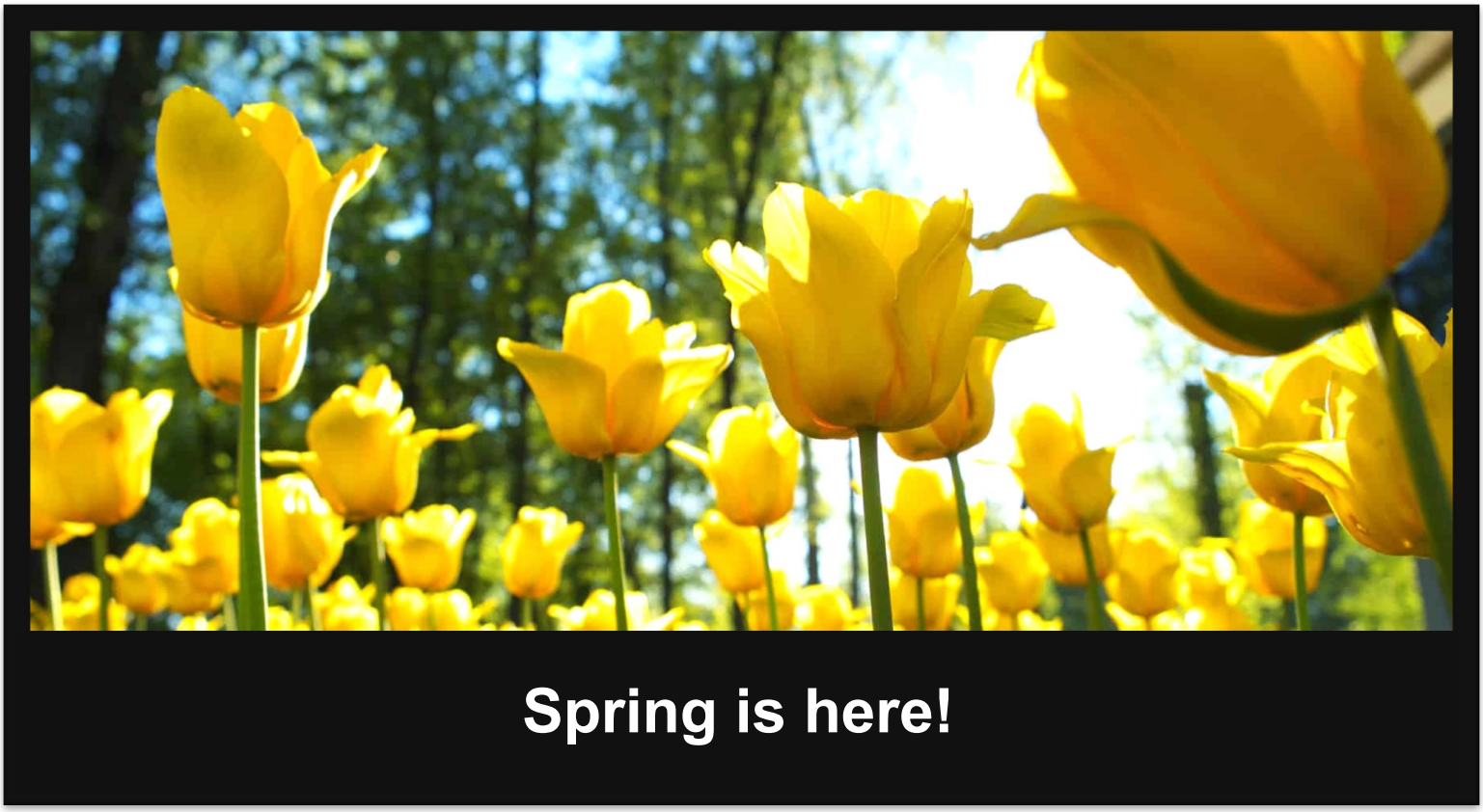
SYNERGY

OUR 62nd YEAR | CONTRA COSTA CHAPTER | April 2025



Spring is here!

