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July 28, 2022

Ms. Liane Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comment on Proposed Advanced Clean Cars II Regulations

Dear Chair Randolph:

ChargePoint thanks the Board and Staff for their work to develop the proposed Advanced Clean Cars II regulations and the opportunity to provide comments on the Notice of Public Availability of Modified Text and Availability of Additional. Documents and Information (15-Day Notice). ChargePoint recommends several modifications to the proposed regulations to align any final regulations. ChargePoint provided comments on the original proposal which have not yet been address, however changes in the 15-day notice raise new concerns and exacerbate ChargePoint's original concerns. ChargePoint seek to ensure that any final regulations adopted by the Board with align with current best and future practices for electric vehicle charging equipment and the safe installation and use of that equipment.

About ChargePoint
Since 2007, ChargePoint has been creating the new fueling network to move all people and goods on electricity. ChargePoint is committed to making it easy for businesses and drivers to go electric, with a world leading electric vehicle (EV) charging network and the most complete set of charging solutions available today. ChargePoint's cloud subscription platform and software-defined charging hardware is designed internally and includes options for every charging scenario from home and multifamily to workplace, parking, hospitality, retail and fleets of all kinds. Currently there are more than 188,000 ports on the ChargePoint network across North America and Europe and an additional 320,000 ports accessible via roaming agreements.

Minimum Technical Requirements for ZEVs - Charging
The Proposal and 15-day notice includes several modifications or additions to the current minimum technical requirements for ZEVs to become effective beginning in model year 2026. The proposed minimum technical requirements require each BEV sold to "be equipped with a 20-foot Underwriter Laboratory (UL) 2594-certifed charging cord capable of both Level 1 and Level 2 electrical charging."[1] New in the 15-day notice is addition related to the Dual Amperage capabilities for AC level 2 charging, see 1962.3 (B)(1) and 1962.3(C) (2).

[1] Initial Statement of Reason at 47

Specifically, the proposed regulations in Subsection 1962.3 read as proposed to be modified in the 15-Day Notice:

(3) Charging Cord. Beginning in the 2026 model year, each vehicle must be supplied with a charging cord that meets the following specifications:

(A) Minimum of 20 feet in length.

(B) Dual amperage capability compatible with AC Level 1 and Level 2 charging:

1. AC Level 1 minimum amperage capability shall be 12 amps.

2. AC Level 2 minimum amperage capability shall be 24 amps or sufficient power to enable charging from a state of discharge to a full charge in less than 4 hours, whichever is lower.

3. The cord shall be configurable by the user, without the use of tools, to facilitate ~~plugging into an appropriate National Electrical Manufacturers Association (NEMA) standard outlet to facilitate~~ a plug connection for Level 1 and Level 2 charging.

(C) User-selectable, without the use of a tool, to downgrade the amperage during charging:

1. For AC Level 1 charging, selectable by the user to charge using 12 amps or 8 amps.

2. If the cord supports amperage at or above 24 amps for AC Level 2 charging, selectable by the user to charge at 24 amps or at 16 amps.

3. The user selection feature must either be integrated into the cord or in the vehicle itself (e.g., via a charging configuration menu or setting in the vehicle).

(D) Tested and listed by a NRTL as meeting requirements for electric vehicle supply equipment contained in Underwriter Laboratory (UL) 2594, "Standard for Electric Vehicle Supply Equipment", December 2016, which is incorporated herein by reference.

ChargePoint agrees with CARB that "[i]ncreasing the ease of home charging is crucial in electrical vehicle uptake and retention" and that access to Level 2 charging at a driver's place of residence and other locations creates a superior driver experience compared to Level 1 charging. However, due to the increased electrical loads on the grid, conflicts with the National Electrical Code (NEC), a wide range of home electrical infrastructure capabilities, and a desire to integrate new EV load with renewables and demand response programs, ChargePoint is concerned that the proposed Subsection 1962.3 if not modified could do more harm than good.

Variable Amperage

While ChargePoint understands the desire to empower consumers to utilize, in a simple way, the electrical infrastructure at their place of residence, ChargePoint is concerned that the specifications of CARB's "charging cord" (or "convenience cord" as described in the Initial Statement of Reason) could put consumers, property, and vehicles at risk. Specifically, the user-selectable ability to adjust the amperage during (and presumably before) charging could be confusing to EV drivers unfamiliar with the electrical system at their place of residence or other location and appears to conflict with provisions of the NEC.

