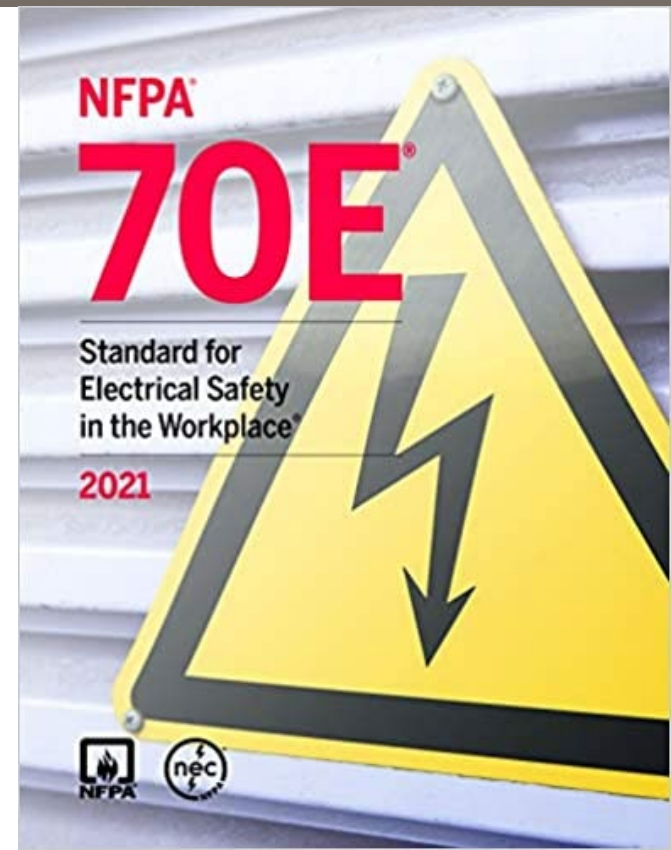


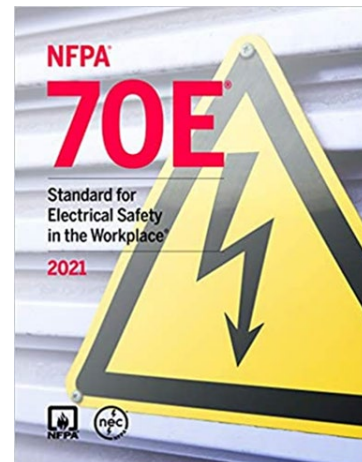
# 2021 NFPA 70 E Updates



# Following Today's Session...

## Everyone will (hopefully) understand:

- the real purpose and focus of NFPA 70E,
- key changes that have taken place for 2021,
- how to use these changes to enhance the electrical safe work practices and programs within their respective facilities.

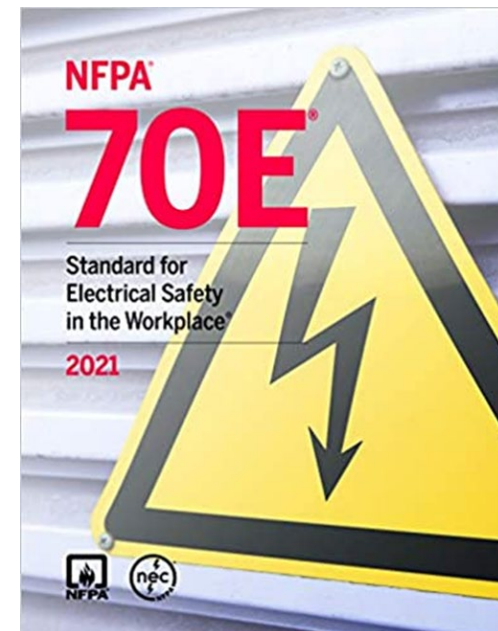
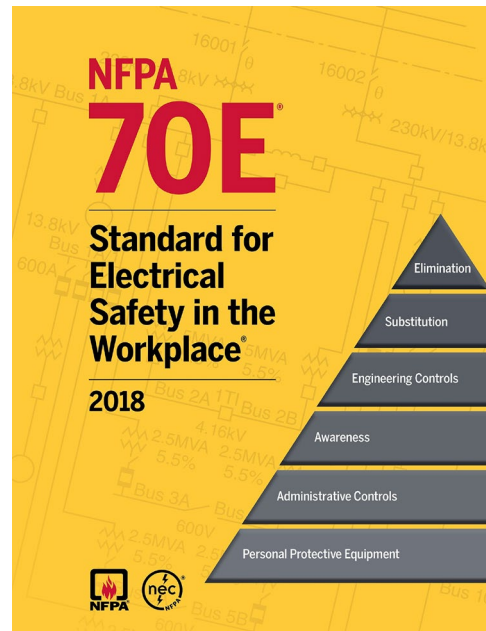
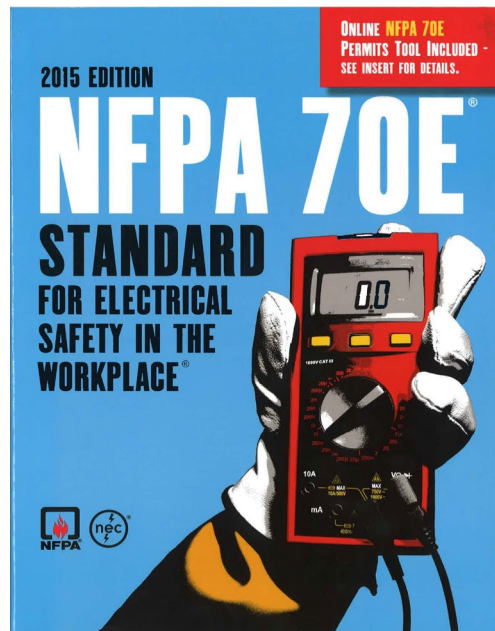