In this issue:

Fault-Managed Power

Develops into a viable technology to serve customers' evolving needs

The old AC versus DC feud, first argued by electricity's founding fathers, Thomas Edison and Nikola Tesla, centers around which approach to generating and transporting electricity is safer and more efficient. AC won the early rounds, leading to the grid and building systems we know today. Now, though, a new digital approach to building-wide distribution is forcing some to reconsider their old AC/DC assumptions, especially as DC-powered devices proliferate through homes and businesses. Promising safe operation with low losses and much easier installation requirements, fault-managed power (FMP) could become a new standard for commercial and industrial facilities, with conduit-free installation that is as easy as running low-voltage cable.

FMP could lead to big changes in the ways traditional electrical contractors do their work, especially where long wire runs are common. Equipment costs might be too high, for now, for smaller projects. But labor savings could quickly become a decider for many developers, especially as DC-based electronics become the rule in lighting, controls and other equipment.

Fault-Managed Power Makes its Way into the Code and Buildings

A safer, more-efficient way to deliver greater than 100 Watts will be defined as Class 4, and promises to disrupt the market ... eventually.

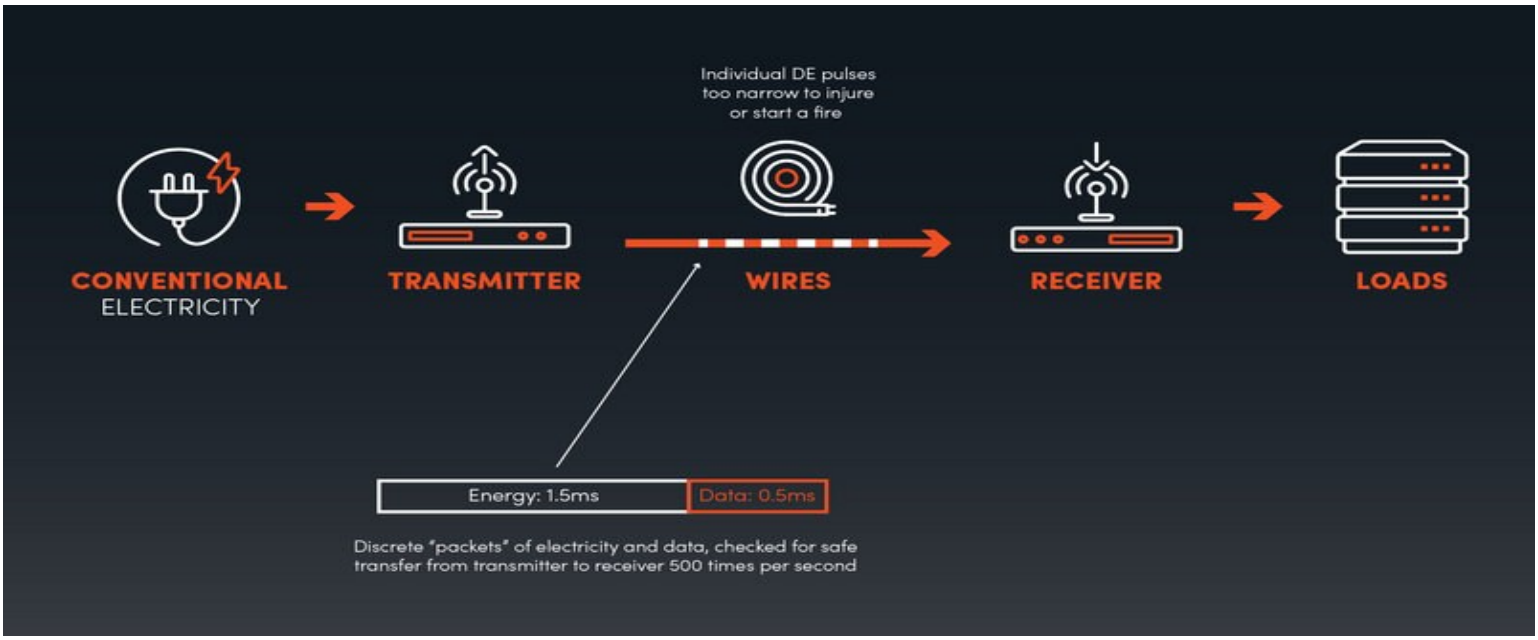
Over the past two decades, power over Ethernet (PoE) delivered via category twisted-pair copper cabling along with data has become the primary remote powering technology for networked devices like wireless access point, surveillance cameras, digital displays, and LED lights. As defined by the National Electric Code (NEC), PoE is considered a Class 2 limited power circuit (Article 725), which cannot exceed 60 VDC and is limited to 100 Watts (W). At these levels, Class 2 limited power circuits are also considered safety extra low voltage (SELV) power per the International Electrotechnical Commission (IEC).