The Purpose and Rational states "by allowing the consumer to select a lower amperage for charging, the need to modify the home's electrical circuit to be compatible with the cord is virtually eliminated."[2] While the need to modify the home's electric circuit may be virtually eliminated, this statement assumes that an average consumer will have enough knowledge of their existing electrical system to choose the appropriate amperage for their situation. ChargePoint is concerned that the average consumer does not

[2] Purpose and Rational, Appendix F-4, at 4.

have the expertise to evaluate the electrical system at their home and choose the appropriate amperage for the charging cord. This problem would be more acute at multi-family residences or other locations where the driver may not have access to the electrical panel to determine the appropriate amperage for the circuit. If the EV driver were to select an improper amperage, damage could be done to the charging cable, electrical infrastructure used by the charging cable, and possibly further upstream in the electrical system.

Subsection 1962.3 of the proposed regulations also violates Article 625.42 of the National Electrical Code (2020).[3] Article 625.42 states (*emphasis added*):

> **Rating**. The power transfer equipment shall have sufficient rating to supply the load served. Electric vehicle charging loads shall be considered to be continuous loads for the purposes of this article. Service and feeder shall be sized in accordance with the product ratings. Where an automatic load management system is used, the maximum equipment load on a service and feeder shall be the maximum load permitted by the automatic load management system.
>
> *Adjustable settings shall be permitted on fixed-in-place equipment only*. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer's instructions, and the adjusted rating shall appear with sufficient durability to withstand the environment involved on the rating label. Electric vehicle supply equipment with restricted access to an ampere adjusting means shall be permitted to have ampere ratings that are equal to the adjusted current setting. Sizing the service and feeder to match the adjusting means shall be permitted. Restricted access shall prevent the user from gaining access to the adjusting means. *Restricted access shall be accomplished by at least one of the following:*
> *(1) A cover or door that requires the use of a tool to open*
> *(2) Locked doors accessible only to qualified personnel*
> *(3) Password protected commissioning software accessible only to qualified personnel*

The proposed charging cord in subsection 1962.3 of the proposal conflicts with two important aspects of the NEC. First, the NEC clearly states that "[a]djustable settings shall be permitted on fixed-in place equipment only." The specifications outlined in subsection 1962.3 are clearly for a mobile charging cord that would violate Article 625.42 of the NEC. Second, the NEC states that adjustable settings must have "restricted access" and "shall be accomplished by at least one of the following: (1) A cover or door that requires the use of a tool to open, (2) Locked door accessible only to qualified personnel, (3) Password protected commission software accessible only to qualified personnel. The specifications in Subsection 1962.3 of the Proposal stating that "the cord shall be configurable by the user, without the use of tools" is in direct conflict with the NEC."

Additionally, according to the near final updates in NEC 625.42(B) and 750.30 (c) for 2023, only EVSEs that have restricted access amperage adjustment means are permitted to be rated according to the adjustable setting. Without meeting the requirement for restricted access, the electrical systems must be sized to accommodate the highest amperage of the EVSE. See sections 625.42 and 750.42 below:

[3] National Electrical Code (NFPA 70), Current Edition (2020), accessed 5/31/2022

625.42 Rating.

The EVSE shall have sufficient rating to supply the load served. Electric vehicle charging loads shall be considered to be continuous loads for the purposes of this article. Service and feeder shall be sized in accordance with the product ratings, unless the overall rating of the installation can be limited through controls as permitted by 625.42(A)~~and~~or (B).

(A) ~~Load~~Energy Management System (EMS).

Where ~~a~~an EMS in accordance with 750.30 provides load management ~~system is used~~of EVSE, the maximum equipment load on a service and feeder shall be the maximum load permitted by the ~~load management system~~EMS. The ~~load management system~~EMS shall be permitted to be integral to one piece of equipment or integral to a listed system consisting of more than one piece of equipment. When one or more pieces of equipment are provided with an integral load management control, the system shall be marked to indicate this control is provided.

(B) EVSE with Adjustable Settings.