# Read the NFPA 70E Forward...

This standard has been around for quite some time (1979)!

The focus has moved from:

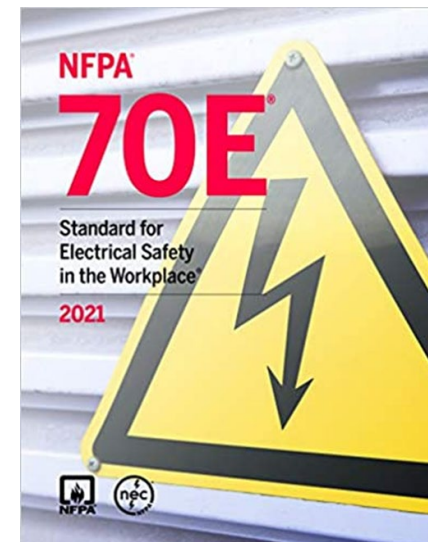
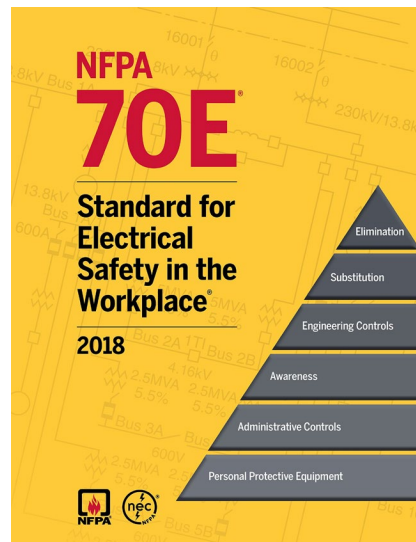
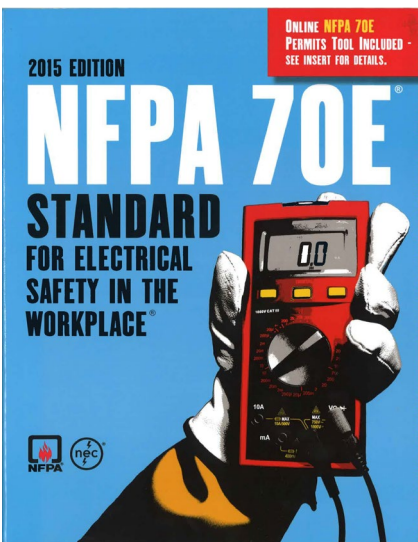
- installation related requirements, to safe work practices.
- P.P.E. to risk assessment and various controls



# Read the NFPA 70E Forward...

The forward also summarizes the primary changes that occur:

1. Article 110 revised to include other general requirements,
2. The term “arc resistant” now being applied to other pieces of equipment,
3. Article 360 and Annex R being added to address working with capacitors,
4. Annex D updated to reference IEEE-1584-2018 (greater accuracy).

