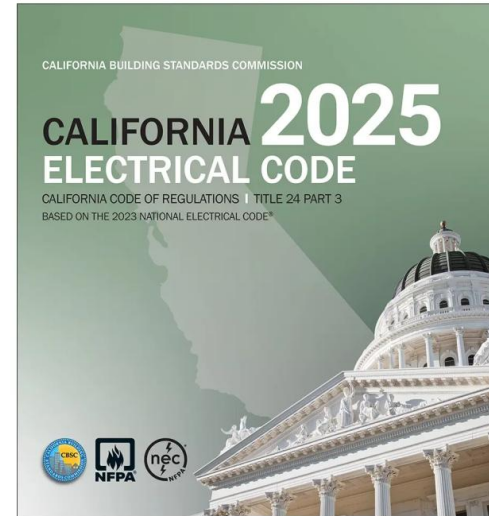




Implementing the New Electrical Safety Requirement

Embracing Change for 2027 & Beyond

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619-677-8682
October 2026

Objectives

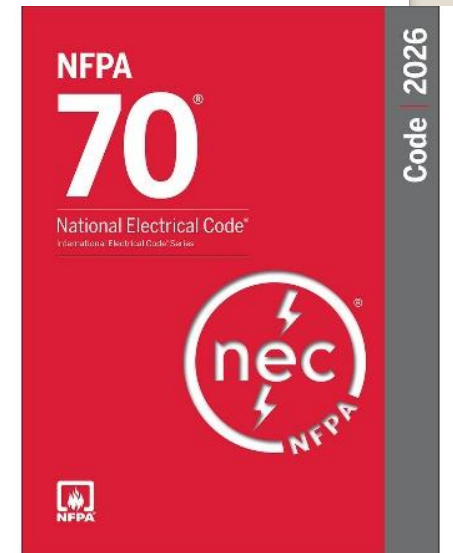
- Identify overlapping components in NFPA standards as pertains to:
 - Electrical installations
 - Maintenance requirements of electrical systems
 - Personnel protection during preventative maintenance activities.
- Provide updates on 2026 National Electrical Code applicability to **California** Electrical Code.
- Merge code updates with
 - 2026 edition of NFPA 70B (Electrical Equipment Maintenance)
 - 2027 edition of NFPA 70E (Electrical Safety in the Workplace).

Don't judge a book by its cover!



Overlapping Components

- Code
 - Set of Rules.
 - Not law but can be adopted into law.
- Standard
 - Detailed elaboration of code.
 - The nuts and bolts of meeting code requirements.
 - AHJ Responsible for enforcing requirements of code/standard.



Q: An organization can have a(n) AHJ.

Yes, No, Trick Question?

Authority Having Jurisdiction (AHJ)

An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

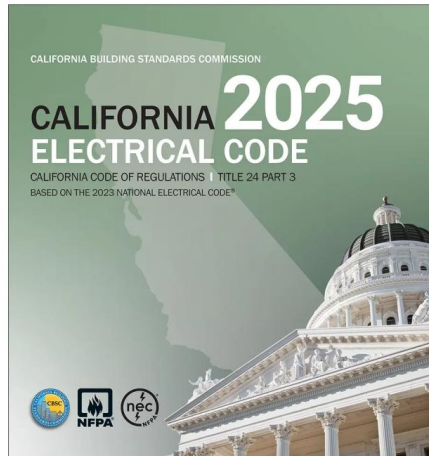
Q: Is NFPA 70E/70B are voluntary standards and not something OSHA enforces?

Yes, No, Trick Question?

A: From an enforcement perspective, OSHA does not enforce NFPA 70E, however, use NFPA 70E to support citations for violations relating to certain OSHA standards

From code prospective states will typically adopt codes related to fire protection with respect to building codes (such as NFPA 1 (fire)/NFPA 101 (life safety)/NFPA 70 (electrical)).

Overlapping Components



NFPA 70 National Electrical Code® International Electrical Code® Series Code 2026 nec NFPA	NFPA 70B Standard for Electrical Equipment Maintenance International Electrical Code® Series 2026 NFPA nec	NFPA 70E Standard for Electrical Safety in the Workplace® International Electrical Code® Series Standard 2027 nec NFPA
Electrical design & Installation	Electrical preventive maintenance programs	Safe work practices when working on electrical systems

