

# **WARNING**

Arc Flash and Shock Hazard Present  
Appropriate PPE Required

Arc Flash Boundary	0.6	
Incident Energy in cal/cm <sup>2</sup>	0.2	
Working Distance	18	Minimum PPE
Shock Hazard Exposure	208	Non-melting or un
Insulating Gloves Class	00	long-sleeve shirt a
Shock Hazard when covers removed		

0.0 ft  
0ft  
1ft

## Arc Flash Studies for the UL Market

# Disclaimer

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The typical circuit diagrams and interpretations of the standard are not binding and do not claim to be complete regarding configuration, equipment or any other eventuality. They are not customer-specific solutions and are only intended to provide assistance with typical tasks.

Each user of this presentation is responsible for correct operation of the products described. This presentation does not relieve you of the responsibility for safe handling when using, installing, operating and maintaining equipment.

When writing these guidelines, many tables and texts were taken directly from the relevant standards. Therefore it is always important to check whether the cited passages are still up to date. The final declaration as to whether an application complies with the valid standards must be made by the user of this documentation.

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# Arc flash hazards

## Disturbing facts

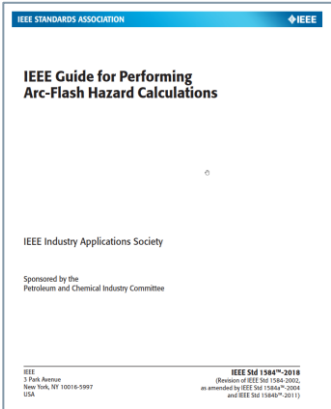
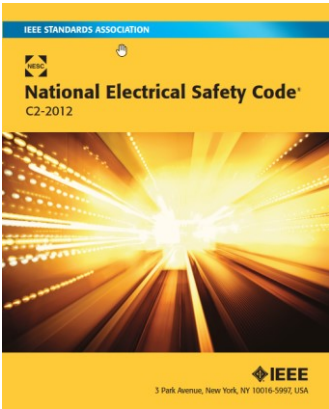


- **80% of all electrical injuries** are consequences of an **arc flash**
- In many cases these are related to **work inappropriately performed on energized equipment**
- Many injured individuals have had **insufficient training** and/or failed to use **appropriate personal protective equipment**

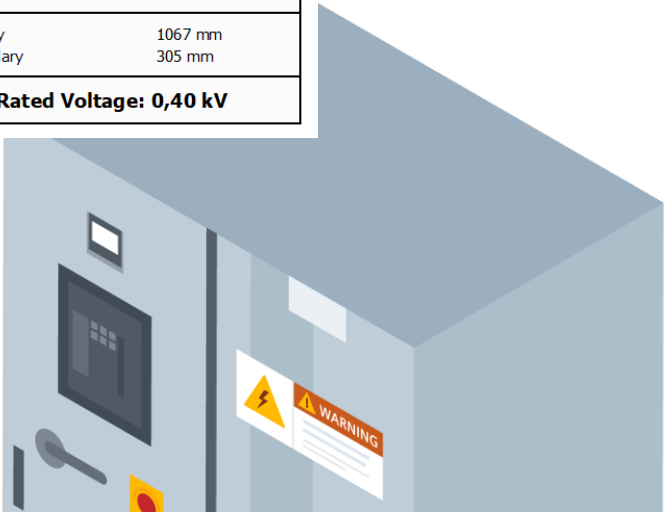
Source: <https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/Electrical/RFArcFlashOccData.ashx?la=en>

# NEC requires marking for machines, substation cubicles and control cabins in USA

A **warning label** has to indicate that death or serious injury may result from arc flash events when working on or near energized equipment (e.g. maintenance, commissioning)

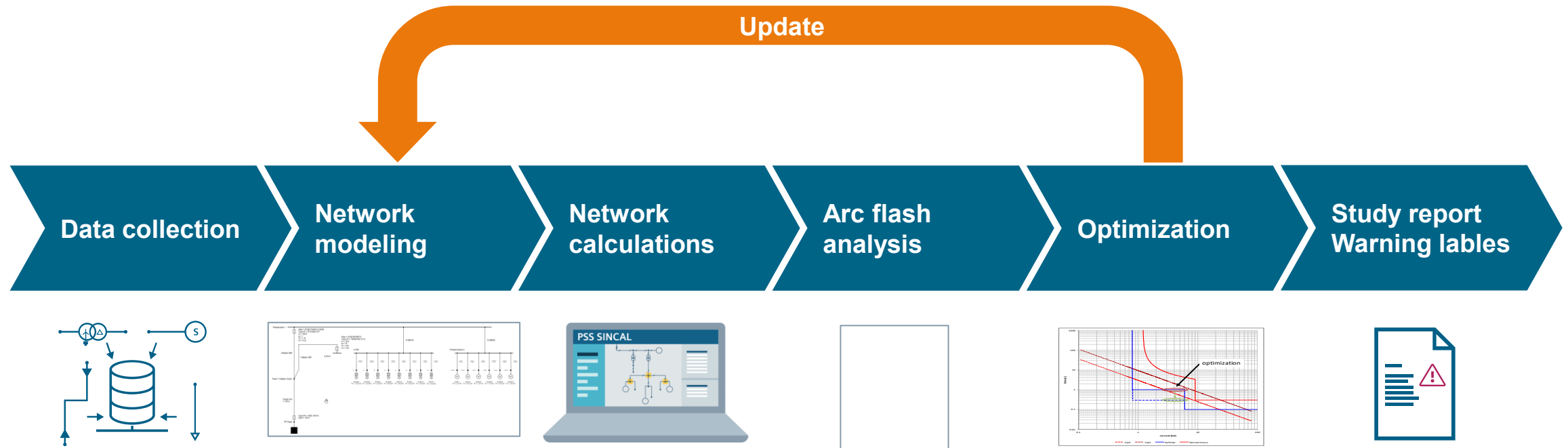


<b>WARNING</b>	
<b>Arc Flash and Shock Hazard Appropriate PPE Required</b>	
Arc Flash Boundary	1140 mm
Incident Energy	10,3 cal/cm <sup>2</sup>
Working Distance	457 mm
PPE based on latest edition of NFPA 70E	
Limited Approach Boundary	1067 mm
Restricted Approach Boundary	305 mm
<b>Bus: MCC01, Rated Voltage: 0,40 kV</b>	



# Arc flash study according to IEEE 1584 and NFPA 70E

## Typical project steps and results



# Arc flash studies

## Mitigation and optimization measures

**Cabinet layout / Selection of components**  
**Protection devices / Settings**

PPE-Level

high

low





# Our control panel website – Expert know-how



- Whitepaper
- References: Control panels compliant with IEC, UL/CSA standards
- Practical tips and tricks for control panel engineering (including tips for US and Canada)
- Configuration manuals
- Assistance with verification
- Web-based training/webinars

Market portal for control panel building: [www.siemens.com/controlpanel](http://www.siemens.com/controlpanel)

Topic page for North America: [www.siemens.com/controlpanel/northamerican-standards](http://www.siemens.com/controlpanel/northamerican-standards)

# Any questions?

