ANSI WORKSHOP
Standards and Codes for
Electric Drive Vehicles

ANSI
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Potential NEC Article 625 Issues

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NEMA

- Who is NEMA? National Electrical Manufacturers Association
- NEMA is the trade association of choice for the electrical manufacturing industry. Founded in 1926 and headquartered near Washington, D.C., its approximately 450 member companies manufacture products used in the generation, transmission and distribution, control, and end-use of electricity.

NEMA EVSE Section

- Electric Vehicle Supply Equipment Section
  - Purpose
    - Support the development of the electric vehicle supply equipment market
    - Educate the market on the features and value of the electric vehicle supply equipment infrastructure around the world
    - Develop, in association with other related NEMA sections, the technology and application and product standards.

EVSE Section Members

- Cooper
- Coulomb
- Eaton
- GE
- Hubbell
- Legrand
- Leviton
- Milbank
- Panasonic
- Schneider
- Siemens
- Southwire

Today's Topics

- Potential NEC article 625 issues:
  - listing and minimum enclosure rating requirements;
  - electric vehicle supply equipment (EVSE) to building power connectivity for Level 2 and up;
  - EVSE portability;
  - branch protection and building wiring minimum sizing;
  - EVSE charging cord topics;
  - safety of chargers, plug-in connection,
  - EVSE's personnel protection, and equipment

Listing and Minimum Enclosure Requirements

- NEC
  - 625.13-Shall have not exposed live parts
- UL 2594
  - 6.2.2-enclosure shall house all hazardous live parts….protect against mechanical damage
  - 7.1-7.7-details the frame and enclosure
  - 7.7.1- the enclosure rating shall be appropriate for the intended conditions of use.
- Should there be a minimum rating such as Nema 4, watertight?

EVSE to Building Power Connectivity

- NEC art 625.13- EVSE rated at 125 volts, single phase, 15 or 20 amperes or part of a system identified and listed as suitable for the purpose and meeting the requirements of 625.18, 625.19, and 625.29 shall be permitted to be cord-and –plug-connected. All other EVSE shall be permanently connected and fastened in place.
- Level 2 and up
  - Level 2 is clearly permitted to be cord-and-plug-connected if it meets the requirements above.

Overcurrent Protection

- branch protection and building wiring minimum sizing
  - 625.21-overcurrent protection for feeders and branch circuits supplying EVSE shall be sized for continuous duty and shall have a rating of not less than 125% of the maximum load of the EVSE

Safety of Chargers

- NEC 625.18- Interlock
  - De-energizes the EVSE connector and cable when uncoupled form the vehicle
- NEC 625.19-Automatic De-Energization of Cable
  - De-energizes the connector and cable when exposed to strain that could rupture of separate the cable from the connector and expose live parts.
- NEC 625.29(D)-Ventilation interlock
  - Prevents a vehicle requiring ventilation from being charged unless ventilation is provided

Personnel Protection

- NEC
  - Shall have a listed system of protection against electric shock of personnel
- UL 2594
  - 9.2-Personal Protection System
    - Requires personnel protection system
    - Requires system to be protected by enclosure
    - Requires interrupting device to be located as either an integral part of the attachment plug or located in the power supply cord not more than 12 inches form the plug

Additional Thoughts

- What issues need to be addressed?
- Does the existing section in the NEC sufficiently cover the issues?
- Should we address what EVSE ready means?