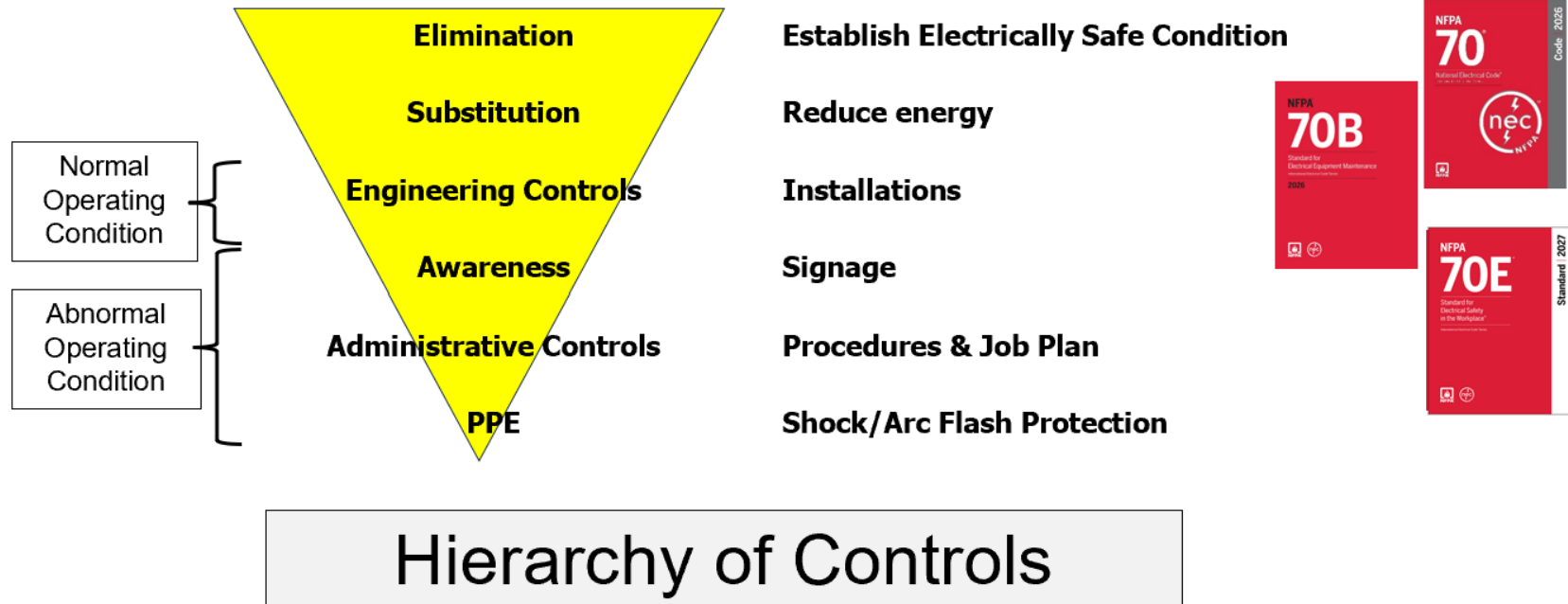
Overlapping Components

- Normal operating condition
 - Discussed in several NFPA standards (70E & 70B)
 - Refers to equipment or systems functioning as intended.
 - Interacting with it as intended.
 - Normal operation does not require a qualified person and is *considered low risk* if performed as designed.
 - Engineering controls

Overlapping Components

- Normal operating condition (Summary)
 - **Equipment is properly installed.**
 - Equipment is rated for available fault current.
 - Equipment is used in accordance with instructions included in listing and labeling.
 - **Equipment is properly maintained.**
 - Equipment doors are closed and secure.
 - Equipment covers are secure and in place.
 - No evidence of failure.

Overlapping Components



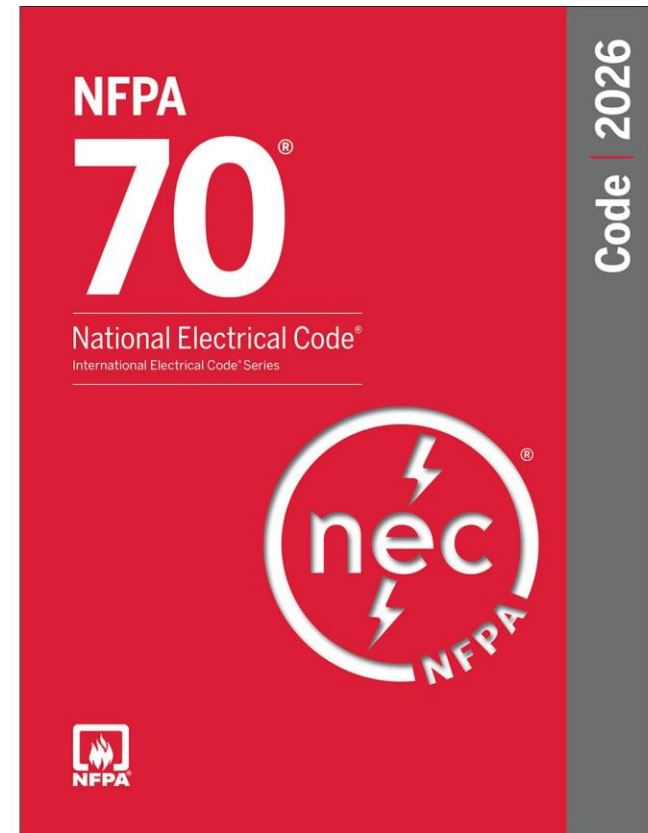
Q: This operation here is a **normal operating condition.**

Yes, **No**, Trick Question?



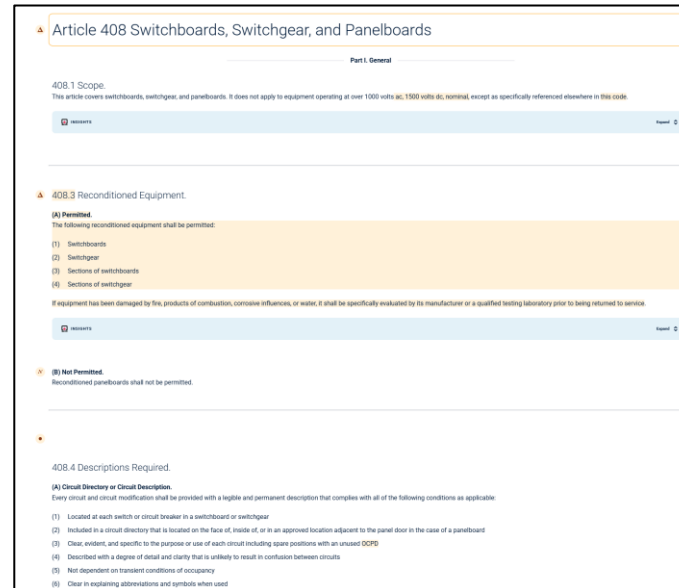
NEC (NFPA 70)/CA Electrical Code

- Authoritative document addressing electrical installations.
- Revised every 3 years to stay in sync with industry practices, emerging trends, and introduction of technologies.
- Provide comprehensive rules for designers, installers, inspectors, engineers, electricians, and anyone else who works in the electrical industry.



