ARTICLE 625 Electric Vehicle Charging and Supply Equipment Systems

I. General

625.1 Scope.

The provisions of this article cover the electrical conductors and equipment external to an electric vehicle that connect an electric vehicle to a supply of electricity by conductive or inductive means, and the installation of equipment and devices related to electric vehicle charging.

Informational Note No.1: For industrial trucks, see NFPA 505-2011, *Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operation.*


625.2 Definitions.

**Electric Vehicle.** An automotive-type vehicle for on-road use, such as passenger automobiles, buses, trucks, vans, neighborhood electric vehicles, electric motorcycles, and the like, primarily powered by an electric motor that draws current from a rechargeable storage battery, fuel cell, photovoltaic array, or other source of electric current. Plug-in hybrid electric vehicles (PHEV) are considered electric vehicles. For the purpose of this article, off-road, self-propelled electric vehicles, such as industrial trucks, hoists, lifts, transports, golf carts, airline ground support equipment, tractors, boats, and the like, are not included.

Informational Note: For further information, see 625.2648 for interactive systems.

**Electric Vehicle Charging System.** A system of components that provide a dc output that is supplied to the vehicle for the purpose of recharging electric vehicle storage batteries.

**Electric Vehicle Connector.** A device that, by insertion into an electric vehicle inlet, establishes an electrical connection to the electric vehicle for the purpose of power transfer and information exchange. This device is part of the electric vehicle coupler.

Informational Note: For further information, see 625.2648 for interactive systems.

**Electric Vehicle Coupler.** A mating electric vehicle inlet and electric vehicle connector set.

**Electric Vehicle Inlet.** The device on the electric vehicle into which the electric vehicle connector is inserted for power transfer and information exchange. This device is part of the electric vehicle coupler. For the purposes of this *Code,* the electric vehicle inlet is considered to be part of the electric vehicle and not part of the electric vehicle supply equipment.

Informational Note: For further information, see 625.2648 for interactive systems.
Electric Vehicle Nonvented Storage Battery. A hermetically sealed battery, comprised of one or more rechargeable electrochemical cells, that has no provision for the release of excessive gas pressure during normal charging and operation, or for the addition of water or electrolyte, or for external measurements of electrolyte specific gravity.

Electric Vehicle Supply Equipment. The conductors, including the ungrounded, grounded, and equipment grounding conductors and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

Informational Note: For further information, see 625.2648 for interactive systems.

Electric Vehicle Supply Equipment System. A system of components that provide an ac output that is supplied to the vehicle for the purpose of providing input power to an on-board charger.

Personnel Protection System. A system of personnel protection devices and constructional features that when used together provide protection against electric shock of personnel.

Plug-In Hybrid Electric Vehicle (PHEV). A type of electric vehicle intended for on-road use with the ability to store and use off-vehicle electrical energy in the rechargeable energy storage system, and having a second source of motive power.

Rechargeable Energy Storage System. Any power source that has the capability to be charged and discharged.

Informational Note: Batteries, capacitors, and electromechanical flywheels are examples of rechargeable energy storage systems.

625.4 Voltages.

Unless other voltages are specified, the nominal ac system voltages of 120, 120/240, 208Y/120, 240, 480Y/277, 480, 600Y/347, and 600 volts and DC system voltages of up to 600 volts shall be used to supply equipment covered by this article.

625.5 Listed or Labeled.

All electrical materials, devices, fittings, and associated equipment shall be listed or labeled.

II. Wiring Methods—Equipment Construction

625.9 Electric Vehicle Coupler.

The electric vehicle coupler shall comply with 625.910(A) through (F).

(A) Polarization. The electric vehicle coupler shall be polarized unless part of a listed electric vehicle charging system or an electric vehicle supply equipment system identified and listed as suitable for the purpose.
(B) **Noninterchangeability.** The electric vehicle coupler shall have a configuration that is noninterchangeable with wiring devices in other electrical systems. Nongrounding-type electric vehicle couplers shall not be interchangeable with grounding-type electric vehicle couplers.

