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Addressing EVSE Maintenance and Repair Training Programs and Cautioning Public Institutions

Director Pereira,

I am writing on behalf of the California State Association of Electrical Workers (CSAEW) to express our concern about proposals to have the California Community Colleges, Workforce Development Boards, or other public agencies or organizations fund or directly offer limited Electric Vehicle Supply Equipment ("EVSE") maintenance and repair training programs for non-electrician "technicians." There are a number of these short-term, limited technician training programs operating, including ChargerHelp! and SmartHelp. These programs are generally just several weeks long and do not publish any verified job placement rates. Furthermore, the limited scope and applicability of training programs in this category raise significant electrical safety concerns and are unlikely to produce meaningful employment or career opportunities. Before any public educational or workforce facilitation dollars are committed to these programs, the concerns raised in this letter should be carefully assessed.

The CSAEW's concerns center on six related areas:

1) EVSE maintenance and repair companies are required by law to hold C-10 Contractor licenses and to use state-certified electricians to perform any electrical work.

2) ChargerHelp!, SmartHelp, and other limited "technician" training programs are marketed to non-electricians and thus their graduates are legally and practically restricted to a very narrow scope of work that EVSE maintenance and repair companies perform: essentially visual and computer diagnostics and programming, cleaning and reporting.

3) The narrow scope of non-electrical work that these graduates can perform is rapidly declining as new EVSE units provide remote diagnostic capabilities that largely eliminate the need to send non-electricians out in the field to make initial assessments.

4) ChargerHelp!, SmartHelp, and other similar "technician" training programs do not publish California job placement rates and likely achieve little success in providing graduates with meaningful employment because of the narrow scope of work these graduates can perform.

5) Trainees and graduates of these programs that are informed or misled into believing they have the skills and training necessary to safely shut off electricity and open EVSE enclosures or electrical equipment rooms may be exposed to significant electrical hazards that could cause serious injury or death.

6) If these programs misrepresent to their graduates that these programs qualify them to perform electrical work on EVSE, substantial liability could result if a graduate suffers injury from electrical hazards. Community colleges, workforce boards, and other training facilitators that offer, participate in, or fund these programs could be named in lawsuits over such injuries resulting in substantial legal costs and potential joint liability claims.

While much attention has been focused on the "need" for a higher level of EVSE up-time, this does not mean that every proposed EVSE maintenance and repair program is worthy of a commitment of public educational or workforce support dollars. Unfortunately, opportunistic new educational providers often pop up to take advantage of perceived education gaps with little care to ensure educational opportunities are of the scope and quality needed to provide safe and effective training and to create meaningful job career opportunities.

The most obvious limitation of EVSE non-electrician maintenance and repair technician programs is that they are training non-electricians to perform work that primarily requires holding an electrician certification from the State of California. California requires entities contracting to perform maintenance, repair, or installation of Electric Vehicle Supply Equipment ("EVSE") to hold a valid C-10 Electrical Contractor License issued by the California Contractors State License Board.[1] Furthermore, C-10 contractors are required by state law to employ state-certified electricians to carry out any electrical work on such systems. *(The specific California State contractor and electrician regulations and requirements are further detailed in the attached addendum.)*

These limited EVSE non-electrician maintenance and repair technician programs do not provide the training necessary to qualify an individual as a state-certified electrician. Graduates of such programs are not permitted to perform electrical work for EVSE maintenance and repair companies without thousands of hours of additional on-the-job training and state certification. It is important to note that even a 300-hour electrical course provides less than five percent of what is needed. The State of California requires 8,000 hours of hands-on electrical construction experience to be eligible to take the state general electrician exam.[2]

It is also important to note that there is no California State definition or recognition of an "electrical technician." Organizations or individuals who use the term "technician" in association with line voltage electrical work are either uninformed or supportive of training that falls short of State of California requirements and puts workers and the public at risk.

Graduates of these limited "EVSE technician" training programs that are non-electricians are legally and practically restricted to a very narrow scope of work that EVSE maintenance and repair companies perform: non-electrical tasks such as visual inspection without opening any EVSE enclosures or electrical equipment rooms, addressing software and payment system faults, performing software resets, cleaning exterior surfaces, reporting out-of-order units, and

[1] Contractors State License Board, Licensing Classifications: C-10 – Electrical <https://www.cslb.ca.gov/about_us/library/licensing_classifications/c-10_-_electrical.aspx>, citing Cal. Code Regs., tit. 16, div. 8, art. 3.

[2] Department of Industrial Relations, Division of Labor Standards Enforcement, General Electrician Experience Requirements <https://www.dir.ca.gov/dlse/ecu/1a.html>; see also Cal. Code Regs., tit. 8, § 291.1.

deploying signage, cones, or caution tape where warranted. In practice, this means that graduates are limited to rebooting display screens, noting obvious damage, and calling in a licensed electrician to make equipment repairs.