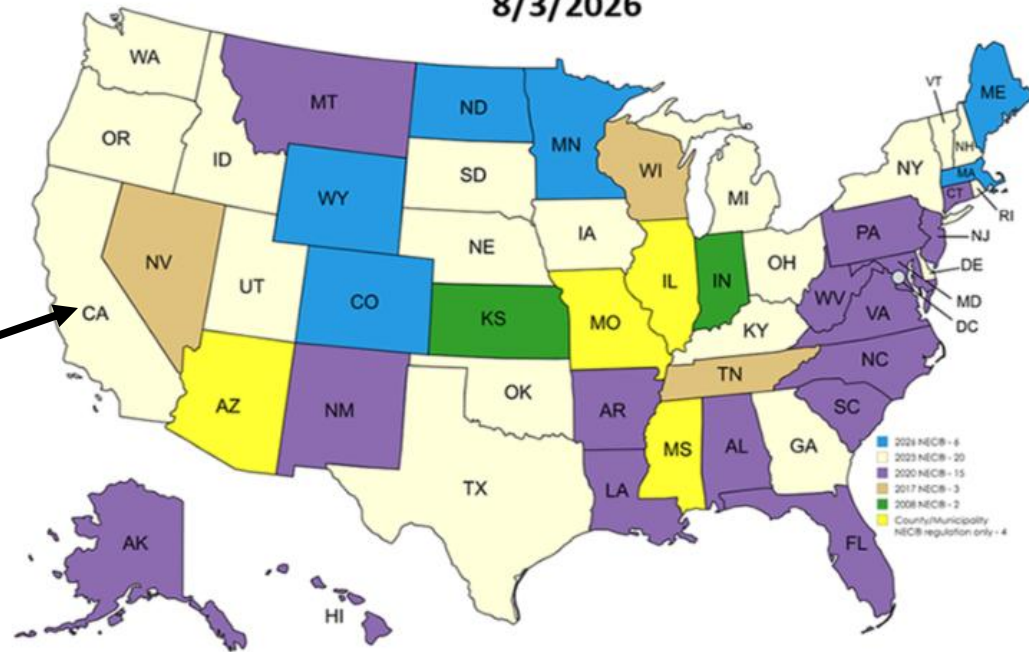
NEC (NFPA 70)/CA Electrical Code

- Example: Panelboards.
- NEC/CEC will give construction requirements.
- Equipment properly installed.



NEC (NFPA 70)/CA Electrical Code

NEC® In Effect
8/3/2026

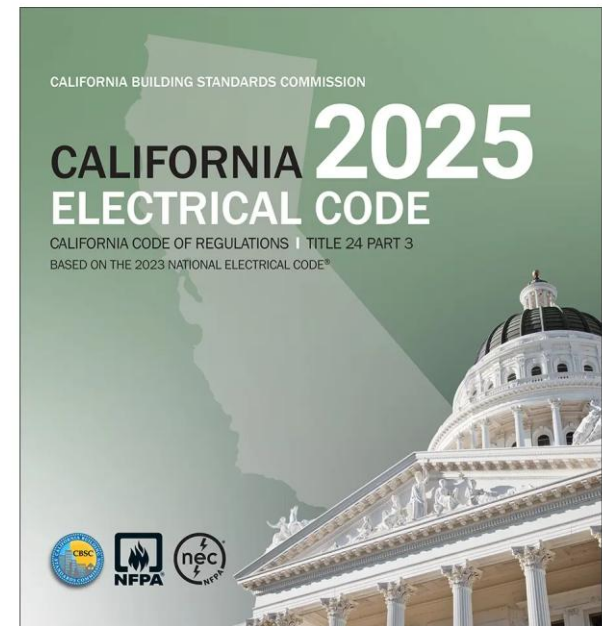


2023 Edition

Source: [nfpa.com](https://www.nfpa.com)

California Electrical Code (CEC): Title 24 and NEC Adoption

- CEC does not necessarily adopt NEC verbatim.
- CEC is codified and incorporates 2025 Edition of NEC with CA-specific amendments.
- All electrical work must pass the local AHJ.



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Development Services

DSO Home Permits, Approvals & Inspections News & Programs Zoning Codes & Regulations Forms & Publications Public Hearings, Meetings & Notices Fees Records Building & Land Use Enforcement

Electrical Permit

Electrical permits ensure projects comply with the minimum standards that help safeguard life or limb, public health, property and welfare. No electrical wiring, device, appliance, or equipment shall be installed within or on any structure or premises, nor shall any alteration, addition, or replacement be made in any existing wiring, device, appliance or equipment unless an Electrical Permit has been obtained for the work, except as exempted as stated below.

Based on your desired work scope, an electrical permit may be a **Simple "No-Plan" Electrical Permit** or a **Plan (required) Electrical Permit**. See [Information Bulletin 103](#) to determine whether the scope of work qualifies for a Simple "No-Plan" Electrical Permit.

Simple "No-Plan" Electrical Permit

Homeowners, property owners and licensed contractors can obtain a Simple No-plan Electrical Permit for minor installations for all **non-historically or potentially designated properties only**, including:

- Meter reset/re-connections.
- Adding circuits.
- Miscellaneous wiring, such as relocation of electrical outlets or re-wiring.
- Temporary power poles for construction sites.
- Electric vehicle charging stations for private garages.

Plan (required) Electrical Permit

Electrical plans and calculations are required for all electrical projects that do not qualify for a Simple "No-Plan" Electrical Permit or for electrical projects in historically designated or potentially historically designated properties unless exempted in [San Diego Municipal Code §129.0303](#).

An Electrical Permit is required for all electrical work, including Electric Vehicle Charging Systems (EVCS). This permit can only be issued to a licensed California State Contractor authorized to perform electrical installations or to the property owner or lessee.

Please ensure your proposed scope of work does not require a [Building Permit](#).