(C) **Construction and Installation.** The electric vehicle coupler shall be constructed and installed so as to guard against inadvertent contact by persons with parts made live from the electric vehicle supply equipment or the electric vehicle battery.

(D) **Unintentional Disconnection.** The electric vehicle coupler shall be provided with a positive means to prevent unintentional disconnection.

(E) **Grounding Pole**\(^{(6,7)}\). The electric vehicle coupler shall be provided with a grounding pole, unless provided as part of a listed isolated electric vehicle charging system identified and listed as suitable for the purpose in accordance with Article 250.

(F) **Grounding Pole Requirements.** If a grounding pole is provided, the electric vehicle coupler shall be so designed that the grounding pole connection is the first to make and the last to break contact.

625.124 **Rating**\(^{(8)}\).

Electric vehicle supply equipment shall have sufficient rating to supply the load served. For the purposes of this article, electric vehicle charging loads shall be considered to be continuous loads for the purposes of this article. Where an automatic load management system is used, the maximum electric vehicle supply equipment load on a service or feeder shall be the maximum load permitted by the automatic load management system.

625.15 **Markings.**

The electric vehicle supply equipment shall comply with 625.15(A) through (C).

(A) **General.** All electric vehicle supply equipment shall be marked by the manufacturer as follows:

FOR USE WITH ELECTRIC VEHICLES

(B) **Ventilation Not Required.** Where marking is required by 625.29(C), the electric vehicle supply equipment shall be clearly marked by the manufacturer as follows:

VENTILATION NOT REQUIRED

The marking shall be located so as to be clearly visible after installation.

(C) **Ventilation Required.** Where marking is required by 625.29\(^{(DB)}\), the electric vehicle supply equipment shall be clearly marked by the manufacturer, “Ventilation Required.” The marking shall be located so as to be clearly visible after installation.

625.16 **Means of Coupling.**

The means of coupling to the electric vehicle shall be either conductive or inductive. Attachment plugs, electric vehicle connectors, and electric vehicle inlets shall be listed or labeled for the purpose.
625.17 Cords and Cables.

(A) Power Supply Cord. The cable for cord-connected equipment shall comply with all of the following:

(1) Be any of the types specified in (B)(1) or Hard Service Cord, Junior Hard Service Cord and Portable Power Cable types in accordance with Table 400.4. Hard Service Cord, Junior Hard Service Cord and Portable Power Cable types shall be listed, as applicable, for exposure to oil and damp and wet locations.

Exception: A power supply cord that is listed as a part of the electric vehicle supply equipment or electric vehicle charging system.

(2) Have an ampacity as specified in Table 400.5(A)(1) or, for 8 AWG and larger, in the 60 C columns of Table 400.5(A)(2).

(3) Have an overall length as specified in (a) or (b):

   (a) When the interrupting device of the personnel protection system specified in 625.22 is located within the enclosure of the supply equipment or charging system, the power supply cord shall be no more than 300 mm (12 in.) long.

   (b) When the interrupting device of the personnel protection system specified in 625.22 is located at the attachment plug, or within the first 300 mm (12 in.) of the power supply cord, the overall cord length shall be a minimum of 1.8 m (6 ft) and shall be no greater than 4.6 m (15 ft).

(B) Output Cable to the Electric Vehicle. The output cable to the electric vehicle shall comply with all of the following:

(1) Be Type EV, EVJ, EVE, EVJE, EVT, or EVJT flexible cable as specified in Table 400.4.

(2) Have an ampacity as specified in Table 400.5(A)(1) or, for 8 AWG and larger, in the 60 C columns of Table 400.5(A)(2).

Exception to (2): An output cable to the electric vehicle that is listed as a part of the electric vehicle supply equipment or electric vehicle charging system.

Informational Note: Listed electric vehicle supply equipment or electric vehicle charging system may incorporate output cables having ampacities greater than 60C based on the permissible temperature limits for the components and the cable.

(C) Overall Cord and Cable Length. The overall useable length shall not exceed 7.5 m (25 ft) unless equipped with a cable management system that is part of a listed the electric vehicle supply equipment or electric vehicle charging system.
(1) Where the electric vehicle supply equipment or charging system is not fixed in place, the cord exposed useable length shall be measured from the face of the attachment plug to the face of the electric vehicle connector.