Not all Class 2 power is PoE—Class 2 power can also be delivered separately from data via 12 to 24 AWG copper conductors like those used in hybrid copper-fiber cables that are ideal for devices located beyond the 100-meter distance limitation of PoE. With all Class 2 power circuits limited to 100 W, there hasn't been many safe options for devices that require more power. But that's all changing with new Class 4 power making its way into the 2023 National Electric Code® (NEC) as Article 726.

What is Fault Managed Power (FMP)?

FMP, or Class 4 power, is a state-of-the-art power distribution system that safely delivers high power levels over long distances while reducing the risk of fire and shock. It converts alternating current (AC) power to high voltage direct current (DC) power through a solid state, enhanced rectifier, known as a transmitter.

AC is an electric current that periodically reverses direction and changes its magnitude continuously with time, while DC flows only in one direction. The transmitter pulses the DC power in 2-millisecond "packets," consisting of a 1.5-millisecond high-voltage DC power pulse (336V) followed by a 0.5-millisecond pause or gap. At the destination, a receiver device converts the pulsed DC power to the required load type. The receivers, designed to match the load demand, convert pulses into various DC voltages or even AC power, up to 277V, with 480V capabilities in development.



Fault Managed Power:

A power distribution system that converts AC power to high voltage power.

This inherently safer form of electricity simplifies electrical construction and maintenance because it installs with the same practices as data cabling, using IT installation practices.

Click here to read full article.

Fault Managed Power

Seven Signs of Market Adoption

VoltServer Digital Electricity

1. Fault Managed Power Is Progressing

Fault managed power platforms continue to innovate—and our new third-generation Digital Electricity platform, Tetra, is the perfect example.

Tetra is built on the premise of safety without compromise, just like other forms of Digital Electricity. But it also sets a new standard for reliability and continuity, making fault managed power possible in even more markets and applications.

Setting a new benchmark for long-range power delivery, Tetra:

- **Delivers 250% more power than any other UL-listed system, safely distributing high power over distances exceeding a mile.**
- **Requires less infrastructure than previous Digital Electricity systems, making it a fast, easy, plug-and-play platform.**
- **Is designed and engineered for your specific application and is compatible with different cable vendors and cable constructions so it's easier to install and maintain.**
- **Can be deployed indoors or outdoors and in environments requiring different power levels and/or voltages.**
- **Enables power visibility and control, so you can see when, where, how, and why power is being used.**

Read more about Tetra.

2. More Manufacturers Are Getting on Board

As more cable and electronics manufacturers get involved with and support fault managed power, its ecosystem is becoming broader.

Whether they're developing full fault managed power systems, embedding the technology within systems, or developing the supportive structured cabling systems required to support FMP, the number of manufacturers dedicating themselves to this innovation is growing every year.

These manufacturers are all on the same mission: to improve safety and energy efficiency through the use of fault managed power.

Meet our FMP partners.

3. The Industry United Under the FMP Alliance

In 2024, the leaders in power technology came together to advance the use of fault managed power and help adjacent industries discover its benefits. The official formation of the FMP Alliance gives us a chance to advocate for, promote, and accelerate fault managed power adoption together.