[Apply for a Plan Permit](#)

Online Permitting Portal Record Type Selection Options

- 1. Single-Dwelling Unit, Duplex or Townhome Projects**
Once you are in the online permitting portal, select, "No-Plan - Residential - Combination Mech/Elec/Plum" under the Simple No Plan Permits category when you initiate the application process.
- 2. Multi-Family Residences, Apartments, Commercial and Non-Residential Projects**
Once you are in the online permitting portal, select one of the "No-Plan - Nonresidential/Multifamily" permits for either the electrical, mechanical, or plumbing project under the Simple No Plan Permits category when you initiate the application process.

[Review IB-103](#) for a list of qualified and excluded projects for Simple No-Plan Permits.

The permit will be issued once you submit your application and pay the invoice. Once issued, an inspection can be scheduled.

[Apply for a Simple Permit](#)

NEC (NFPA 70)/CA Electrical Code

- City of San Diego adopts the CEC with local amendments and enforces via Development services.
- <https://www.sandiego.gov/development-services/permits/electrical-permit>

NEC (NFPA 70)/CA Electrical Code

- **Current code:** 2025 CEC (based on NEC 2023 with California amendments), effective **January 1, 2026**
- **Next cycle:** 2028 CEC (based on NEC 2026 with California amendments), effective **January 1, 2029**



26 NEC/28 CEC

NEC (NFPA 70)/CA Electrical Code

- **Arc Flash Labeling**
- Previous Code only required arc flash warning labeling of service and feeder equipment of 1,000A or more.
- Now required for all non-dwelling distribution equipment, and the arc flash label must include specific information
 - Date the arc flash assessment was completed.
 - Reference to NFPA 70E for worker protection.

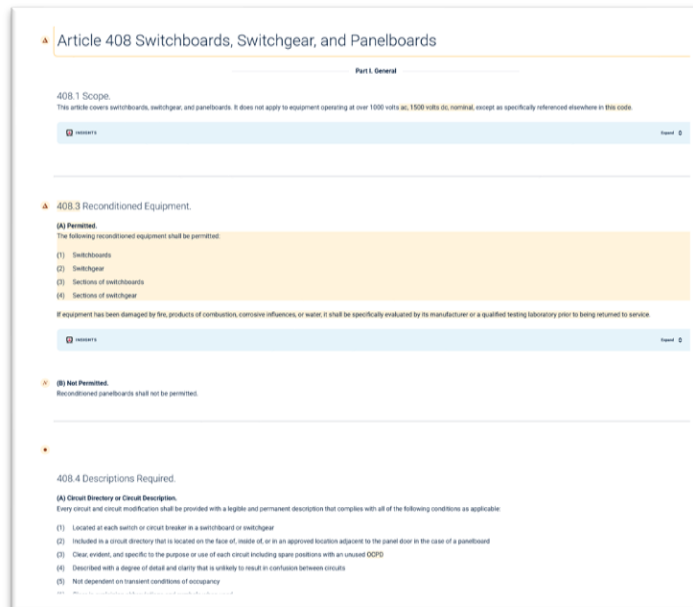
 WARNING	
Arc Flash and Electric Shock Risk	
63 in	Arc Flash Boundary
8 cal/cm ²	Arc Flash Hazard at 18 in
Arc Rated Clothing Required (See NFPA 70E-2021 Table 130.5(G) for required PPE) Note PPE Selected must have an Arc Rating equal to or greater than 8 cal/cm ²	
480 VAC	Shock Hazard when cover is removed
00	Glove Class
42 in	Limited Approach
12 in	Restricted Approach
MTA# 24-236	
1L7	DATE: 7/2024

Date completed

26 NEC/28 CEC

NEC (NFPA 70)/CA Electrical Code

- **Installation Instructions**
 - A manufacturer's installation instructions cannot conflict with NEC requirements.



NF/NFOM Panelboards

Class 1670

Instruction Bulletin

80043-741-03, Rev. 06
02/2023



26 NEC/28 CEC

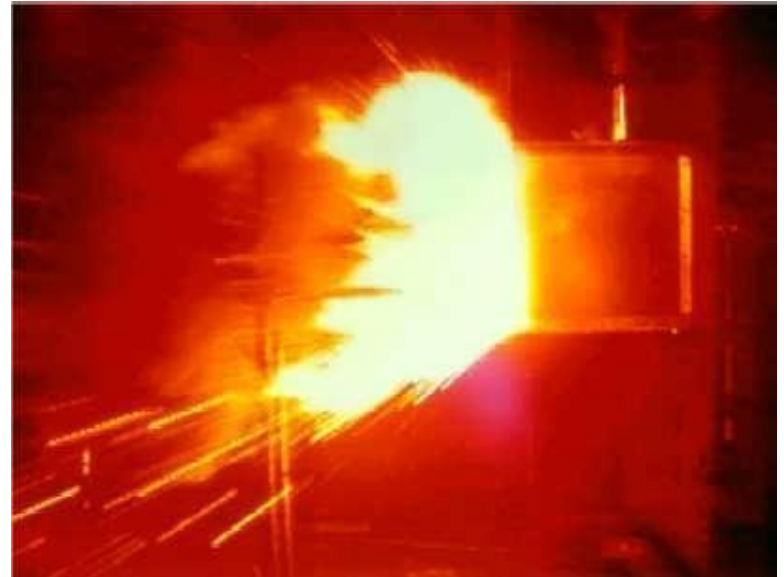
- **Other Changes**
 - **New Energy Technology:**
Includes updated code provisions for:
 - Integration of energy storage systems,
 - Photovoltaic (PV) installations,
 - Electric vehicle power transfer systems
 - **Grounding and Bonding Safety:**
 - Detailed grounding, bonding, and load calculation requirements



26 NEC/28 CEC

- **Case Study**

- A worker was injured from arc flash upon closing the main circuit breaker during commissioning operations on a 480-VAC Panelboard.
- The root cause of the arc flash incident was attributed to improper installation of wiring on the panelboard.