Furthermore, EVSE manufacturers and networking companies are integrating remote software communication capabilities into an increasing number of commercial EVSE units. Every year these companies are able to perform more and more payment function resets and other software operations remotely from their offices without an in-person site visit. Much of this remote work will likely soon be performed automatically by AI. Hence, the minimal scope of work that is even currently available for a graduate of EVSE non-electrician maintenance and repair technician programs is becoming even more limited. **With on-site reprogramming declining, the essential question here is whether EVSE exterior cleaning, placing cones, caution tape and signage, and reporting out-of-order equipment constitutes a job.** This is likely the main reason why accurate reports of job-placement rates in California for these limited EVSE non-electrician maintenance and repair technician programs are non-existent.

The contrast between what graduates of a short-term limited EVSE non-electrician maintenance and repair technician program can legally do and what genuine EVSE maintenance requires is stark. There is a wide range of causes for EV charging stations to go out of service, including loss of power, faulty connectors or cables, internal component failure, ground faults, disconnected wiring, vandalism, blown fuses, and network communication issues. With the exception of software issues, diagnosing and resolving most of these problems requires electrical knowledge, skill, and licensure that graduates of EVSE non-electrician maintenance and repair technician programs do not possess.

Any work beyond that narrow scope requires that the power first be shut off, which itself demands the knowledge, skill, and safety protocol expertise of a qualified electrician. Testing, metering, and repairing internal wiring and components requires opening the EVSE enclosure, which only a licensed electrician may do for an EVSE repair and maintenance company, which must hold a C-10 license. Level 2 EVSE operate at 208/240 volts, while Direct Current Fast Chargers (DCFC) and industrial units operate from 480 volts up to and exceeding 1,000 volts[3], making service of the equipment an extremely serious safety matter.

The emergence of 800 Volt EV architecture in new electrical vehicles means that new EVSEs will increasingly qualify as high voltage equipment that is subject to additional restrictions on who can install, repair and maintain them. The Department of Industrial Relations High Voltage Electrical Safety Order states that only "qualified electrical workers" can work on these systems.[4] The Order goes on to define "qualified electrical worker" as having "a minimum of two years of training and experience with high-voltage circuits and equipment and who has demonstrated by performance familiarity with the work to be performed and the hazards involved." **This is in addition to the state certified electrician requirement that applies to work on all EVSEs.**

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[3] U.S. Dept. of Transportation, Charger Types and Speeds (https://www.transportation.gov/rural/ev/toolkit/ev-basics/charging-speeds) (Level 2 equipment operates at 208 or 240 volts); NFPA 70, National Electrical Code, art. 625 (covering nominal EVSE system voltages up to 1,000 volts AC and DC); Iso Electronics Tutorials, DC Fast Chargers and Level 3 High-Speed Charging For EVs (https://www.electronics-tutorials.ws/power/dc-fast-chargers.html) (noting some DC fast chargers now charge at voltages up to or above 1,000 VDC).

[4] Cal. Code Regs., tit. 8, § 2940, subdivision (c).

The restrictions on who can perform work on EVSEs exist not just to protect customers, but also to protect the workers themselves. **Arc flash and arc blast hazards exist across all commercial EVSE types.** An electrical arc flash is one of the most dangerous hazards in electrical work, occurring when a high-current electrical discharge jumps

through the air between conductors or from a conductor to ground, releasing an explosive burst of energy. The temperatures generated during an arc flash can exceed 35,000°F (19,400°C) — roughly four times hotter than the surface of the sun[5] — instantly vaporizing metal components and causing severe, often fatal burns to anyone in the vicinity, even at a distance. Beyond the extreme heat, an arc flash produces a powerful pressure wave (arc blast) capable of throwing workers off their feet, rupturing eardrums, collapsing lungs and propelling molten metal droplets and shrapnel at high velocity; it also generates intense light capable of causing eye damage, toxic gases from vaporized materials, and a deafening sound blast exceeding 140 decibels.[6]

Because these events happen in milliseconds and can be triggered by something as simple as a dropped tool, accumulated dust, equipment failure, or human error, arc flash incidents are treated as extreme hazards requiring rigorous risk assessments, proper personal protective equipment (PPE) rated for the specific incident energy level, de-energization procedures, and strict adherence to electrical safety standards such as NFPA 70E. State certified general electricians are trained and tested to understand and protect themselves and others from extreme electrical hazards. Whether it is powering level 2 chargers or DCFCs, no one else should work in an electrical room or cabinet. For video descriptions of the extreme danger and consequences of arc flash and arc blast, see these:

https://www.youtube.com/watch?v=6hpE5LYj-CY

https://www.youtube.com/watch?v=xDLKLnVdlWE

If a program expressly or tacitly allows its graduates to believe they are qualified to perform electrical work on EVSE, that false confidence may result in serious injury or death that would pose a significant risk of liability to that program. Any community college, workforce board, or other institution that sponsors, participates in, or funds such a program could also be drawn into the resulting litigation, exposing it to substantial legal expense and the risk of joint liability.