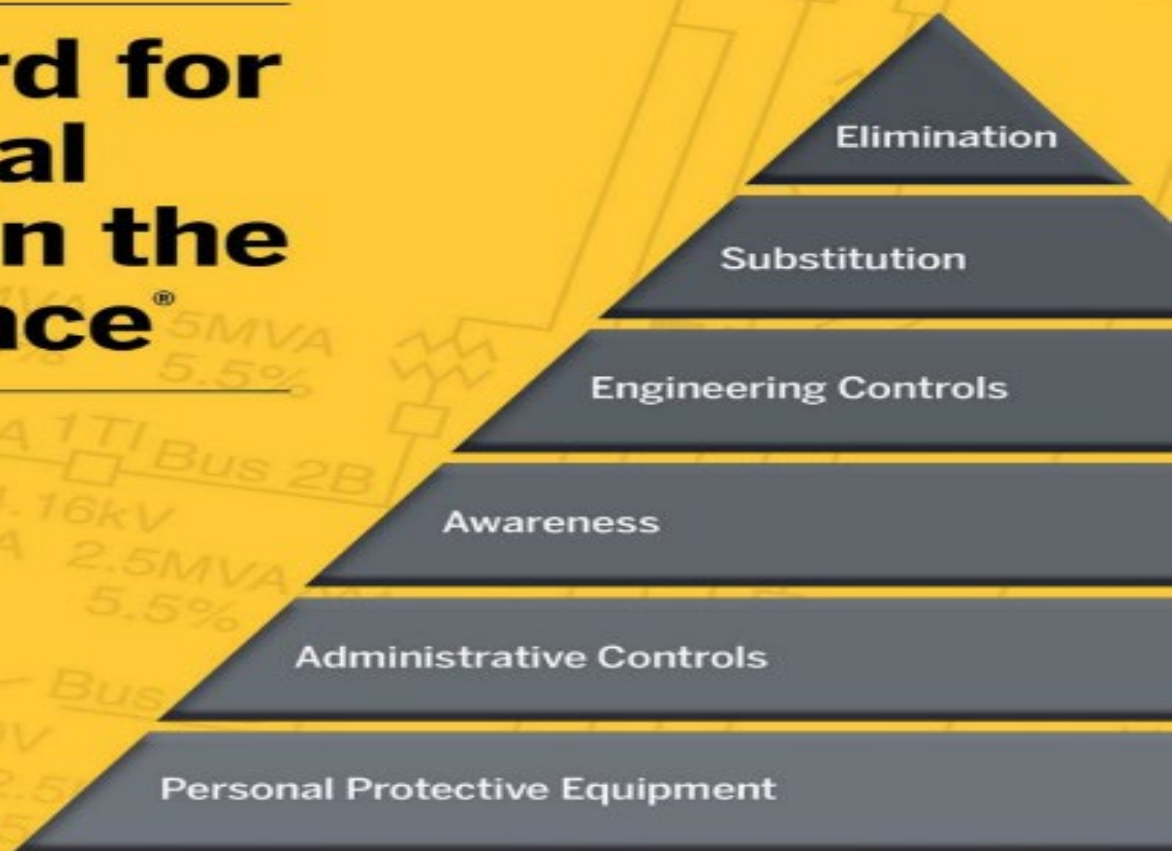




# NFPA 70E<sup>®</sup>

## Standard for Electrical Safety in the Workplace<sup>®</sup>

2018

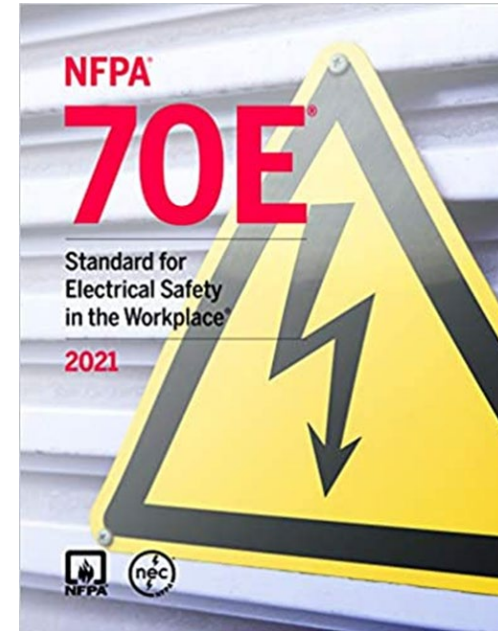
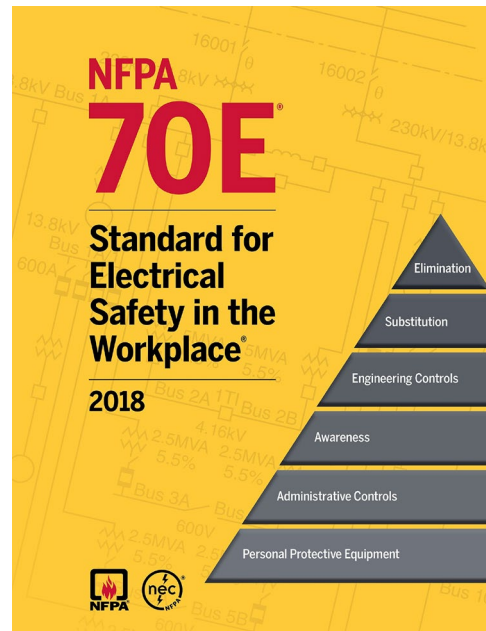
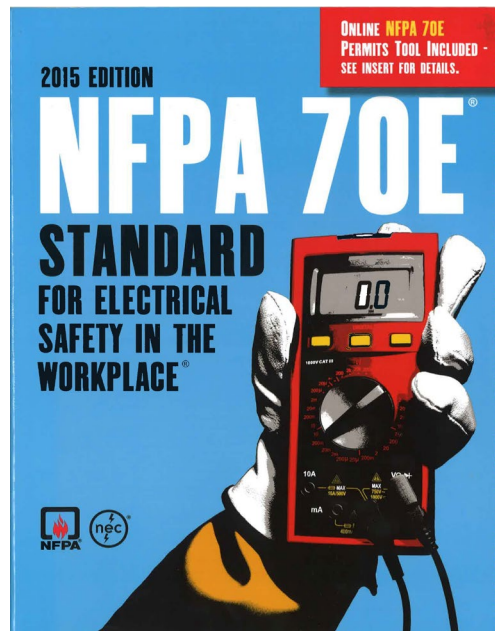