We do this as a group by:

- **Acting as a single voice to promote the merits and applications of FMP across many industries**
- **Contributing to FMP regulations and the move toward interoperability and standardization**
- **Educating different industries and stakeholders about the benefits of FMP technology**

Learn about the FMP Alliance.

4. FMP Is Powering More Types of Applications

Digital Electricity solutions are already in place in large sports stadiums, office towers, hotels and railway systems. But continued innovation makes it more applicable to a wider variety of environments.

This past year, for example, Digital Electricity was deployed at The Vintage Club, an ultra-private, ultra-exclusive resort in Coachella Valley, part of California's Indian Wells. The owners wanted to ensure efficient, sustainable power distribution without compromising safety or reliability. Digital Electricity made it possible for The Vintage Club to deploy decentralized, zone-based architecture to serve up the experiences its members and residents expect.

Digital Electricity has also recently been deployed in:

- **Parking lots**
- **Extended campuses and outdoor spaces**
- **Airport security**
- **Warehouses and distribution centers**

Learn how they brought FMP to a luxury resort.

5. The World Needs More Power

Demand for electricity continues to accelerate. In fact, it's projected to increase by 185% by 2050. What's driving this growth?

There are four big factors at play:

- **Population expansion**
- **Increases in manufacturing output**
- **More EVs on the road**
- **Rises in data center energy consumption to support AI**

Fault managed power is the answer to making sure all these needs can be addressed. The technology is safer to install than traditional electricity and follows wiring practices associated with low voltage cables like Ethernet, so there are more qualified workers available to install it. It's more affordable to deploy than traditional methods, and it provides more power over longer distances.

Learn more about our high-energy future.

6. Codes and Standards Continue to Be Developed

Both UL 1400-1 and UL 1400-2 are on their journeys from Outlines of Investigation to becoming published standards. UL 1400-1 outlines requirements for fault managed power systems, while UL 1400-2 focuses on the structured cabling that supports fault managed power systems.

Both are already immersed in the ANSI approval process and are being used to certify products. Once approved, both UL 1400-1 and UL 1400-2 will be fully implemented as official standards.

Having official standards in place will give manufacturers a consistent set of guidelines to follow, leading to more uniformity in product design and performance. This will accelerate the number of fault managed power systems in the market, lead to increased innovation, and drive demand for more FMP solutions.

In 2024, VoltServer also announced a partnership with Current/OS Foundation to advocate for and promote the adoption and development of an open standard system for direct current (DC) distribution to make DC mainstream.

As DC microgrids offer a more sustainable alternative to traditional alternating current (AC) networks, interoperability will be crucial for adoption. Fault-managed power is an ideal match for the growing numbers of people and organizations leveraging DC microgrid solutions.

Learn about our partnership.

7. More FMP-Focused Training Is Being Developed

With the launch of our Digital Electricity Certified Training Program, we're helping professionals get ready to support more modern electrical systems. The first course in our series is already available to help professionals better understand key electrical concepts, safety practices, and power system dynamics.

Through this training, professionals will have access to the knowledge they need to address global energy challenges, safely implement power distribution, and understand how and where FMP fits into the picture.

Start your FMP training.

While "Digital Electricity" is a trademarked term used by VoltServer for their patented technology, "Fault Managed Power" (FMP) is a more general term for a system that monitors and controls power delivery to limit fault energy, and the two are often used interchangeably.

The Importance of Prompt Engineering for AI

by Sean Lazarian – ESSCO
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Many years ago, we all had to develop internet search skills. Like a sports athlete must practice hitting a ball or martial artists must practice throwing a punch, we all had to learn how to Google something (or Yahoo something, or even Netcrawler something). The same holds true for AI – we must develop skills that help us use the tool more effectively. For AI, this skill is prompt engineering.