**Equipment not properly installed
= Abnormal Operating Condition**

Q: An effective electrical equipment maintenance program is essential in ensuring engineering controls properly protect the worker.

☒ Yes No, Trick Question?

Maintenance (NFPA 70B)

- Details preventive maintenance for electrical equipment.
- NFPA 70B helps users develop and carry out an effective Electrical Maintenance Program (EMP)
 - Prevent equipment failures and incidents.
 - Establish “condition of maintenance” for equipment that is required to be compliant when assessing risk in accordance with NFPA 70E®, Standard for Electrical Safety in the Workplace®.



Maintenance (NFPA 70B)

Steps in establishing EMP

1

Survey Equipment

Equipment	Definition	NFPA 70B (2026) Reference Chapter	Equipment Present in facility?	Inventory?	Maint Pro in place?
Battery ESSs	Battery energy storage systems (ESS) having a capacity greater than 3.6 MJ (1 kWh) that could be stand-alone or interactive with other electric power production sources.	32			
Busways	A raceway consisting of a metal enclosure containing factory-mounted, bare or insulated conductors, which are usually copper or aluminum bars, rods, or tubes.				
Cable trays	A unit or assembly of units or sections and associated fittings forming a structural system used to securely fasten or support cables and raceways.				
Electric vehicle power transfer systems	Electric vehicle power transfer systems and associated equipment.				
Fuses	Fuses to protect branch, feeder and service conductors.				
GFCIs	A device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a ground-fault current exceeds the values established for a Class A device.				
Grounding and bonding	Requirements for grounding and bonding of electrical systems				
Lighting	Luminaires and lighting systems				
Medium-voltage power circuit breakers	Circuit breakers and their enclosures:				
Molded-case/insulated-case/low-voltage power circuit breakers	(1) Molded-case circuit breakers (MCCBs) rated less than or equal to 1000 V ac (2) Insulated-case circuit breakers (ICCBs) rated less than or equal to 1000 V ac (3) Low-voltage power circuit breakers (LVPCBs) rated less than or equal to 1000 V ac (4) Medium-voltage power circuit breakers (MVPCBs) rated greater than 1000 V ac to less than or equal to 69 kV ac				
Motor control equipment	An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.	28			
Panelboards	A single panel or group of panel units designed for assembly in the form of a single panel, including buses and a automatic overcurrent devices, and equipped with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet, enclosure, or cutout box placed in or against a wall, partition, or other support; and accessible only from the front.	13			
Switchboards	A large single panel, frame, or assembly of panels on which are mounted on the face, back, or both, switches, overcurrent and other protective devices, buses, and usually instruments.	13			
Photovoltaic systems	Solar photovoltaic (PV) systems and its associated equipment.	30			
Portable electrical tools and equipment	Portable electrical tools and equipment, both cord and plug connected and temporarily hard-wired.	29			
Power and distribution transformers	Power and distribution transformers.	11			



Steps in establishing EMP

2

Procedures/
Plan of
Servicing

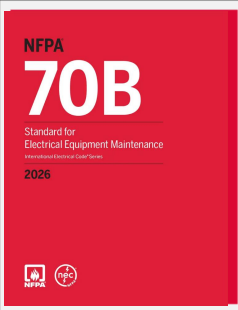
- NFPA 70B provides maintenance intervals by equipment type and condition.



Example: Panelboards

Maintenance (NFPA 70B)

Steps in establishing EMP

 Table 9.2.2	 Article 120 (LOTO) Chapter 1 (Safety Related Work Practices)
Visual inspection	May/may not be done energized.
Cleaning	Done de-energized.
Lubrication	Done de-energized.
Mechanical inspections	Energized or de-energized.
Electrical testing	Done Energized.

Maintenance (NFPA 70B)

Steps in establishing EMP

Unpin Header

Table 9.2.2 Maintenance Intervals

Product	Scope of Work	Equipment Condition Assessment		
		Condition 1	Condition 2	Condition 3
All equipment	Infrared thermography	12 months	12 months	6 months

Table 9.2.2

Table 130.5(C)

IR Thermography

Done Energized.

Example: Panelboards



Maintenance (NFPA 70B)

Estimate Likelihood of arc flash: NFPA 70E-Table 130.5(C)



TASK	Equipment Condition	Likelihood of Occurrence of arc flash
Opening of hinged doors or covers or removal of bolted covers to exposed electrical conductors.	Any	Yes
 Applicable Standards		
Job Safety Planning & Job Briefing (NFPA 70E-Article 110.5(I)) Risk Assessment Procedure (NFPA 70E-Article 110.5(H)(1)) Arc Flash Boundaries (NFPA 70E, Article 130.5) Shock Boundaries (NFPA 70E, Article 130.4) PPE (NFPA 70E, Article 130.7) Training (NFPA 70E-Article 110.6(A)(1))		

Maintenance (NFPA 70B)

Frequency of maintenance is based on condition of equipment (panelboard example).