# How Do Updates Occur?

1<sup>st</sup> Draft of 2021 = 332 Public Inputs = 86 First Revisions

2<sup>nd</sup> Draft of 2021 = 115 Public Comments = 43 Second Revisions

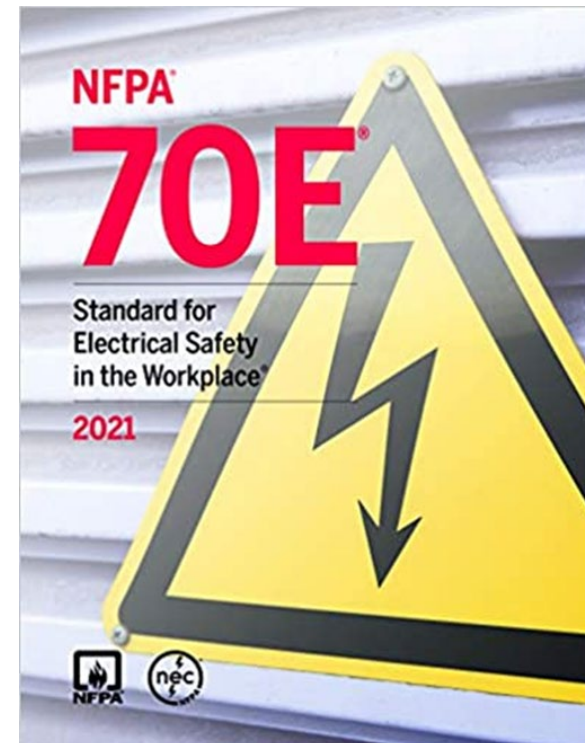
Everyone in the electrical community can contribute to updates!



# Article 100 Definitions...

Some terms were deleted, others were made clearer:

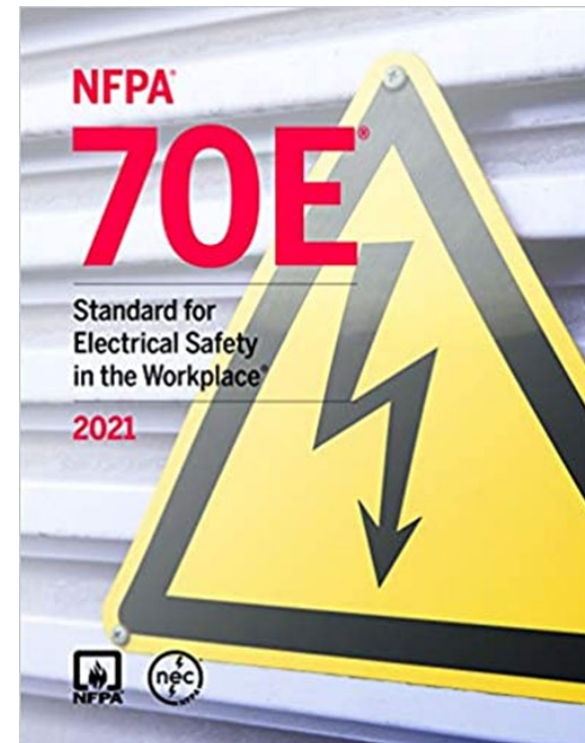
- **Barrier-** a physical obstruction that is intended to prevent contact with equipment or energized electrical conductors and circuit parts **or to prevent unauthorized access to a work area.**



# Article 100 Definitions...

Some terms were deleted, others were made clearer:

- **Electrically Safe Work Condition-** a state wherein all hazardous electrical conductors or circuit parts to which a worker might be exposed are maintained in a deenergized state for the purpose of temporarily eliminating electrical hazards for the period of time for which the state is maintained. (so it's NOT a process)
- Article 120 guides us in establishing an E.S.W.C.