What is prompt engineering? The prompt is simply the first thing (or things) you type to the AI. It sets the stage for everything that comes after it. To understand why prompt engineering is so important, you must understand how AI works. Put very simply, modern AI works like our brains do, because it was designed to mimic how our brains function. In AI, there are nodes and connections (think of them like brain cells and electrical connections between the brain cells). In a brain, the connections that are larger conduct electricity first, and that determines which thought you have next (like how electricity flows through the larger wire sizes because there's less resistance). In AI, we mimic stronger connections by adding weights and multipliers. This increases the odds and pushes the "thought" from one node to another, eventually ending up with a conclusion. **The accuracy of an AI response is heavily dependent on the weights and multipliers being correct, so that the right answer is chosen for a certain question.**

Back to prompt engineering and why it's so important. The problem with AI is not that it doesn't have the right information – the problem is that it has too much information. Prompt engineering confines the information to be what you want, steering the AI away from the kinds of information you don't want. Underneath the hood, it adjusts the weights and multipliers, so the system flows to the right kinds of nodes. For instance, if you ask an AI "What is EMT?", it could talk about thin wall electric conduit or it could talk about emergency medical technicians. How does the system know what kind of genre or world you are talking about? It can take a guess, but to be more accurate you should give it an initial prompt of "I am an electrical contractor who is running conduit." That pushes the AI to be in the world of electrical construction instead of medical.

The more specific the initial prompt, the better. If you want to upload a project specification to an AI and ask it questions, tell it that you are a Union Electrical Contractor in Los Angeles County working on a public-school job. Tell it to use the latest NEC electrical code and Los Angeles City code. Tell it to only give you answers that are 85% or higher in confidence level. There isn't any complex coding when it comes to AI prompt engineering – it's simply a set of regular written commands that push it to have the right weights and multipliers for what you are talking about.

Thank You!

We wish to thank the Los Angeles County Chapter office of NECA for allowing us to share this article written by their member, Sean Lazarian, of ESSCO.

NECA CODE QUESTION OF THE DAY

Listen and Subscribe

Tune in to **NECA's Code Question of the Day Podcast,** where we break down real-world electrical code questions submitted by industry professionals across the country. Each episode features expert insight, practical interpretations, and tips related to a specific Code topic. Whether you're a seasoned electrician or just starting out, this podcast keeps you sharp and up to speed.

Labor Relations Bulletin

FROM THE NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION

REAL ID and Federal Construction

On May 7, 2025, the long awaited enactment of the REAL ID Act of 2005 will be in place, requiring any individual that boards a domestic flight or enters a Federal facility to be compliant.

