

SED DATA REQUEST
SED-SDG&E-DR-01
SDG&E SB 350 TRANSPORTATION ELECTRIFICATION PROPOSALS (A.17-01-020)
SDG&E RESPONSE
DATE RECEIVED: March 17, 2017
DATE RESPONDED: March 31, 2017

DATA REQUEST

Enclosed with this letter is a data request. I recognize that this is a short deadline, so if it is infeasible, please contact me to discuss.

In light of the Prehearing Conference held on March 16, 2017; the Administrative Law Judge may instruct Applicants to formally file their Data Responses.

SED SCE DR1701021-001

The Assigned Commissioner's Ruling dated September 14, 2016 for R.13-11-007 states in Section 3.4.2 that Transportation Electrification (TE) Applications should seek to conform to the following guidelines:

- Promote driver, customer and worker safety (Section 3.8)
- Identify a Vehicle Grid Integration Communication Standard. (Section 3.10)

Please coordinate with the other IOU Applicants such that the responses can be used to work towards a joint safety plan for the Transportation Electrification proposals.

1. Per Section 3.8, how is the IOU ensuring that the construction, interconnection, and operation of projects in their TE portfolio are accounting for the safety of utility workers, the electricity customer, and the drivers of the TE technology?

SDG&E's Response: SDG&E is committed to ensuring that safety is a priority in our proposed SB 350 projects,¹ and will provide safe, reliable service and equipment to support TE.² Below are the various safety requirements that SDG&E has worked into the RFP specifications for the charging equipment (prior to construction), the qualifications that SDG&E requires from participating contractors (during construction), and the operational features and requirements specified by SDG&E that will ensure safe operation when the equipment goes in service.

EV charging equipment safety requirements specified in RFP to vendors:

- Requirement for UL listed charging equipment or successfully passing testing by a Nationally Recognized Testing Lab
- Compliance with Society of Automotive Engineers (SAE) J-1772 Standard (electrical connector standard for safely connecting the EVSE to the car)
- Compliance with National Electrical Code Article 625 (which covers many electrical safety issues associated with EVSE, such as the inclusion of a charge circuit interrupting device - CCID)

¹ Michael Schneider's Chapter 1 testimony on page MMS-15.

² Linda Brown's Chapter 2 testimony on page LB-37.

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- Compliance with Americans with Disabilities Act (ADA) per the Authority Having Jurisdiction (AHJ) where the EVSE will be installed (ensures safe and accessible charging station installation for handicapped drivers)
- EVSE must be installed in a NEMA 3R enclosure or better, rated for outdoor use (weather resistant enclosure provides additional safety).

Safety considerations during construction:

- Contractors must have Electric Vehicle Infrastructure Training Program (EVITP) certification
- All work not performed by employees of SDG&E shall be performed by contractors that are signatory to the IBEW who hold a valid C-10 contractor's license
- Installations will be designed per Article 625 of the National Electrical Code.

Operational safety considerations:

- Overcurrent protection associated with utility transformers and distribution circuits that feed power to the charging stations
- Overcurrent protection in the meter pedestal / circuit breaker panel that feeds each of the charging stations
- Bollard equipment protection installed where appropriate
- Concrete parking stops to protect equipment where appropriate
- SAE J-1772 Standard for EVSE-to-car connection that prevents energization of charging cord plug when not connected to vehicle
- SAE J-1772 Standard prevents car from going into "D" or "R" when plugged in or charging
- SAE J-1772 Standard isolates power from the car when the car charging cord handle release button is pressed to immediately disconnect power from car.

2. Specifically, how is the IOU's ensuring VGI programs that schedule the recharging or discharge of a driver's vehicle batteries are designed with technologies that treat the preservation of customer's mobility preferences as a paramount safety concern?

SDG&E's Response: SDG&E's proposed SB 350 programs offer a "recharging" function, but will not have the ability to schedule a "discharge" of a driver's vehicle battery.

Except for SDG&E's Airport Ground Support Equipment project³, SDG&E's proposed SB 350 programs have been designed with innovative hourly day-ahead rates that customers can use to plan and schedule their EV charging needs based on price and miles needed. Vehicle charging prices vary by the time of day, distribution circuit loading, and power system loading, and are meant to

³ SDG&E's Airport Ground Support Equipment project will be billed on the existing standard commercial TOU rate that the Airport is currently on because of the Airport's desire to integrate the project with their 5.5 MW solar PV system.

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send appropriate pricing signals to drivers to charge when the grid is less congested or when renewables are more plentiful. Customers have the ultimate decision on whether their vehicle will charge or not, based on the maximum allowable hourly price they set on the system.