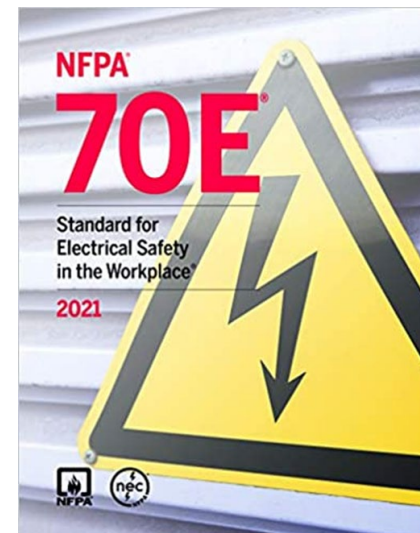




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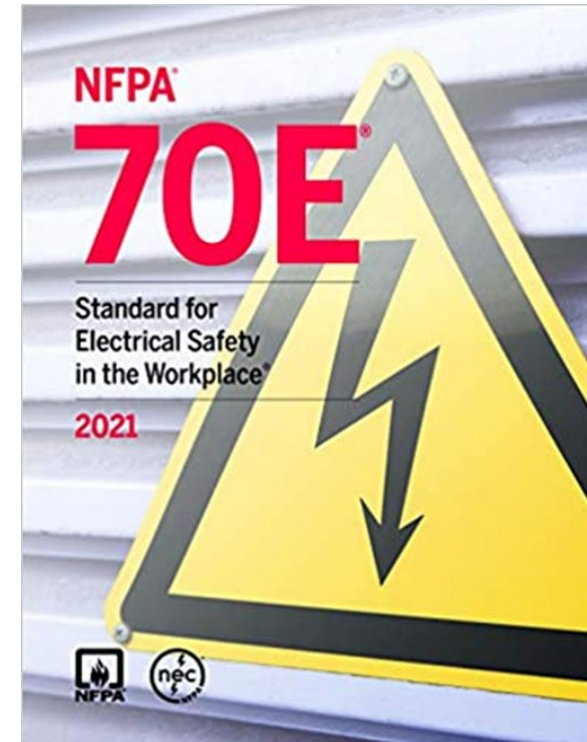
- **Arc Resistant Equipment-** the word “switchgear” was removed, now that many more pieces of equipment, such as motor control centers, meet the definition of “arc resistant”.
- Arc Resistant simply means that IF an arc flash occurs internally on the equipment, the equipment has been designed to contain the arc flash and redirect it to a safer zone of the work area...away from the worker!
- Low voltage MCC's now have venting like switchgear.



# Article 100 Definitions...

Some terms were deleted, others were made clearer:

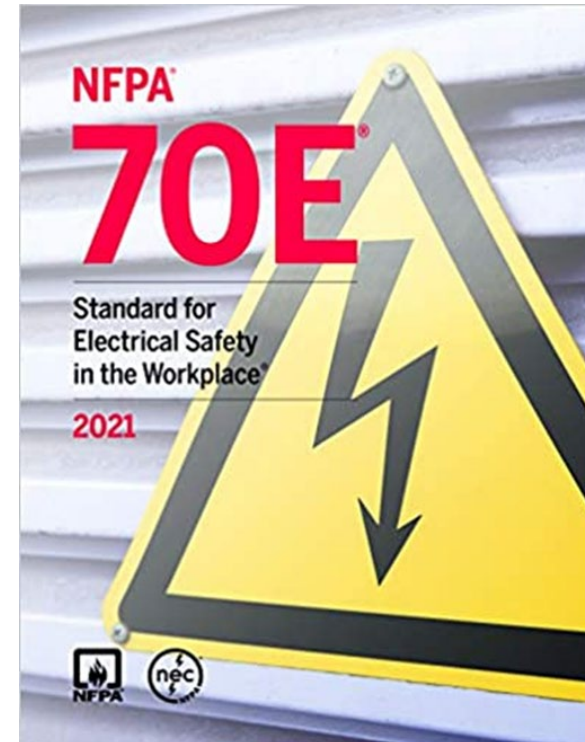
- **Shock Hazard-** a source of possible injury or damage to health associated with current through the body caused by contact or approach to **exposed** energized electrical conductors or circuit parts.
- “Exposed” was added for clarification.
- Better aligns with definition of “exposed”.



# Article 110 Overhaul...

Massive changes occurred in Article 110 for 2021:

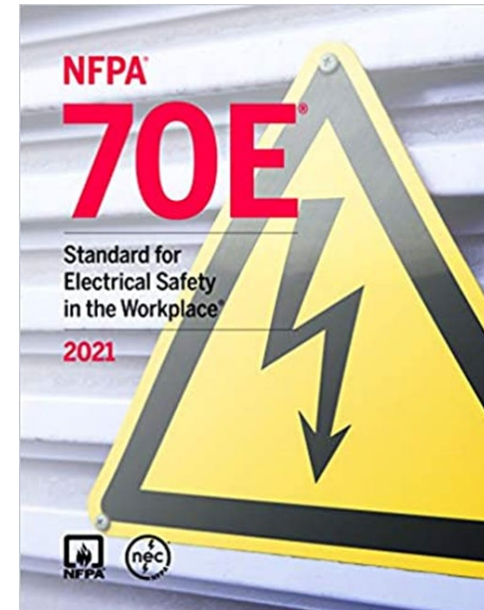
- Portions of Article 120 and 130 were moved to 110 for better alignment, simply because they really applied to “General Requirements”, which was the original intent of Article 110.
- The focus of NFPA 70E is Article 110.1 Priority.
- Note that the priority is still “**hazard elimination**”.
- An informational note directs us to 110.5(H)(3).
- Annex F has examples of hazard elimination.