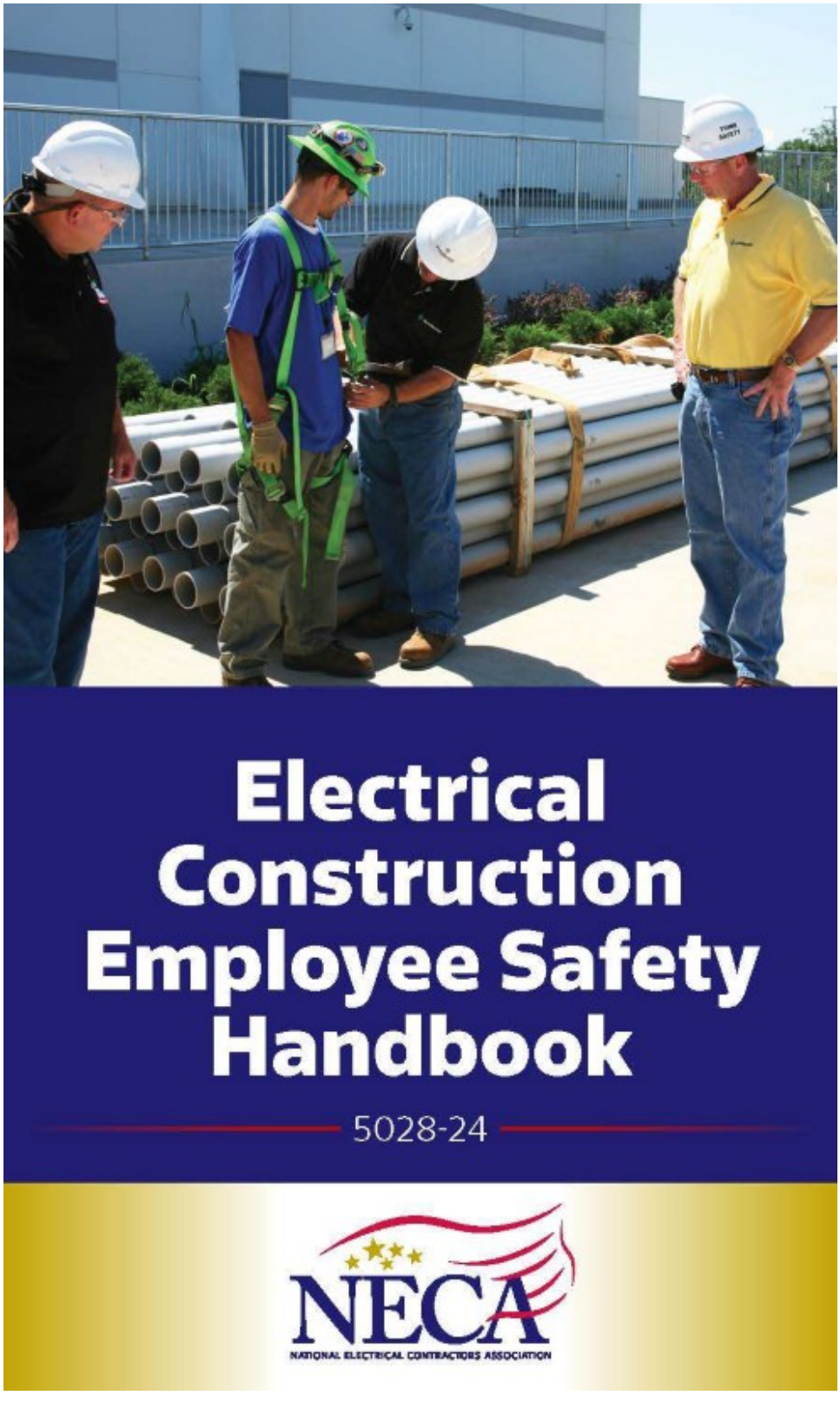
NECA contractors should be vigilant to their employee's ability to comply with the Act as it could directly impact workforce mobility and jobsite access. Starting on that date, individuals will need a REAL ID-compliant driver's license or another acceptable form of identification (like a passport) to board domestic flights or enter certain federal facilities, including some military bases and government buildings where NECA contractors may perform work. If employees, subcontractors, or project partners are turned away due to non-compliant IDs, it could cause delays, missed deadlines, or access issues on federally funded jobs.

REAL ID resources are available through the US Department of Homeland Security website. Being proactive now helps ensure crews are ready and projects stay on track.

This material is for informational purposes only. The material is general and is not intended to be legal advice. It should not be relied upon or used without consulting a lawyer to consider your specific circumstances, possible changes to applicable laws, applicable CBAs, prime contracts, subcontracts, rules and regulations and other legal issues. Receipt of this material does not establish an attorney-client relationship.

NECA Releases Updated Electrical Construction Employee Safety Handbook

Mar 26, 2025



Washington, D.C. — The National Electrical Contractors Association (NECA) is proud to announce the release of the updated Electrical Construction Employee Safety Handbook (5028-24)—now available for purchase in the NECA Store.

