



Short Circuit Current Rating (SCCR)

Kansas Safety and Health Conference
2022

Presented by: Steve Reed

kasa

kasa companies



Automation Integrator

- Electrical Schematics/Panels
- PLC & HMI Programming
- Startup & Commissioning



Turnkey Paint Finishing System Provider

- Liquid & Powder Paint
- Modular & Flexible Layouts



Material Handling Integrator

- Customizable System Design
- Shipping/e-Commerce Customers

SCCR: What does it mean?



**Oh joy!
Another
PowerPoint
presentation.**

SCCR: What does it mean?

- Available Fault Current (AFC or AFI)
 - Short Circuit Current Rating (SCCR)
 - Arc Flash incident
 - How to avoid Arc Flash incidents

SCCR: What does it mean?

- What is electricity and how does it “flow”?



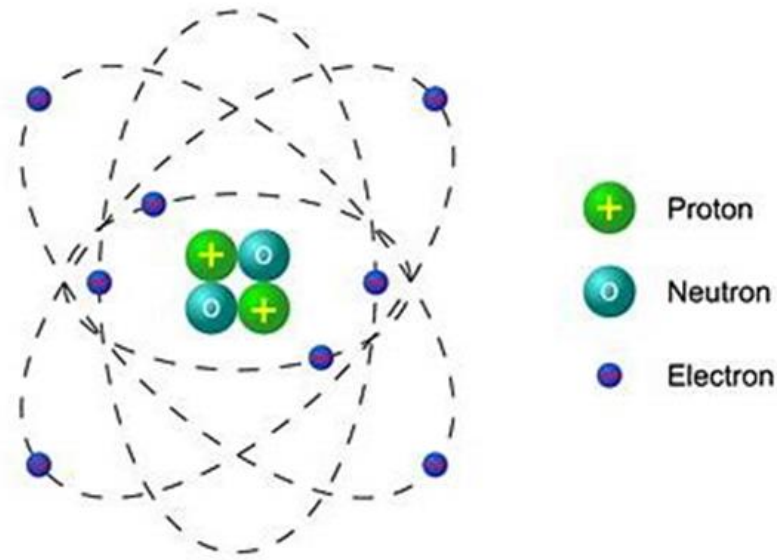
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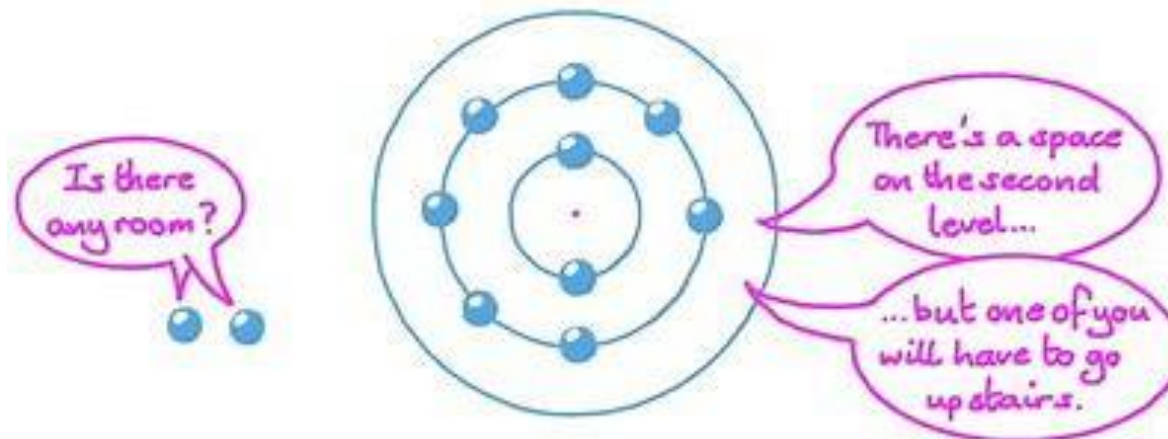
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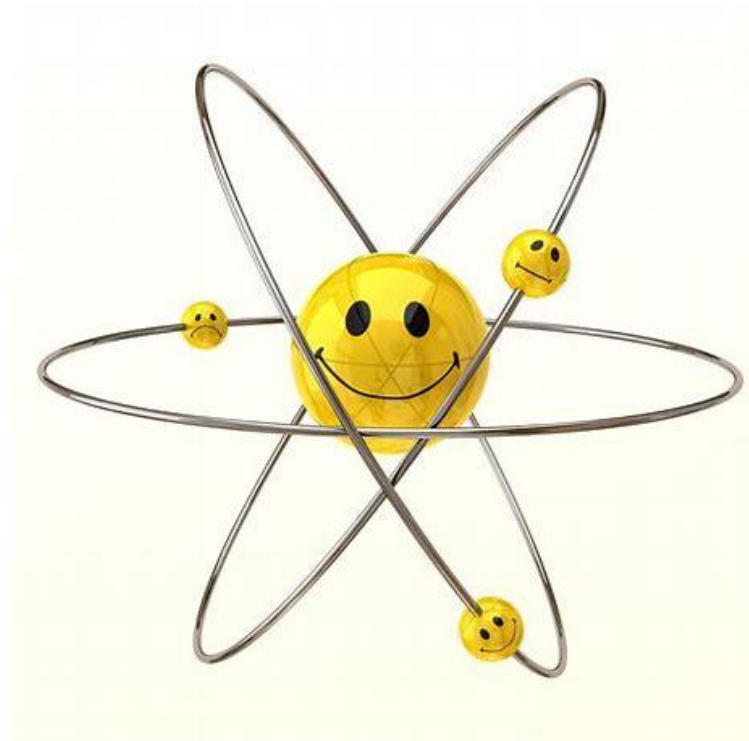
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ELECTRON SHELLS