(2) Where the electric vehicle supply equipment or charging system is fixed in place, the useable length of the output cable shall be measured from the cable exit of the electric vehicle supply equipment or charging system to the face of the electric vehicle connector. Other cable types and assemblies listed as being suitable for the purpose, including optional hybrid communications, signal, and composite optical fiber cables, shall be permitted.

625.18 Interlock.

Electric vehicle supply equipment shall be provided with an interlock that de-energizes the electric vehicle connector and its cable whenever the electrical connector is uncoupled from the electric vehicle. An interlock shall not be required for portable cord-and-plug-connected electric vehicle supply equipment intended for connection to receptacle outlets rated at 125 volts, single phase, 15 and 20 amperes.

625.19 Automatic De-Energization of Cable.

The electric vehicle supply equipment or the cable-connector combination of the equipment shall be provided with an automatic means to de-energize the cable conductors and electric vehicle connector upon exposure to strain that could result in either cable rupture or separation of the cable from the electric connector and exposure of live parts. Automatic means to de-energize the cable conductors and electric vehicle connector shall not be required for portable cord-and-plug-connected electric vehicle supply equipment intended for connection to receptacle outlets rated at 125 volts, single phase, 15 and 20 amperes.

625.22 Personnel Protection System.

The electric vehicle supply equipment shall have a listed system of protection against electric shock of personnel. The personnel protection system shall be composed of listed personnel protection devices and constructional features. Where cord-and-plug-connected electric vehicle supply equipment is used, the interrupting device of a listed personnel protection system shall be provided and shall be an integral part of the attachment plug or shall be located in the power supply cable not more than 300 mm (12 in.) from the attachment plug.

III. Equipment Construction-Installation

(12) 625.30 Branch Circuit Markings.

When a branch circuit is installed to supply electric vehicle supply equipment (or electric vehicle charging system), a label shall be permanently affixed adjacent to the outlet box and shall contain the following information: “For use with electric vehicle supply equipment (or electric vehicle charging system)”, as appropriate, and the voltage and amperage it is permitted to serve.

625.2140 Overcurrent Protection.

Overcurrent protection for feeders and branch circuits supplying electric vehicle supply equipment shall be sized for continuous duty and shall have a rating of not less than 125 percent
of the maximum load of the electric vehicle supply equipment. Where noncontinuous loads are supplied from the same feeder or branch circuit, the overcurrent device shall have a rating of not less than the sum of the noncontinuous loads plus 125 percent of the continuous loads.

625.2342 Disconnecting Means.

For electric vehicle supply equipment rated more than 60 amperes or more than 150 volts to ground, the disconnecting means shall be provided and installed in a readily accessible location. The disconnecting means shall be capable of being locked in the open position. The provision for locking or adding a lock to the disconnecting means shall be installed on or at the switch or circuit breaker used as the disconnecting means and shall remain in place with or without the lock installed. Portable means for adding a lock to the switch or circuit breaker shall not be permitted.

(16) 625.1344 Electric Vehicle Supply Equipment Connection.

Electric vehicle supply equipment shall be permitted to be cord and plug connected to the premises wiring system in accordance with one of the following:

(A) Electric vehicle supply equipment intended for connection to receptacle outlets rated at 125 volts, single phase, 15 and 20 amperes.

(B) Electric vehicle supply equipment that is rated 250 volts maximum and complies with all of the following:

   (1) It is installed indoors and or part of a system identified and listed as suitable for the purpose and meeting the requirements of 625.18, 625.19, and 625.50 and 625.52 shall be permitted to be cord and plug connected.

   (2) It is intended for connection to receptacle outlets rated no more than 50 amperes.

   (3) It is installed to facilitate any of the following:
       a. Ready removal for interchange
       b. Facilitate maintenance and repair
       c. Repositioning of Portable, movable, or EVSE fastened in place

   (4) Power supply cord length for electric vehicle supply equipment fastened in place is limited to 6 ft (1.8 m).

