub-vendors and components; DOE insistence on doing so will be quite costly. Moreover, the return on such screening will be quite small with respect to risk mitigation.

SMA recommends that DOE implement a waiver procedure described above for an identified list of insubstantial items of equipment related to inverters and battery energy storage equipment used in utility scale projects (related items) under strict pre-conditions. This waiver process would avoid disrupting existing orders and also allow a time for relocating solely assembly work currently in a foreign adversary country either to the United States or to an allied country. The applicant for the waiver would certify to these conditions, including the absence of foreign adversary ownership or control of the affected equipment manufacturer.

Questions A.4. Are there particular criteria the Department could issue to inform utility procurement policies, state requirements, or FERC mandatory reliability standards to mitigate foreign ownership, control, and influence risks?

ANSWER:

SMA suggests the DOE adopt FOCl scrutiny on manufacturers and vendors of inverters and battery energy storage equipment with or without SCADA device used in utility scale PV installations. Inverters and battery energy storage equipment have basic two-way data transfer capability in order to communicate with controllers and potentially through them into the BPS. If the DOE adopts a FOCl review of components, the review should focus on manufacturers and vendors of the programmable communication components, and circuit boards, rather than on passive individual parts such as resistors, transistors, connectors, and the like used in such equipment.

DOE can minimize the economic impact of such demands on small business parts and components suppliers by providing a clear and simple certification process for vendors to declare, on a model-by-model basis, that the PV and battery energy storage equipment is NOT designed, built, or programmed by companies subject to FOCl.

Small business is not yet prepared to extend FOCl screening to all models and all sub-vendors and components; DOE insistence on doing so will be quite costly. Moreover, the return on such screening will be quite small with respect to risk mitigation. If DOE decides to require FOCl screening of any sub-vendors, SMA strongly recommends deferral of any such certification process, in order to give vendors the opportunity to review their supply chains in an orderly fashion and to arrange for substitute suppliers without incurring substantial costs resulting from sudden changes. If FOCl scrutiny is to be extended to component suppliers, SMA strongly recommends that such FOCl scrutiny focus only on programmable communication items rather than passive individual components such as resistors, transistors, and connectors.

Response to Questions B-1 through B-4. For reasons stated above, SMA believes that a certification procedure for a broader array of major items in the bulk power and utility scale power systems will prove far easier to implement and to administer than a system using Prohibition Orders, and provide at least as much protection.

CONCLUSION

SMA appreciates the opportunity to comment. We recommend that DOE:

1. Implement a FOCl certification procedure for all inverters and battery energy storage equipment capable of use in utility scale PV and battery energy storage projects. This procedure would result in an "approved list" of pre-certified equipment for use and labeling of those pre-certified equipment as "certified for use on utility scale projects." All other inverters and battery energy storage equipment not on the "approved list" would be labeled as "not for use on utility scale projects," which would include home and commercial inverters. The vendors and manufacturers of inverters and battery storage equipment not included on the approved list and labeled as "certified for use on utility scale projects" would not be subject to the FOCl requirements. This process would provide utility customers with an easy and available reference to check

compliance and an easy identifiable label on all certified and non-certified inverters and battery energy storage equipment.

2. Require as a pre-condition for inclusion on the “approved list” of pre-certified inverters and battery energy storage equipment that the seller and manufacturer must certify that the equipment is not designed, built or programmed by any party subject to FOCI and that the seller must provide these certifications to the DOE.
3. Implement a waiver procedure for an identified list of insubstantial items of equipment related to inverters and battery energy storage equipment used in utility scale PV projects in narrowly defined circumstances, including that these items of related equipment must be programmed or contain programmable parts provided by entities that are not nationals of a foreign adversary, while requiring prompt relocation of assembly work to the United States or an allied country during the limited waiver period, in order to avoid disrupting current projects and those in current planning stages.
4. Defer any more granular FOCI certification requirement for components used in inverters and battery energy storage equipment until the approved list of pre-certified “FOCI-free” inverters and battery energy storage equipment has been established and functioning for a year. This phased approach would avoid, for example, any unnecessary, disruptive, and expensive “rip and replace” work and/or delays to ongoing projects. The objective is to strike the balance contemplated by E.O. 13920 and the RFI between combatting the risks as soon as practicable and mitigating the economic impacts.
5. If DOE decides to proceed with FOCI review of component vendors used by “FOCI-free” manufacturers who make inverters and battery energy storage equipment, DOE should limit any such FOCI review obligation and certification process of component vendors to the programmable communication components, and circuit boards and not require such FOCI review for passive individual parts such as resistors, transistors, connectors, and the like.
6. A Prohibition Order will likely result in disruption in the energy equipment markets and to increase costs to cover the potential liability to refund customers their costs. The certification

process outlined above is a better approach. Such a process allows the market to decide which inverters and / or battery storage device on an approved list to buy.

Respectfully submitted,

A handwritten signature in black ink that reads "Phillis J. Ing". The signature is written in a cursive, flowing style.

Phillis Ing

Head of Legal for the Americas