# Article 110 Overhaul...

Massive changes occurred in Article 110 for 2021:

- 110.5(A) specifically references the requirement for an employer to develop and implement a site-specific Electrical Safety Program.
- New sub-section in 110.5(K), Electrically Safe Work Condition Policy.
- May seem too obvious???
- It's emphasizing the "Electrically Safe Work Condition"!
- It should spell out **HOW** to de-energize and LOTO.

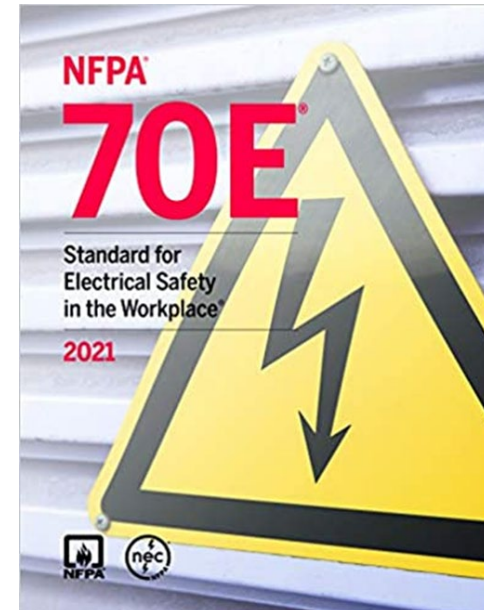




# Article 110 Overhaul...

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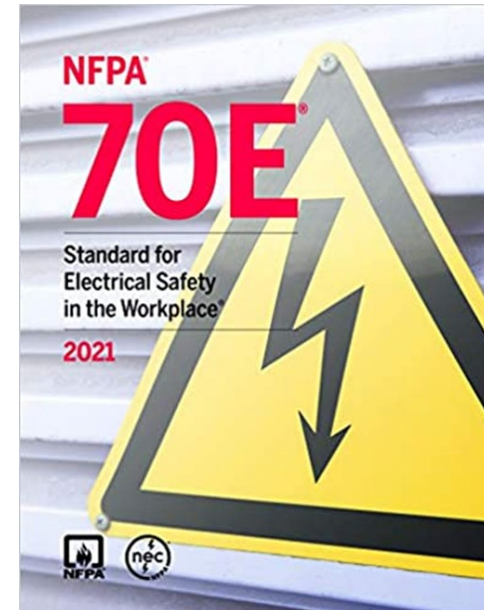
- 110.6(A)(4) now encourages the use of “interactive electronic or interactive web-based training” as a component of classroom training.
- This is a GREAT revision for continuing education!
- Web-based is perfect for theory and definitions.
- Classroom can then be used for application/hands on!
- Blended Learning...which is often the best solution.



# Article 110 Overhaul...

Massive changes occurred in Article 110 for 2021:

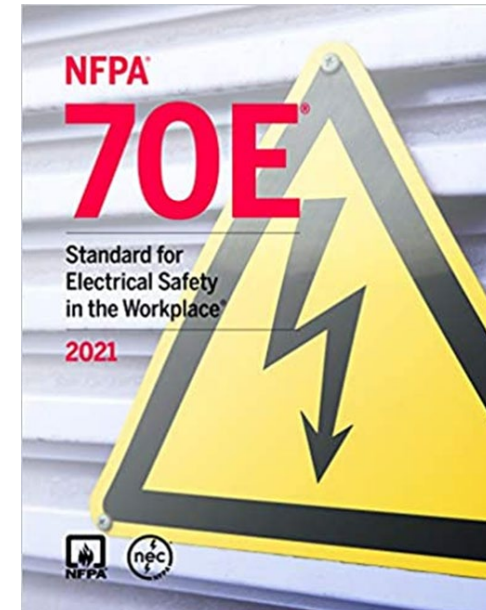
- 110.7(C) new informational note stating that on multi-employer worksites, more than one employer can be responsible for identifying hazardous conditions and creating safe work practices.
- This means that nobody can turn a blind eye on a worksite.
- Emphasizing that safety is everybody's responsibility.
- Highlights need for good communication/cooperation.