   (5) Receptacles are located to avoid physical damage to the flexible cord.

All other electric vehicle supply equipment shall be permanently connected to the premises wiring system and fastened in place. The electric vehicle supply equipment shall have no exposed live parts.

IV. Control and Protection

625.2546 Loss of Primary Source.

Means shall be provided such that, upon loss of voltage from the utility or other electrical system(s), energy cannot be back fed through the electric vehicle and the supply equipment to the premises wiring system unless permitted by 625.2648.

625.2648 Interactive Systems.
Electric vehicle supply equipment and other parts of a system, either on-board or off-board the vehicle, that are identified for and intended to be interconnected to a vehicle and also serve as an optional standby system or an electric power production source or provide for bi-directional power feed shall be listed and marked as suitable for that purpose. When used as an optional standby system, the requirements of Article 702 shall apply, and when used as an electric power production source, the requirements of Article 705 shall apply.

V. Electric Vehicle Supply Equipment Locations

625.29 (Indoor Sites Location)

Indoor sites shall include, but not be limited to, integral, attached, and detached residential garages; enclosed and underground parking structures; repair and nonrepair commercial garages; and agricultural buildings.

(A) Location. The electric vehicle supply equipment shall be located to permit direct connection to the electric vehicle.

(B) Height. Unless specifically listed for the purpose and marked for the location, the coupling means of the electric vehicle supply equipment shall be stored or located at a height of not less than 450 mm (18 in.) and not more than 1.2 m (4 ft) above the floor level for indoor locations and 600 mm (24 in.) above the grade level for outdoor locations.

625.30 (Outdoor Sites, Ventilation)

Outdoor sites shall include but not be limited to residential carports and driveways, curbside, open parking structures, parking lots, and commercial charging facilities.

(A) Location. The electric vehicle supply equipment shall be located to permit direct connection to the electric vehicle.

(B) Height. Unless specifically listed for the purpose and location, the coupling means of electric vehicle supply equipment shall be stored or located at a height of not less than 600 mm (24 in.) and not more than 1.2 m (4 ft) above the parking surface.

The ventilation requirement for charging an electric vehicle in an indoor enclosed space shall be determined by one of the following:

(CA) Ventilation Not Required. Where electric vehicle nonvented storage batteries are used or where the electric vehicle charging system or electric vehicle supply equipment system is listed or labeled as suitable for charging electric vehicles indoors without ventilation and marked in accordance with 625.15(B), mechanical ventilation shall not be required.

(DB) Ventilation Required. Where the electric vehicle charging system or electric vehicle supply equipment system is listed or labeled as suitable for charging electric vehicles that require ventilation for indoor charging, and is marked in accordance with 625.15(C), mechanical ventilation, such as a fan, shall be provided. The ventilation shall include both supply and exhaust equipment and shall be permanently installed and located to intake from, and vent directly to, the outdoors. Positive pressure ventilation systems shall be permitted only in vehicle charging buildings or areas that have been specifically designed and approved for that
application. Mechanical ventilation requirements shall be determined by one of the methods specified in 625.2952(DB)(1) through (DB)(4).

(1) **Table Values.** For supply voltages and currents specified in Table 625.2952(DB)(1) or Table 625.2952(DB)(2), the minimum ventilation requirements shall be as specified in Table 625.2952(DB)(1) or Table 625.2952(DB)(2) for each of the total number of electric vehicles that can be charged at one time.

(2) **Other Values.** For supply voltages and currents other than specified in Table 625.2952(DB)(1) or Table 625.2952(DB)(2), the minimum ventilation requirements shall be calculated by means of the following general formulas, as applicable:

(1) **Single phase:**

\[
\text{Ventilation}_{\text{single phase}} \text{ in cubic meters per minute (m}^3\text{/min)} = \frac{\text{(volts})(\text{amperes})}{1718}
\]

\[
\text{Ventilation}_{\text{single phase}} \text{ in cubic feet per minute (cfm)} = \frac{\text{(volts})(\text{amperes})}{48.7}
\]