Condition	Assessment Results	Maintenance Frequency
1	Maintained at required intervals.	60 months
2	Previous maintenance cycle revealed issues requiring the repair or replacement of major equipment components.	36 months
3	Equipment has missed the last two successive maintenance cycles.	12 months

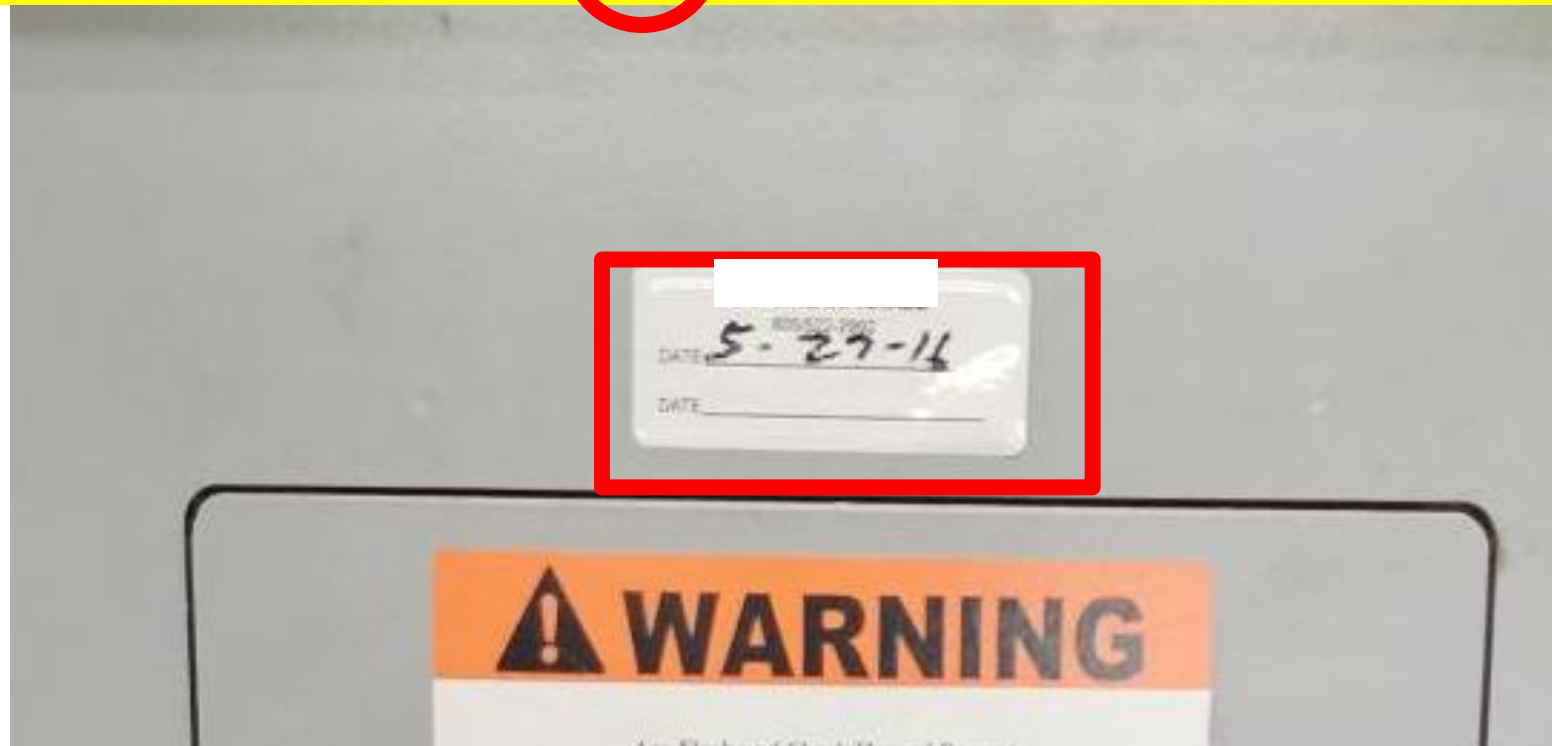
Concerns?

 DANGER		
Shock and Arc-Flash Hazard		
480	VAC	Shock Hazard
00		Class Gove with Leather Protectors
42	Inch	Limited Approach (Fixed Circuit)
12	Inch	Restricted Approach
8	cal/cm^2	Incident Energy at 18 in
52	Inch	Arc Flash Boundary
ARC FLASH PPE REQUIRED		
WARNING: Power system changes will invalidate the information of this label		
Job # 1000000	2/4/2020	By: LGM

Maintenance (NFPA 70B)

Q: This indicates a normal operating condition.

Yes **No**, Trick Question?



Maintenance (NFPA 70B)

3

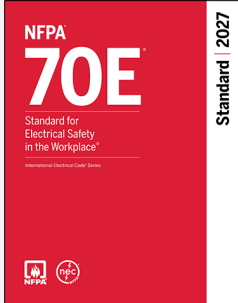
Inspections/ Testing

Table 13.3.5 Panelboard and Switchboard Electrical Testing

No.	Task	Test Type*
1.	Check Electrical Hardware Connections	NA
2.	Measure insulation resistance of the main bus	2
3.	Measure insulation resistance of control wiring	2A
4.	Test protective devices and systems	2
5.	Perform system operational tests	1 or 2

Some testing operations
may need to be
performed with
equipment energized.

Maintenance (NFPA 70B)

 Article 6.3, 6.4, 6.7	 Article 130.5(E)(1) Article 130.5(F) Article 130.5(G)/(H)
• Short-circuit studies • Coordination studies • Incident Energy Analyses	Requires incident energy analysis be performed for administrative and PPE controls.
Performed every 5-years	