Even beyond safety concerns, it is unlikely that these programs will result in meaningful job prospects for graduates. The CSAEW has been unable to locate evidence that these programs result in any meaningful job placement or job retention rates for graduates in California, which is not surprising given how little graduates are legally and safely able to do. This underscores the need for the community colleges, workforce development boards, and other facilitating organizations and institutions to determine the actual history of California employment from these types of EVSE maintenance and repair technician training programs. These programs should be required to provide verified evidence of outcomes in job placement, duration, and pay.

[5] See, e.g., Fluke Corporation, What Causes Arc Flash? Electrical Arc Blast Explained (https://www.fluke.com/en-us/learn/blog/safety/arc-flash-vs-arc-blast).
[6] See, e.g., Arc Blasts Can Ruin Hearing, ISHN (June 3, 2019) (https://www.ishn.com/articles/110868-arc-blasts-can-ruin-hearing).

Scarce public educational and support funds should be directed toward programs with demonstrated safe work practices, high placement rates and long-term career outlooks, not toward training that leads graduates into a narrow, short-term corner of the workforce or toward little or no employment at all. The public interest is not served

by investing limited educational and support resources in a program that has not demonstrated that it leads to safe, good-paying jobs, or to any significant number of jobs at all.

The California State Association of Electrical Workers strongly urges Community Colleges, Workforce Development Boards, and other public agencies, organizations, and institutions to independently verify the history of actual California job placement outcomes, scope of work and electrical hazard exposure before making any funding, support, or facilitation commitment to these programs. California's limited training resources should be prudently expended to ensure they support safe and effective job development that provides real career opportunities.

The CSAEW appreciates your consideration of this letter. Please let us know if you have any questions or would like more information regarding these concerns.

Sincerely,

Neal H. Lauzon
President, CSAEW

California State Association of Electrical Workers

cc: IBEW 9th District

ADDENDUM

California contractor and trade worker requirements as they apply to companies or organizations offering maintenance and repair services for electric vehicle charging stations and related EV charging infrastructure.

This issue is becoming increasingly important as the installed base of EV charging infrastructure grows and an industry sector expands around the inspection, maintenance, repair, and ongoing operation of these systems.

Companies offering EV charging maintenance services which include electrical work are contracting to perform work that California law requires to be performed by a licensed contractor, particularly a C-10 Electrical Contractor.

When EV charging "maintenance" includes the repair, replacement, alteration, installation, disconnection, reconnection, or other physical electrical work on permanently installed EV charging equipment or the electrical system serving that equipment, California contractor licensing requirements apply.

Just as importantly, the licensing requirement applies not only to the electrical contractor or tradesperson physically performing the work, but also to the **company contracting with the customer and undertaking responsibility to provide those electrical repairs — even where that company ultimately subcontracts the electrical work to a licensed C-10 contractor.**

California's Definition of a Contractor

The starting point is **Business & Professions Code § 7026**, which broadly defines a contractor as a person who:

- undertakes or offers to undertake;
- purports to have the capacity to undertake;
- submits a bid to;
- performs directly; or
- performs **"by or through others"**

work to construct, alter, repair, add to, subtract from, improve, move, wreck, or demolish a building, parking facility, structure, project, development, improvement, or any part thereof.

The statute expressly includes subcontractors and specialty contractors.

This is significant because California's licensing law is not limited to new construction. **Repair and alteration are expressly included**, and the statute does not require the contracting entity to physically perform the work itself.

Accordingly, describing electrical repair work as "maintenance" does not remove that work from contractor licensing requirements.

Application to EV Charging Infrastructure

EV charging systems can include charging equipment, electrical conductors, breakers, disconnects, panels, conduit, charging cables and connectors, power electronics, communications equipment, and other associated infrastructure.

The maintenance of these systems can therefore involve activities ranging from routine non-electrical services to work that is clearly electrical contracting.

Activities such as the following generally present a lower contractor-licensing concern when performed independently of construction or electrical repair and maintenance:

- Visual inspection;
- Cleaning;
- Remote monitoring;
- Data collection;
- Network monitoring;
- Software and firmware updates;
- Remote diagnostics;
- Communications troubleshooting;
- Rebooting or resetting equipment without performing electrical work; and
- Identifying and reporting an electrical problem to the owner.