(2) **Three phase:**

\[
\text{Ventilation}_{\text{three phase}} \text{ in cubic meters per minute (m}^3\text{/min)} = \frac{1.732(\text{volts})(\text{amperes})}{1718}
\]

\[
\text{Ventilation}_{\text{three phase}} \text{ in cubic feet per minute (cfm)} = \frac{1.732(\text{volts})(\text{amperes})}{48.7}
\]

(3) **Engineered Systems.** For an electric vehicle supply equipment ventilation system designed by a person qualified to perform such calculations as an integral part of a building’s total ventilation system, the minimum ventilation requirements shall be permitted to be determined in accordance with calculations specified in the engineering study.

(4) **Supply Circuits.** The supply circuit to the mechanical ventilation equipment shall be electrically interlocked with the electric vehicle supply equipment and shall remain energized during the entire electric vehicle charging cycle. Electric vehicle supply equipment shall be marked in accordance with 625.15. Electric vehicle supply equipment receptacles rated at 125 volts, single phase, 15 and 20 amperes shall be marked in accordance with 625.15(C)30 and shall be switched, and the mechanical ventilation system shall be electrically interlocked through the switch supply power to the receptacle.
Table 625.2952(DB)(1) Minimum Ventilation Required in Cubic Meters per Minute (m³/min) for Each of the Total Number of Electric Vehicles That Can Be Charged at One Time

<table>
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<th>Branch-Circuit Ampere Rating</th>
<th>Single Phase</th>
<th>240 V or 120/240 V</th>
<th>208 V or 208Y/120 V</th>
<th>240 V</th>
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Table 625.2952(DB)(2) Minimum Ventilation Required in Cubic Feet per Minute (cfm) for Each of the Total Number of Electric Vehicles That Can Be Charged at One Time

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(14) **625.28 Hazardous (Classified) Locations.**

Where electric vehicle supply equipment or wiring is installed in a hazardous (classified) location, the requirements of Articles 500 through 516 shall apply.
Article 625 Reformatting

Substantiation

This proposal was developed by the Code-Making Panel 12 Task Group on Electric Vehicles. Task group members were as follows: Gery J. Kissel, Chair, General Motors Corporation; Thomas R. Brown, Intertek Testing Services; Tomas L. Hedges, Hedges Electric & Construction, Inc.; Jeffrey L. Holmes, IBEW Local Union 1 JATC; Todd Lottmann, Cooper Bussmann; Jose Salazar, Southern California Edison; David Sher, City of Bellevue, WA; Lori Tennant, Square D Company/Schneider; John R. Kovacik, Underwriters Laboratories, Gregory C. Nieminski, Gregory C. Nieminski, LLC; Jeffrey S. Menig, General Motors Corporation, and Jason France, ClipperCreek, Inc.

Significant technical contributions were provided by the following guests of the Task Group: Alan Manche of Schneider Electric, Brian Rock of Hubbell Inc, and Frank Tse of Leviton.

The title for the various parts of Article 625 do not fit the requirements found within those parts and needs to be revised in order to enhance the understanding of this article.

Part II titled Wiring Method is not a building wiring method, it is a cord connection to the car from the supply equipment that is covered by the construction of the equipment. Therefore it should be moved to the Equipment Construction part.

Many articles in the NEC have an installation part to guide the user on field installation requirements. Article 625 has installation requirements scatter throughout the article even under parts that are found in the construction part however the primary installation requirements currently reside in NEC 625.21 through 625.30.

For convenience, below is a mapping of paragraphs between the 2011 NEC and the proposed restructure.

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Additional Substantiations

1. The added Informational Note will direct Code users to standards that serve as the basis for certification requirements for products covered by this Article which are required to be listed. As UL Standards 2594 and 2202 are used for product listing required by the Code, it is proposed for inclusion in Annex A.

2. New definition for Electric Vehicle Charging System

3. New definition for Electric Vehicle Supply Equipment System

4. Photovoltaic arrays, battery banks, and other DC supply sources are already being used to supply equipment covered by this article.

5. Labeling of electric vehicle equipment is not appropriate. The intent of including labeling was to cover field evaluation of unlisted equipment. This is not possible as such equipment requires considerable testing to verify proper operation and this testing is impractical at the installation site.