# Article 110 Overhaul...

Massive changes occurred in Article 110 for 2021:

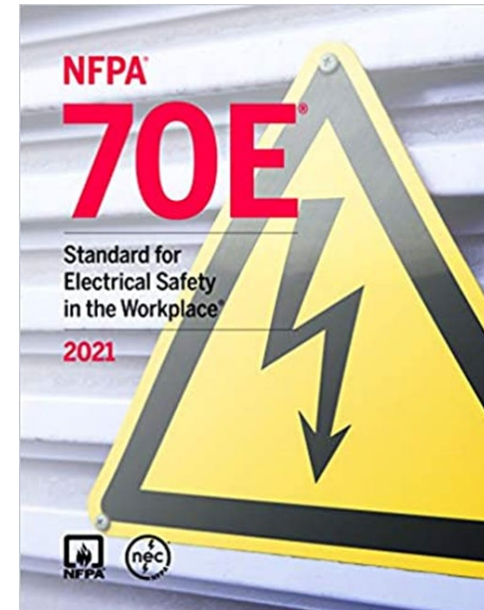
- 110.12 new section on “Equipment Use”, stating that the equipment shall be used in accordance with the manufacturer’s instructions.
- The goal is to eliminate, if possible, the misuse of equipment in applications that it simply wasn’t designed for (using a J-box on an extension cord).



# Article 120 Overhaul...

## Article 120 for 2021:

- 120. 2(B) mentions that the lockout/tagout procedure shall be “developed on the basis of the existing electrical equipment and system and shall use suitable documentation including up to date drawings and diagrams”.
- We need to do a better job of maintaining accurate drawings and diagrams!

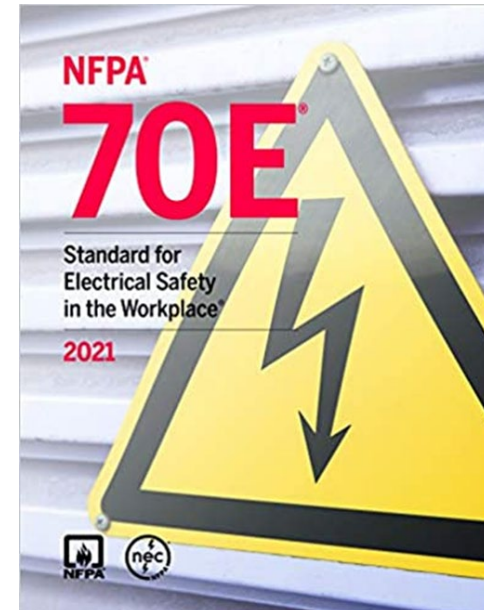




# Article 130 Overhaul...

## 130.5(C) NEW updates on operation of CB or Switch!

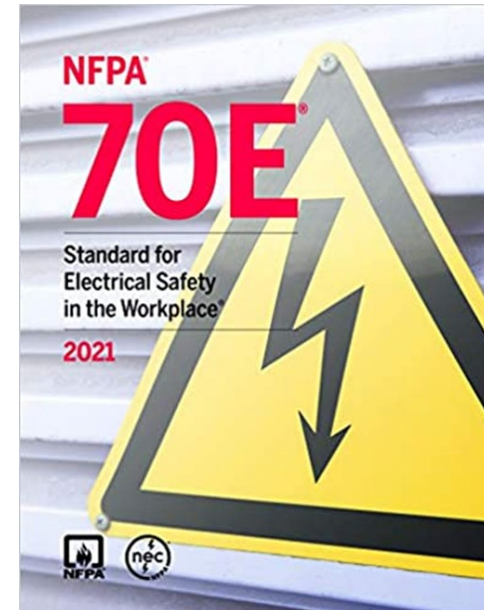
- Under “Task”, it now adds “Operation of a CB or switch the first time after installation or completion of work or maintenance in the equipment”.
- Under “Equipment Condition” it lists “Any”.
- Under “Likelihood of Occurrence” it lists “Yes”.
- 



# Article 130 Overhaul...

## 130.7 NEW PPE updates!

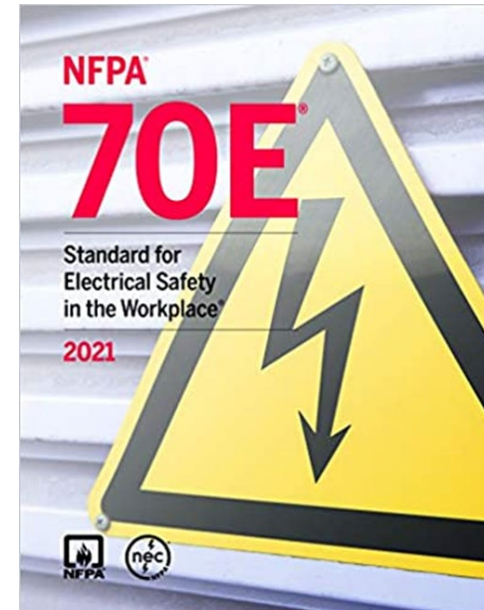
- High Viz apparel was added...must be arc rated, but the cal/cm<sup>2</sup> does not have to be equal to or greater than the estimated incident energy IF it is not a factor for achieving minimum rating.
- So, if I am wearing my 12 cal/cm<sup>2</sup> coveralls for an 8.4cal/cm<sup>2</sup> hazard, I only need an arc rated high viz vest rated at maybe 4cal/cm<sup>2</sup>.
- Remember, layering two 8cal/cm<sup>2</sup> doesn't = 16cal/cm<sup>2</sup>
- Contact manufacturers for layering of garments.