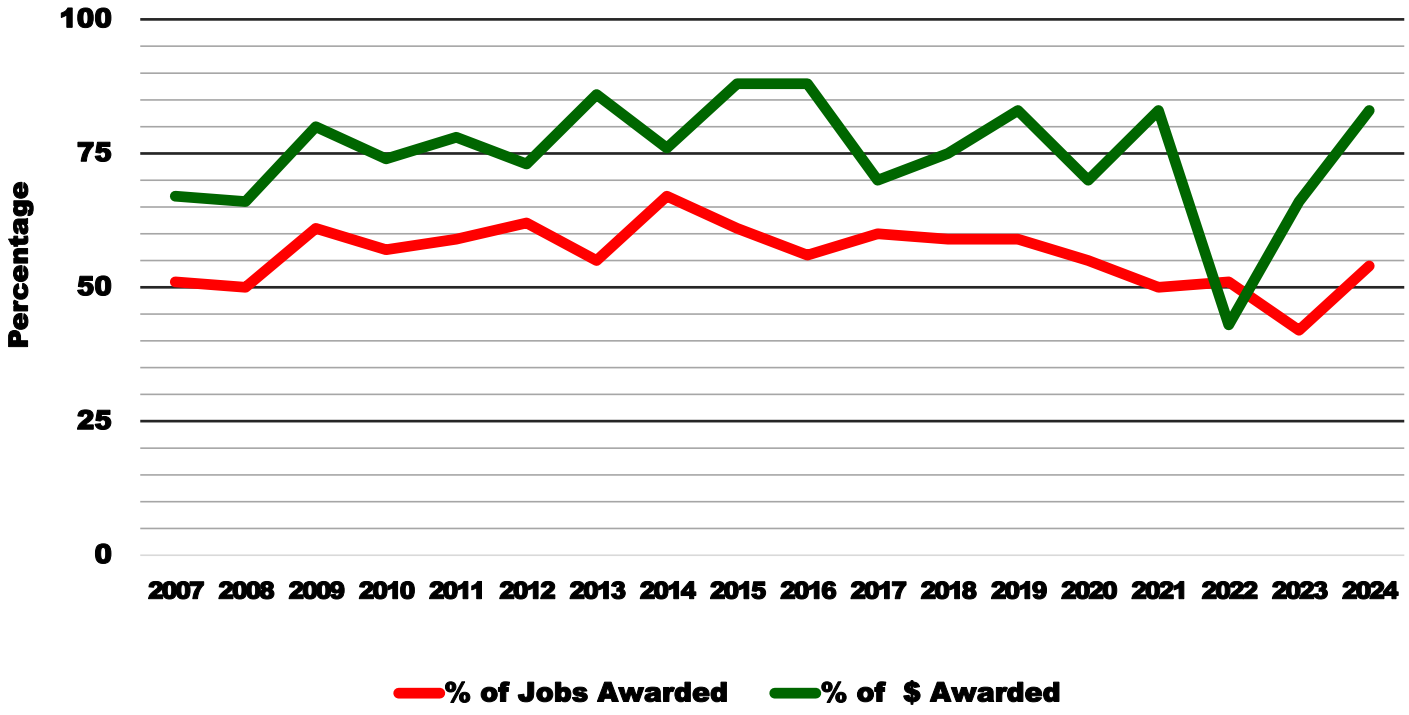
This newly revised handbook merges the best of the previous *Employee Safety Handbook* and *OSHA Safety and Health Digest*, providing a comprehensive resource for electrical workers. Designed to enhance workplace safety and regulatory compliance, it delivers a summary of essential safety topics, worker responsibilities, and key references to OSHA Construction Standards. This critical guide helps electrical workers understand and adhere to the safety requirements and regulations that directly impact their profession.

Pricing:

- **NECA Members:** $5
- **Non-Members:** $10

NECA-IBEW

Market Share of Public Works Projects in Contra Costa County



SYNERGY Links
Inside Wireman Wage Rates, Cost-per-Hour, and Shift Rates
Sound and Communications Wage and Fringe Schedules A, B, C, D, & E
Sound and Communications - Schedule E: Cost/Hour Shift Rates
CE/CW Wage Schedule Effective January 1, 2025
Summary Annual Report: Electrical Workers Health and Welfare Plan
Summary Annual Report: Electrical Workers Retirement Plan

April 2025

Sun	Mon	Tue	Wed	Thur	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12 **2025 Benefit Fair Local 302**
	April 7th - 9th **NECA NOW** **Hollywood, FL**					
13	14	15	16	17 **JATC** **Training Center Martinez** 2:00 p.m.	18	19
	21	22	23	24	25	26
27	28	29	30			

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