6. “Suitable for the purpose” is vague and unenforceable. Electric vehicle equipment covered by this Article may consist of a charging system as well as a supply equipment system. The substituted text clarifies how compliance is to be achieved. “Identified” has been deleted as it is considered redundant.

7. Substitute text describes when a grounding pole is needed or not.

8. As submitted with TIA 1038:
   The NEC must recognize technology that will support the rollout of EVs. Existing infrastructure and regulations can place constraints on where EV will functionally be permitted. The NEC has the opportunity to enhance the roll out of EVs by recognizing and permitting technology that can open the market for the use of EVs without compromising safety.

   NEC 625.14 requires electric vehicle supply equipment be considered a continuous load. This means that the EV charging load must be added at 125% of the full load charging capability of the electric vehicle supply equipment. The addition of this load to an existing electrical service will likely result in the service being too small based on NEC calculations, to handle the EV charging. Revisions are needed to specifically recognize energy management as one of the ways to overcome the calculated load issues. The NEC has no provision for shedding loads to offset the electric vehicle supply equipment load, nor is there a provision that would allow the EV charger to reduce the charging load in real time to ensure that the total home or building load was within the rating of the involved equipment. Such permission in the NEC would enable “smart” EVSE or an energy management system to address situations where an infrastructure upgrade might be necessary otherwise the electric vehicle is potentially left sitting on the dealer’s lot.
9. This proposal is to provide greater clarification regarding plug- and cord-connection and the output cable to the EV where confusion of interpretation presently exists.

Requirements for power supply cord from UL 2594 have been added.

The requirements for the power supply cord and output cable to the electric vehicle have been arranged in a list format.

The reference to Article 400 for the output cable to the electric vehicle is deleted in accordance with the NEC Style Manual 4.1.1.

“Suitable for the purpose” associated with a cable management system is vague and unenforceable. The substituted text clarifies how compliance is to be achieved.

The reference to other cable types is deleted as these cable types (optional hybrid communications, signal, and composite optical fiber cables) are now available as EV cables making it unnecessary to specify a permission to use them.

The exception for output cable to the electric vehicle is intended to allow ampacities greater than 60C based on listing evaluation and the permissible temperature limits for the components in the cable.

10. “Identified for and” has been deleted as it is considered redundant since all equipment is required to be listed. A marking requirement has been added to clarify how suitability is to be determined for equipment to serve as an optional standby system, an electric power production source or being able to provide for bi-directional power feed.

11. Not used.

12. Branch Circuits are being installed in facilities to establish EV ready electrical installations. This revision ensures those outlets are identified.

13. The basic location requirements are the same for both indoor and outdoor, therefore this proposal seeks to delete section 625.30 and rename Section 625.29 to 625.50 “Location.” The ventilation requirements are proposed to be placed in its own section to specifically address ventilation. The laundry list of locations in the indoor and outdoor sections that are proposed for deletion are addressed by the new language in 625.52 “in an indoor enclosed space.”

4 foot height was removed as this is an ADA driven requirement.

The two sections that currently reside in the “Indoor location” section addressing ventilation have now been moved to a specific section titled 625.52 Ventilation.

Concerns over the word “nonvented” creates issues for batteries that are designed not to vent during normal charging and operation, however there may be a “vent” located in a battery for another reasons such as cooling or other safety reasons that do not expel gas that could placed the user in harm’s way due to lack of ventilation.

The table references have been revised to align with the new paragraph for ventilation.
14. All of the provisions of Articles 500 through 516 may not apply to electric vehicle supply equipment.