3. How is the IOU addressing any safety related issues in relation to conforming their Electric Rule 21 to accommodate Society of Automotive Engineers Standards for certifying the safety of grid-connected electric vehicles in order to reduce barriers that prevent electric transportation from acting as storage devices?

SDG&E's Response:

None of SDG&E's proposed SB 350 priority review projects nor its standard review program (Residential Charging) plan to incorporate vehicles acting as storage devices (e.g., vehicle-to-grid [V2G] use cases).

Nonetheless, SDG&E requires all inverter based generators and batteries, including V2G projects, to comply with the UL 1741 certification requirements of Electric Rule 21. UL 1741 is the Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources. UL 1741 is used in conjunction with IEEE 1547, the Standard for Interconnecting Distributed Resources with Electric Power Systems.

SDG&E requires conformance to all other safety related rules and requirements in Electric Rule 21 by all interconnecting inverter based generators and batteries, including V2G projects.

In addition, outside of SDG&E's SB 350 project and program proposals, SDG&E is investigating Electric Rule 21 changes necessary to accommodate Society of Automotive Engineers (SAE) standard J3072⁴ - Interconnection Requirements for Onboard, Utility-Interactive Inverter Systems. SAE standard J3072 "establishes interconnection requirements for a utility-interactive inverter system which is integrated into a plug-in electric vehicle (PEV) and connects in parallel with an electric power system (EPS) by way of conductively-coupled, electric vehicle supply equipment (EVSE)."

Standard J3072 incorporates several UL safety standards, including:

- UL 1741 Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources
- UL 2202 Standard for Safety for Electric Vehicle (EV) Charging System Equipment
- UL 2594 Standard for Safety for Electric Vehicle Supply Equipment
- UL 9741 Outline of Investigation for Bidirectional Electric Vehicle (EV) Charging System Equipment.

⁴ http://standards.sae.org/j3072_201505/

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4. What have the IOUs learned about safety from previously adopted programs, and how should safety guidance be revised for these new programs in this application?

SDG&E's Response: Safety is part of SDG&E's culture and mission statement. SDG&E's goal is to design safety aspects into new VGI / charging programs early in the process. The answers in Question #1 reflect SDG&E's experience in specifying safety standards for the previously-approved VGI / Power Your Drive project, as well as plans to incorporate these safety requirements and criteria into the design of SDG&E's SB 350 proposed projects. SDG&E plans on incorporating lessons learned from VGI / Power Your Drive installations related to safety, technology, and innovation as they roll out into the new proposed SB 350 TE projects as appropriate.

5. What are the relevant safety considerations for the proposed programs? How does the utility assess and rank risks related to TE programs? Can you develop a reasonable worst case scenario as used in RAMP and GRC proceedings and are there specific mitigations that should be considered?

SDG&E's Response:

The relevant safety considerations in the proposed TE programs include:

1. The use of safe equipment with specific safety criteria, such as UL listed charging equipment that complies with the Society of Automotive Engineers J-1722 Standard (electric connector standard for connecting EVSE to cars) as well as compliance with National Electrical Code Article 625 (which covers many safety electrical issues with EV charging stations).
2. Use of installation contractors that are signatory to the IBEW and have the Electric Vehicle Infrastructure Training Program (EVITP) certification. In addition, the installations will be designed in accordance with Article 625 of the National Electrical Code.
3. Safety requirements during charger operations will comply with SAE J-1772 standards for:
 - a. Connector prevents energization of charging cord plug when not connected to vehicle;
 - b. Prevents car from going into "D" (Drive) or "R" (Reverse) when plugged in; and,
 - c. Isolates power from the car when the car charging cord handle button is pressed to disconnect from car

When assessing and ranking risks at the enterprise level, SDG&E follows the risk framework as outlined in SDG&E's S-MAP testimony.⁵ While a formal risk assessment and ranking of risks has not been performed for the proposed TE projects, risk assessments for individual projects typically adhere to a similar S-MAP framework but the focus is more on technical, schedule, and cost risks. However, an

⁵ https://www.sdge.com/sites/default/files/regulatory/LD2D-%23296019-v4-A_15-01-xxx_SDGE_J_DaSilva_Testimony.pdf

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enterprise level safety risk, while not specific to the proposed TE projects, has been identified, analyzed, evaluated and noted in the SDG&E RAMP filing⁶ (RAMP chapter SDG&E-3, Employee, Contractor and Public Safety).

Although a reasonable worst case scenario, similar to those noted in the SDG&E RAMP filing, has not been developed for the proposed TE projects, one could be developed along with associated mitigations.

⁶ https://www.sdge.com/sites/default/files/regulatory/SDGE-3_RAMP_Employee_Contractor_and_Public_Safety_FINAL.pdf