# Article 130 Overhaul...

## 130.7 NEW PPE updates!

- Non-leather footwear is now permitted IF you can ensure they will not ignite, melt or drip at arc rating required for PPE.
- So essentially, you would need to prove via ASTM testing from the manufacturer that the non-leather footwear meets the requirements.
- Otherwise, just wear proven leather boots/shoes.

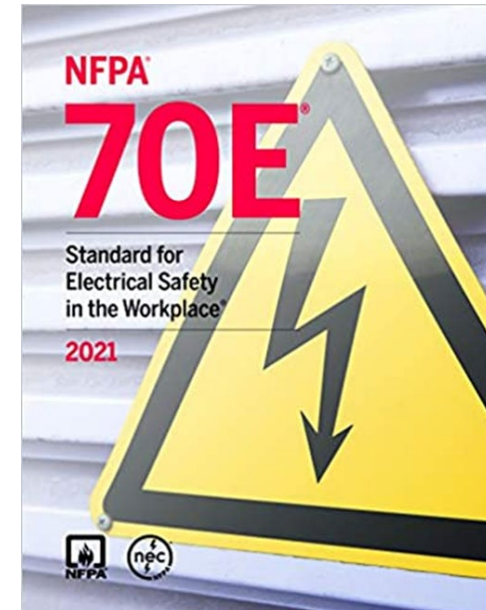


# Article 130 Overhaul...

130.7 NEW PPE updates!

Maximum Use Voltage Chart for Gloves was added.

<u>Class</u>	<u>Maximum ACV</u>	<u>Maximum DCV</u>
00	500	750
0	1000	1500
1	7500	11,250
2	17,000	25,500
3	26,500	39,750
4	36,000	54,000

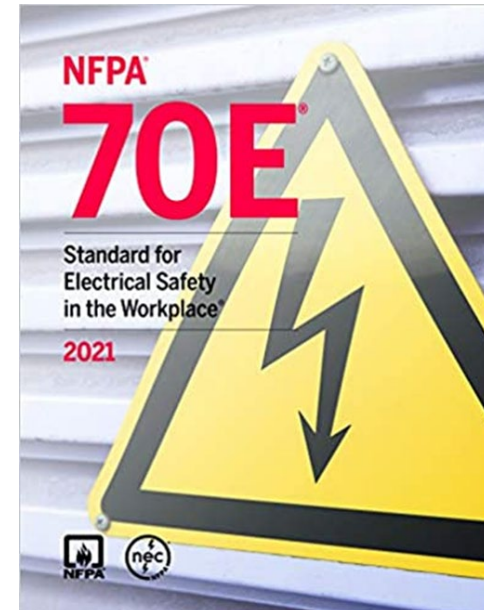




# Article 130 Overhaul...

## 130.7 NEW PPE updates!

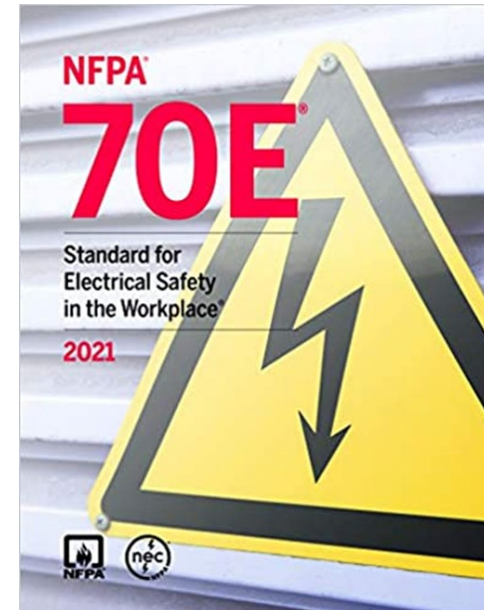
- Table 130.7(G) adds Arc Protective Blankets selection, care, and use info.



# Article 360 Addition...

## Article 360 NEW for Capacitors!

- adds safety related work requirements for capacitors.
- Annex R covers many details (17 pages) related to such work.
- First, effectively guarding capacitors from inadvertent contact.
- Second, determine discharge time for capacitor.
- Industry best practice is waiting at least 5 minutes.



# QUESTIONS?