By contrast, companies that contract for maintenance involving activities such as the following **are required by law to hold a C-10 license:**

- Repairing electrical wiring;
- Repairing or replacing electrical components;
- Replacing contactors, breakers, disconnects, conductors, or power components;
- Repairing or replacing charging cables or connector assemblies where electrical connections are involved;
- Disconnecting or reconnecting hardwired charging equipment;
- Removing and replacing charging stations;
- Modifying electrical circuits;
- Energizing or de-energizing commercial electrical equipment and performing lockout tagout procedures;
- Repairing or replacing conduit or conductors;
- Repairing electrical supply equipment; or
- Altering the electrical system serving the charging station.

The principle is straightforward: **the actual work being undertaken controls the licensing requirement — not the label placed on the service contract.**

C-10 Electrical Contractor Classification and Requirement

The scope of the C-10 classification further supports this.

Under **California Code of Regulations, Title 16, § 832.10**, a C-10 Electrical Contractor is one who:

"places, installs, erects or connects any electrical wires, fixtures, appliances, apparatus, raceways, conduits... or any part thereof, which generate, transmit, transform or utilize electrical energy in any form or for any purpose."

EV charging equipment is electrical apparatus that utilizes and transmits electrical energy.

Accordingly, installation, electrical connection, replacement, alteration, and many forms of repair of EV charging equipment and its associated electrical infrastructure fall squarely within the type of work defined in the C-10 classification.

The Important Question: Who Is Contracting for the Repair Work?

Consider a company that sells a comprehensive EV charging maintenance program to property owners, charging-network operators, public agencies, or other customers.

Under the agreement, the company promises to inspect, maintain, troubleshoot, **repair, replace components, and restore charging stations to operation.**

The maintenance company does not hold a C-10 license. Instead, when electrical work is required, it retains a licensed C-10 electrical contractor to perform that portion of the work.

The fact that the downstream electrical contractor is properly licensed does **not resolve the licensing issue for the company holding the maintenance contract.**

Section 7026 specifically reaches a person who **undertakes, offers to undertake, bids, or performs contracting work "by or through others."**

Therefore, where an EV maintenance company:

1. Contracts directly with the customer;
2. Assumes responsibility for maintaining and repairing the charging system;
3. Offers electrical repair or replacement as part of its services;
4. Controls or arranges for the performance of those repairs; and
5. Uses a licensed C-10 subcontractor to physically perform the electrical work,

the maintenance company itself is acting in the capacity of a contractor and must hold an appropriate California contractor license.

The use of a licensed electrical subcontractor does not permit an otherwise unlicensed company to undertake a contract for work that itself constitutes contracting.

A Different Model: Monitoring and Referral

This should be distinguished from a company whose contractual responsibility is limited to activities such as:

Monitoring → Inspection → Cleaning → Software → Diagnostics → Reporting

If that company discovers an electrical defect and advises the owner that a licensed C-10 contractor must be separately retained — and the owner then contracts directly with the C-10 contractor — the monitoring company has a reasonable argument that it has not undertaken the electrical repair itself.

"Maintenance" Is Not a Licensing Exemption

The Contractors State License Law does not contain an exemption for work simply because it is characterized as maintenance.

The relevant question remains what work is actually being performed or undertaken.

Inspection, cleaning, monitoring, communications services, and software support may fall outside the traditional scope of contracting.

However, when "maintenance" includes **repair, alteration, replacement, installation, or electrical connection of installed EV charging equipment**, the work falls within the Contractors State License Law regardless of how the agreement is titled or characterized.

Electrician Certification is a Separate Additional Requirement

There is a second level of regulation that must be followed.

Labor Code §§ 108–108.5 establish California's electrician-certification requirements.

Accordingly, there are two distinct compliance issues:

1. Contractor licensing: Is the business contracting or offering to perform the work properly licensed?

2. Electrician certification: Are the individuals actually performing electrical work properly certified, registered as electrician trainees, enrolled as apprentices - and supervised by state certified electricians - or otherwise authorized under California law?

A properly licensed C-10 contractor must comply with all applicable workforce certification requirements.

Conversely, having a certified electrician perform the physical work does not eliminate the contractor-license requirement applicable to the business that undertook the contract.

Consequences of Unlicensed Contracting

The consequences of violating the Contractors State License Law are substantial.

B&P Code § 7028 generally makes acting in the capacity of a contractor without a license a misdemeanor.

B&P Code § 7031 imposes significant civil consequences on contractors that perform work requiring a license while unlicensed, including restrictions on recovering compensation.

Public works and public-agency contracting can raise additional licensing and bidding requirements, including those contained in **B&P Code § 7028.15**.