~~Adjustable settings~~EVSE with restricted access to an ampere adjusting means complying with 750.30(C) shall be permitted. If adjustments have an impact on the rating label, those changes shall be in accordance with manufacturer's instructions, and the adjusted rating shall appear on the rating label with sufficient durability to withstand the environment involved. ~~Electric vehicle supply equipment~~EVSE~~with restricted access to an ampere adjusting means~~as referenced shall be permitted to have ampere ratings that are equal to the adjusted current setting. ~~Sizing the service and feeder to match the adjusting means shall be permitted. Access to the ampere adjusting means of an EVSE shall be restricted if it is not to be accessed by a user after installation. Such restricted access shall be accomplished by at least one of the following:~~

~~(1) A cover or door that requires the use of a tool to open~~

~~(2) Locked doors accessible only to qualified personnel~~

~~(3) Password protected commissioning software accessible only to qualified personnel~~

~~(4) Commissioning software that defaults to the factory setting after the initial installation setting with the factory setting being the lowest setting in the range~~

750.30 Load Management.

Energy management systems shall be permitted to monitor and control electrical loads ~~unless restricted~~and sources in accordance with 750.30(A) through (C).

(A) Load Shedding Controls.

An energy management system shall not override the load shedding controls put in place to ensure the minimum electrical capacity for the following:

(1) Fire pumps

(2) Emergency systems

(3) Legally required standby systems

(4) Critical operations power systems

(B) Disconnection of Power.

An energy management system shall not ~~be permitted to~~ cause disconnection of power to the following:

(1) Elevators, escalators, moving walks, or stairway lift chairs

(2) Positive mechanical ventilation for hazardous (classified) locations

(3) Ventilation used to exhaust hazardous gas or reclassify an area

(4) Circuits supplying emergency lighting

(5) Essential electrical systems in health care facilities

(C) Capacity of Branch Circuit, Feeder, or Service.

An energy management system shall not cause a branch circuit, feeder, or service to be overloaded ~~at any time~~. If an EMS is used to limit the current on a conductor, 750.30(C)(1) through (C)(4) shall apply:

(1) Current Setpoint.

A single value equal to the maximum ampere setpoint of the EMS shall be permitted for one or more of the following:

(1) For calculating the connected load per 220.70

(2) For the maximum source current permitted by EMS control

(2) System Malfunction.

The EMS shall use monitoring and controls to automatically cease current flow upon malfunction of the EMS.

(3) Settings.

Adjustable settings shall be permitted if access to the settings is accomplished by at least one of the following:

(1) Located behind removable and sealable covers over the adjustment means

(2) Located behind a cover or door that requires the use of a tool to open

(3) Located behind locked doors accessible only to qualified personnel

(4) Password protected with password accessible only to qualified personnel

(5) Software that has password protected access to the adjusting means accessible to qualified personnel only

(4) Marking.

The equipment that supplies the branch circuit, feeder, or service shall be field marked with the following information:

(1) Maximum current setting

(2) Date of calculation and setting

(3) Identification of loads and sources associated with the current limiting feature

(4) The following or equivalent wording: "The setting for the EMS current limiting feature shall not be bypassed"

The markings shall meet the requirements in 110.21(B) and shall be located such that they are clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

Finally, comments in the NEC 2023 update process related to GFCI protection including in625.54 and 210.8 of receptacles for EV charging, consider it a safety risk to plug in and unplug portable EVSE regularly. Mandating portable AC Level 2 EVSE is something they actively discourage due to potential shock risk.

Because the charging cord with variable amperage is in conflict with both the current and future version of NEC, ChargePoint recommends that CARB modify its proposed requirements by removing the user selectable, variable amperage requirements in 1962.3(C).

Consumer Safety

The requirements proposed in Section 3 are in conflict with the intent of several provisions in the NEC and UL that are designed to protect consumer safety and to prevent overloading electrical systems. Provisions such as NEC 625.17(A)(3)(a)(i)&(ii) & (3)(b), 625.17(C), and UL 1.2.a) & b), 6.4.1, 9.2.3, 12.2.1.2.b) are designed to ensure that all installations of higher power EV charging equipment are fastened-in-place (limited to 40 amps) or fixed in place (or hardwired, up to 80 amp). Equipment above 125 v and 16 amps is not permitted to be portable (conflicting with the original and modified 1962.3(C)(2)), it must be fastened in place. Fastened in place is relocatable as opposed to portable, however, it is a safety risk to plug in and unplug portable EVSE regularly. Portable EVSEs are designed for occasional use not for all the charging needs of a vehicle.