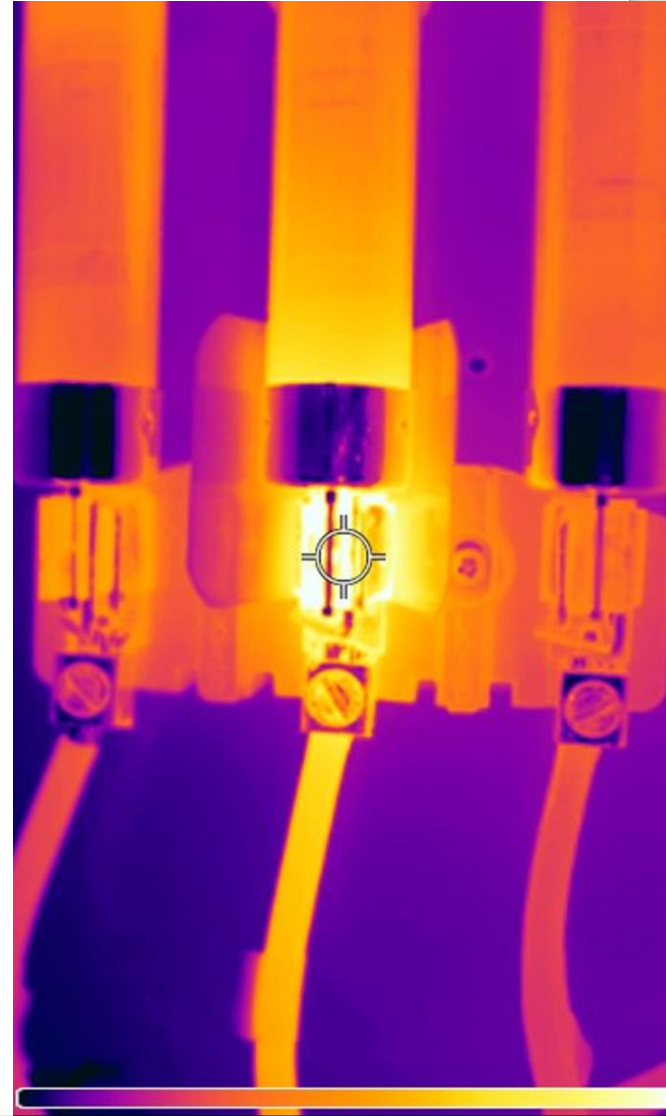
Maintenance (NFPA 70B)

4

**Plan of
Service**

Q: What is going on here? Did we identify risk? Was there risk involved in identifying?

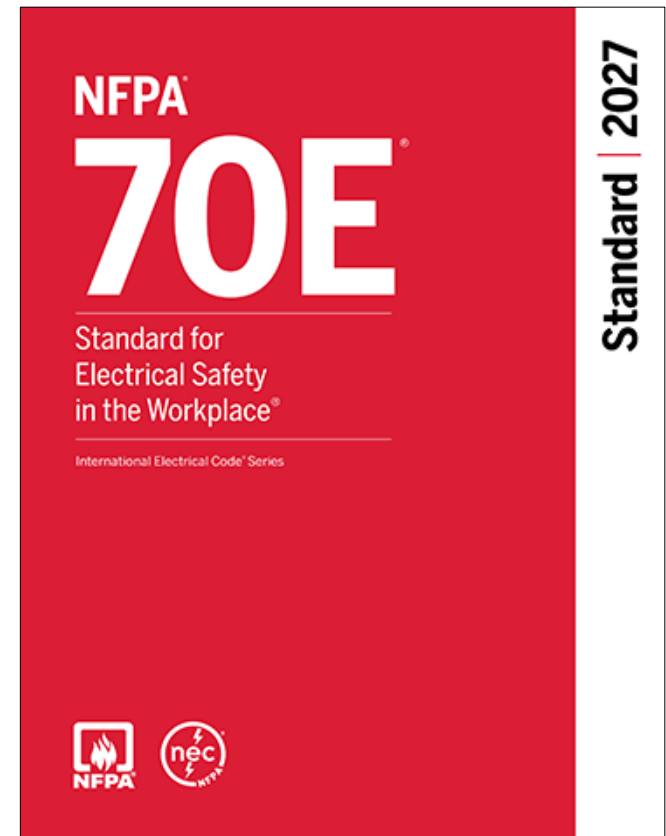
Yes, No, Trick Question?



- NFPA 70B Changes in 2026
 - Detailed guidance on how that EMP must be structured, documented, and maintained over time.
 - System studies must be performed at mandatory intervals of no more than five years.
 - Three-tier condition assessment system (Levels 1, 2, and 3).

Work Practices (NFPA 70E)

- NFPA 70E's purpose
 - Protect workers from electrical hazards—such as electric shock, arc flash, and arc blast.
 - Establishing a structured, set of safe work practices for electrical maintenance, troubleshooting, and energized work.



- Before starting each job that involves exposure to electrical hazards:
 - Complete a job safety plan in accordance with the following
 - Completed by a qualified person (one who performs energized work).
 - Documented.

Work Practices (NFPA 70E)

- Job Safety Plan includes the following:
 - Description of job & tasks.
 - Hazards associated with tasks.
 - Shock risk assessment.
 - Arc flash risk assessment.
 - Work procedures.



Work Practices (NFPA 70E)

TASK=NFPA 70E-Table 130.5(C)

TASK	Equipment Condition	Likelihood of Occurrence
<i>Operation of a CB or switch</i>	<i>Normal</i>	<i>No</i>
<i>Work on energized electrical conductors, including voltage testing</i>	<i>Any</i>	<i>Yes</i>

WARNING

Qualified Persons Only

Arc Flash and Shock Hazards

Appropriate PPE Required

REVIEW SAFE WORK PRACTICES PRIOR TO WORK

8 Cal/cm ²	Arc Flash Protection Boundary Incident Energy @ Working Distance	3 ft 1ft, 6 in
---------------------------------	---	--------------------------

Arc Rated Long Sleeve Shirt rated at ATPV at or above incident energy potentially exposed*
 Arc Rated Long Pants rated at ATPV at or above incident energy potentially exposed*
 Arc Rated Face Shield rated at ATPV at or above incident energy potentially exposed
 Balaclava head sock rated at ATPV at or above incident energy potentially exposed
 Safety Glasses
 Class G or E Hard Hat
 Ear Plugs
 Voltage rated gloves rated above threshold exposed
 Leather Over Gloves
 Leather footwear

480 VAC 00 3 ft 6 in 1ft	Shock Hazard Glove Class Limited Approach Restricted Approach	
--	--	--

VOLTAGE + ARC FLASH=Arc Flash Label

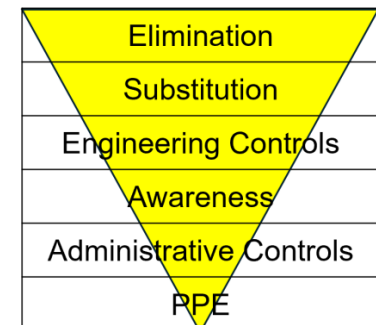
Work Practices (NFPA 70E)

Risk Assessment

Arc flash label indicated energy levels above thresholds.

