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Sent: Tuesday, March 06, 2018 6:46 AM
To: Sisto, Carolyn
Cc: Watson, Graham CTR (Volpe); Mesrobian, Amy E.; Harris, Brendan (Volpe)
Subject: RE: VGI Working Group Draft Report Available for Comment

Carrie,

1. There are 2 references to EVSE software updates in the report:

- page 33: *Ensures utility or network service provider can provide software updates remotely, without hardware modifications or site visits*
- page 38: *SDG&E stated that for their proposed Residential Charging Infrastructure proposal, they are proposing Level 2 EVSE that are wifi enabled and support field upgrading of software.*

There is NO mention of having digitally signed firmware and encryption (which should be specified) for the EVSE over-the-air (OTA) or USB updated processes and this is a major cybersecurity issue. The OTA EVSE capability could be used by hackers to install malware on EVSEs that could propagate to other interfaces, such as the EVs, smart meters, DER, building energy management systems (BEMS), grid, etc.

So there are 2 cybersecurity controls that should be implemented:

- **Signed Firmware:** New update packages (firmware, operating system, apps) should have their authenticity and integrity verified cryptographically with public/private key pairs. We do not recommend using symmetric keys to encrypt firmware, as the key must then be embedded in the device and key-reuse becomes a risk. An update package should be signed with a private key that corresponds to a public key known to the device. A Certificate Authority or similar Public Key Infrastructure may be used to improve key management. This verifies that the downloaded update has not been modified and was signed by the vendor (who has the private key.) Information and guidance can be found within NIST SP 800-53 Control SI-7: SOFTWARE, FIRMWARE, AND INFORMATION INTEGRITY <https://nvd.nist.gov/800-53/Rev4/control/SI-7> to cryptographically signing and encrypting firmware to prevent modification by an unauthorized entity.
- **Transport Encryption:** Properly signed firmware with good key management should be secure, even if downloaded from sources other than the vendor. Encrypting the update, either at the file or network level, provides some additional protection. Using Secure Socket Layer (SSL) or Transport Layer Security (TLS) are common ways to encrypt network traffic and is sometimes used to authenticate the source of an update as well.

2. Another comment is the Report should recommend the use of both of the following cybersecurity best practices:

- **EVSE Third Party Independent Penetration Testing:** Penetration testing should be conducted during the design phase, before final production and field operations (after deployment and/or periodic) . Information and guidance can be found within NIST SP 800-53: CA-8 – PENETRATION TESTING - The organization performs penetration testing at an organization-defined frequency on organization-defined systems or system components, <https://nvd.nist.gov/800-53/Rev4/control/CA-8>. In a system with diverse technologies such as a EVSEs and associated

services, different components are likely to be produced by different vendors and the back-end systems need to be tested for cybersecurity. The most reliable method of ensuring awareness of system vulnerabilities and cross checking against vendor supplied documentation regarding the security posture of a system/component is to have a third-party, i.e. an entity not beholden to the Utility, EVSE vendor, etc. perform an independent penetration and/or security assessment. Penetration testing is a process used to attempt to evaluate the security of a system/component by safely identifying and exploiting vulnerabilities.

- **Vulnerability Disclosure Program (for EVSE vendors):** It is recommended that EVSE manufacturers and/or maintainers of devices institute a “vulnerability disclosure and response program” for receiving, implementing, and addressing vulnerabilities discovered or reported in their products. Vendors should maintain a vulnerability response and disclosure program in accordance with established standards such as International Organization of Standards (ISO)/International Electrotechnical Commission (IEC) 29147:2014 (*Information technology -- Security techniques -- Vulnerability Disclosure*) and ISO/IEC 30111:2013 (*Information technology -- Security techniques -- Vulnerability Handling Processes*). This is a valuable resource to aid the Energy sector in assessing the implementation of a vulnerability response program. EVSE vulnerabilities that are discovered should be reported to the vendor(s), but also the EVSE purchasers should utilize procurement language that requires vendors have a vulnerability disclosure plan and program that meets or exceeds the ISO/IEC standards http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=45170 http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=53231 and also includes elements of the National Telecommunications and Information Administration (NTIA) Coordinated Vulnerability Disclosure Template, http://www.ntia.doc.gov/files/ntia/publications/ntia_vuln_disclosure_early_stage_template.pdf

v/r,

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Advancing transportation innovation for the public good

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Subject: VGI Working Group Draft Report Available for Comment

Dear Working Group Participants,

Today CPUC Commissioner Peterman issued a ruling Seeking Comment on Vehicle-Grid Integration Communication Protocol Working Group Energy Division Staff Report. The ruling, which includes the report as an attachment, and all related working group materials are available at: www.cpuc.ca.gov/vgi.

Opening comments on the draft report are due by March 21, 2018. Reply comments are due by April 4, 2018. The ruling provides instructions on how to submit your comments for consideration.

Best,

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Cc: Kiss, Elizabeth; ALJ Process

Subject: Official Email Service of R.13-11-007 CMMR. Ruling

This e-mail provides service of Commissioner Peterman's Ruling Seeking Comment on Vehicle-Grid Integration Communication Protocol Working Group Energy Division Staff Report. The full text of this ruling is made available through the link provided below on February 23, 2018.

<http://docs.cpuc.ca.gov/SearchRes.aspx?docformat=ALL&docid=211654688>

In the event of problems with the e-mail or the internet link, please contact Stephanie Franco at sf3@cpuc.ca.gov, telephone # (415) 703-1971