15. References to entire Articles of the NEC would be a violation of the NEC Style Manual (4.1.1).

16. As submitted with TIA 1037:
   The introduction of commercially available electric vehicles from major automobile manufacturers has accelerated the deployment of electric vehicle infrastructure. With the electrification of vehicles being a national initiative, it is imperative that the NEC keep up with the latest technology and clearly address the electrical safety requirements in order to facilitate the safe, efficient, and reliable installation of electric vehicle infrastructure across the country. The National Electrical Code serves a key role in the national deployment of electric vehicles. Safety is the paramount goal of the NEC, but it also serves a much more significant role than at first glance. The NEC retains its fundamental principle of safeguarding persons and property from hazards arising from the use of electricity through clear, concise, and enforceable language across all jurisdictions. At the center of this mission is ensuring that the rules are clear so communities can easily and consistently enforce the same requirements across jurisdictions. The electrical infrastructure for EVs must be uniform for users and installers across the country.

NEC 625.13 is currently being interpreted differently by the electrical industry and by electrical inspectors across the country. Even a review of the NEC archives on this topic presents a quandary of how it should be interpreted. When the original language went into the NEC in 1999, the permitted cord and plug connection is documented as being for “portable” electric vehicle supply equipment (EVSE) equipment. Because of a response to a particular comment in the 2011 NEC cycle, it appears to some that the NEC committee may have taken a different view, but the language remained unchanged in the Code. In order to address the acceptance of cord and plug connected EVSE, the 2011 NEC is in need of revision to ensure it is enforced the same from city to city and state to state. Having cord and plug connected EVSE accepted in some states and not in others is an unnecessary speed bump for rolling out EVs and will cause confusion among automobile dealers trying to help customers purchase EVs along with the appropriate charging equipment.

The language in NEC 625.13 can be interpreted incorrectly to prohibit cord and plug connection of EVSE rated at 250V. Jurisdictions that interpret the current NEC 625.13 to prohibit cord and plug connection for EVSE will place an undue hardship on the owners or potential owners of electric vehicles, electrical contractors, and electrical distributors.

625.13(A) The section has been restructured to ensure clear and enforceability language for cord and plug connected EVSE. Item (A) addresses 125V charging and item (B) addresses 250V charging. The present language permits a 125V, 20A rated EVSE. The language is being change to align with the receptacle outlet ratings of 15 and 20A in NEC 625.18 and .19.

625.13(B) There are no voltage or amperage restrictions on cord and plug connected EVSE rated over 125V, permitting up to 600V and unlimited amperage, which creates a public safety concern for vehicle charging. Plug and cord connected equipment for
public interaction is typically limited to 250V with a 50A receptacle for appliances such as ranges. Extending cord and plug connection beyond this voltage and amperage for the general public and in residential applications establishes a safety concern.

625.13(B)(2) Since the electric vehicle charging load is considered continuous in NEC 625.14, the maximum rated EVSE that could be installed on a 50A circuit is 40A rated equipment. Therefore, this proposal restricts plug and cord connection of EVSE to a receptacle outlet rated no more than 50A at 250V.

625.13(B)(3) Confusion around the enforcement of the current language could also drive inconsistent permission in the utilization of cord as a substitute for fixed a wiring system. Without clarification, NEC 400.7 can be cited to completely prohibit the use of cord connected EVSE. The introduction of 625.13(B)(3) addresses this acceptance concern.

625.13(B)(4) & (5) There currently is no restriction to limit the length of the cord supplying the EVSE. Permitting cord lengths longer than 6 ft opens the opportunity for damage to the cord and provides justification for the inspector to utilize NEC 400.8 as a means to prohibit the use of the cord. The personnel protection system that is required is not a substitute to permit an unlimited cord supply in place of a permanent wiring method. A number of sections in the NEC address cord length restrictions and receptacle location.

- NEC 422.16 establishes cord lengths based on the appliance for frequent interchange that vary from 18 in. to 4 ft.
- NEC 422.16 also requires the receptacle to be located to avoid physical damage to the flexible cord.
- NEC 210.50 also provides guidance on the 6 ft restriction because it requires an appliance receptacle to be located within 6 ft of its intended location.
- The 6 ft length restriction also aligns with the permitted length of traveler cable in NEC 620.44(b) to be used beyond a fixed point on the car or hoist way car where a permanent wiring method could then be used. Therefore, the proposed text restricts the supply cord to 6 ft and provides enforceable language to ensure the receptacle is located to further avoid physical damage to the EVSE supply cord.