Testing to UL 2594 is Not a Substitute for NEC Compliance

ChargePoint appreciates the requirement to have charging equipment tested to UL 2594, however, ChargePoint strongly cautions that testing to UL 2594 is not a substitute to NEC compliance. Testing to UL specifications is focused on the certification of products to specific standards. Certifying that products meet UL 2594 will ensure that the EVSE hardware is safe, but does not ensure proper installation or operational safety. In contrast the National Electrical Code (NEC) are requirements for safe electrical design, installation, and inspection.

Stated simply, the NEC requires that EVSEs to be UL 2594 certified in certain sections (110.2, 110.3(c), 625.5, and Annex A), but UL certification does not require that a product meet NEC requirements. As proposed, the proposal for a user selectable variable amperage charging cord may result in a product that is UL certified, but clearly does not meet the standards for proper installation, use, or operational safety that is required by the NEC.

ChargePoint reiterates its first recommendation that CARB modify its proposed requirement for automakers to provide a “charging cord capable of both Level 1 and Level 2 electrical charging” by removing the Level 2 requirement in 1962.3 (B) and 1962.3 (C).

Level 2 Charging is an Aftermarket Product

ChargePoint believes that automakers, new car dealers, charging providers, and local electrical contractors are in the best position to provide a wide range of charging solutions to meet needs of EV drivers. For their part, automakers and dealers are already providing charging cables as either standard or optional equipment. Use of these charging cables may vary by automaker, make, model, and consumer preference. Allowing EV drivers to match their preferences for charging with the appropriate solution given their unique electrical system should be the primary goal. Mandating a particular style of charging cable to be sold as standard equipment with EVs does not allow for consideration of unique needs of particular EV drivers and does not allow sufficient flexibility to automakers to provide solutions based on use and user feedback. Level 2 charging in particular is better suited as an add-on or aftermarket product that can be tailored to the specific driver's needs.

Charging providers such as ChargePoint are also offering a variety of solutions to meet the needs of EV drivers. Leading charging providers have residential and multifamily charging options that are UL listed, ENERGY STAR certified, and have the ability to be managed to ensure charging benefits the electrical grid. Charging providers are also partnering with automakers to provide easy access to Level 2 charging options for purchasers of new vehicles.[4,5]

Finally, electrical contractors play an important role in ensuring charging takes place in accordance with the NEC and other best practices. While ChargePoint understands the desire to make charging easier for EV drivers, it is critical that CARB understand that each driver's electrical system will have different characteristics and ensuring that charging is done in accordance with the NEC and the manufacturer's guidelines is critical to ensuring that EVs are safely adopted at scale.

ChargePoint recommends that CARB modify its proposed requirement for automakers to provide a "charging cord capable of both Level 1 and Level 2 electrical charging" by removing the Level 2 requirement in 1962.3 (B) and 1962.3 (C) or allow this to be an optional accessory obtained at the point of sale. Focusing on providing access to 110-volt, Level 1 charging as standard equipment will be more cost effective for automakers and consumers. Additionally, automakers, new car dealers, charging providers, and electrical contractors will still be available to assist consumers with the correct Level 2 charger, if desired, to meet their needs and fit their unique electrical system. This sentiment is echoed by Tesla, Auto Innovators Alliance, CalETC, and General Motors with recommendations to either have the CARB regulations focus on L1 charging or make a charging cable optional equipment made available to the customer.

Conclusion

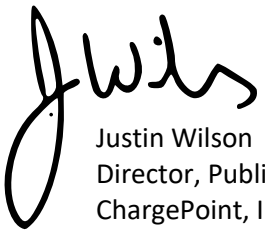
ChargePoint thanks the Board and Staff for the opportunity to make these comments. In summary, ChargePoint recommends that:

- Because the charging cord with variable amperage is in conflict with both the current and future version of NEC, ChargePoint recommends that CARB modify its proposed requirements by removing the user selectable, variable amperage requirements in 1962.3(C).
- ChargePoint recommends that CARB modify its proposed requirement for automakers to provide a "charging cord capable of both Level 1 and Level 2 electrical charging" by removing

[4] Toyota and ChargePoint Enhance EV Driving Experience with Home and Public Charging, accessed 5/31/2022.
[5] ChargePoint and Volvo Cars Team Up to Offer Charging Solutions for US and Canadian Drivers, accessed 5/31/2022

the Level 2 requirement in 1962.3 (B) and 1962.3 (C) or allow this to be an optional accessory obtained at the point of sale as recommended by multiple industry stakeholders.

Sincerely,



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