Likelihood of Occurrence of Harm	Severity of Harm	
	Energy ≤ 1.2 cal/cm ² ≤ 50 V	Energy > 1.2 cal/cm ² > 50 V
No	Low	Medium
Yes	Medium	High

Task table 130.5(C) in NFPA 70E indicated arc flash occurrence is likely.

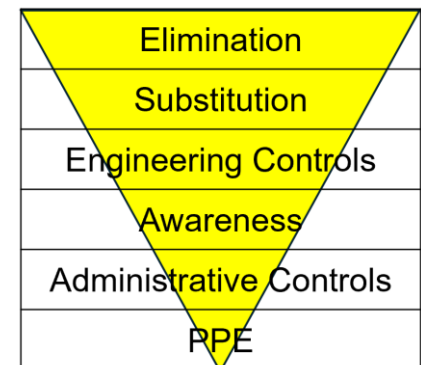


Work Practices (NFPA 70E)

- Acceptable risk for lower level controls include
 - Job safety plan
 - Work permit (if required)
 - PPE
 - Training
 - Programs/SOPs/ECPs



Swiss Cheese Model



- NFPA 70E Changes in 2027
 - Additional Personnel
 - If energized work permit is required.
 - 1 additional person must be present outside arc flash or limited approach boundary, whichever is furthest.
 - **NFPA 70E, Article 130.2(A)(2), page 25**
 - Trained in contact release (emergency response)
 - **NFPA 70E, Article 110.4(C)(1), page 19**

- NFPA 70E Changes in 2027
 - **Expanded Chapter 3 (Safety Requirements for Special Equipment).**
 - **DC and Battery Safety Guidance:** Direct-current (dc) and battery-related requirements.
 - **Hazard Application:** Chapter 3 has been reorganized to better group general hazards, dc hazards, and ac hazards; ac hazards are further separated into sub-RF, RF, and mixed frequencies.

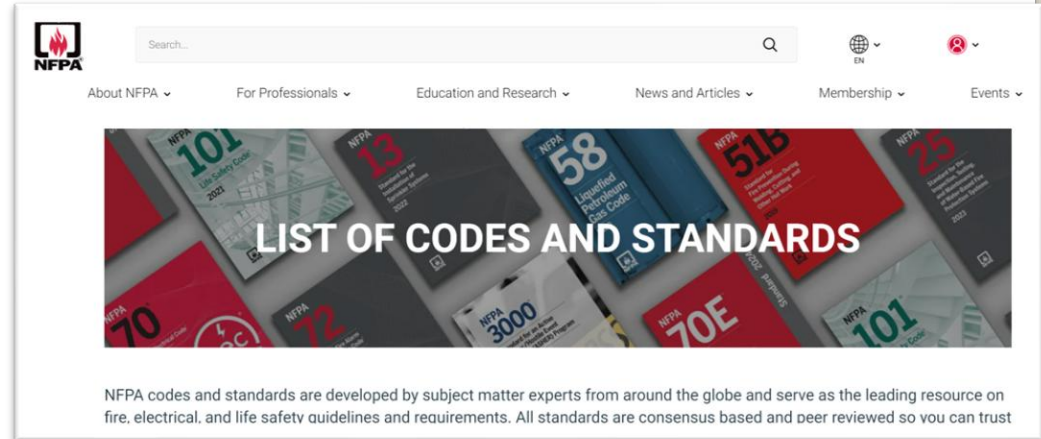
Business Case for Safety

- An effective electrical safety program, along with an electrical maintenance program, will lead to:
 - Higher reliability
 - Longer life of equipment
 - Lower cost than repair
 - Lower insurance costs

Accessing NFPA Codes & Standards

- NFPA standards may be viewed on-line for free, but free access limits download or print of NFPA documents.

Yes No, Trick Question?



- Answer: There are 3 options for access to NFPA standards. Free access only allows you to view standard.

Accessing NFPA Codes & Standards

The screenshot displays the NFPA website interface. At the top, there is a search bar and a navigation menu with links for 'About NFPA', 'For Professionals', 'Education and Research', 'News and Articles', 'Membership', and 'Events'. The main content area features the 'NFPA 70E Standard for Electrical Safety in the Workplace' page. On the left, there is a red cover image of the standard. The main text area includes the title, status (Active), and a description of the standard's purpose. Below the description, there are two buttons: 'Purchase Options' and 'View in NFPA LINK'. An inset image shows the 'NFPA LINK QUICK START GUIDE' dashboard, which provides access to publications, favorite content, and helpful links. A callout box with an arrow pointing to the 'View in NFPA LINK' button states: 'Standards can be viewed free with no option to download or print'.

NFPA 70E
Standard for Electrical Safety in the Workplace®

Status: Active

You are subscribed to notifications. Unsubscribe from notifications for this code.

NFPA 70E requirements for safe work practices to protect personnel by reducing exposure to major electrical hazards. Originally developed at OSHA's request, NFPA 70E helps companies and employees avoid workplace injuries and fatalities due to shock, electrocution, arc flash, and arc blast, and assist in complying with OSHA 1910 Subpart S and OSHA 1926 Subpart K.

Current Edition: 2024

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