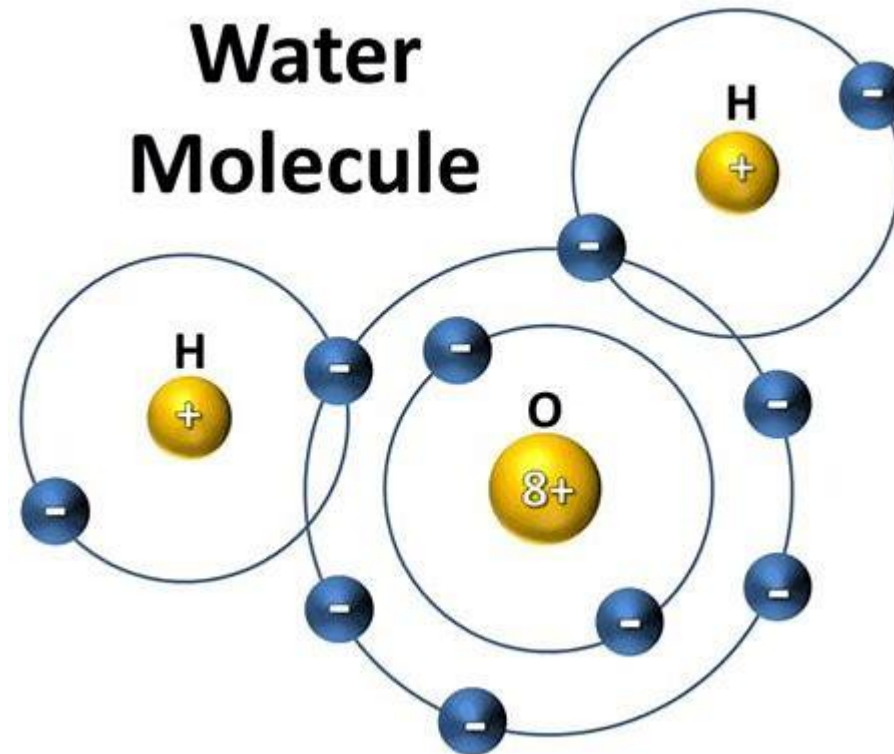
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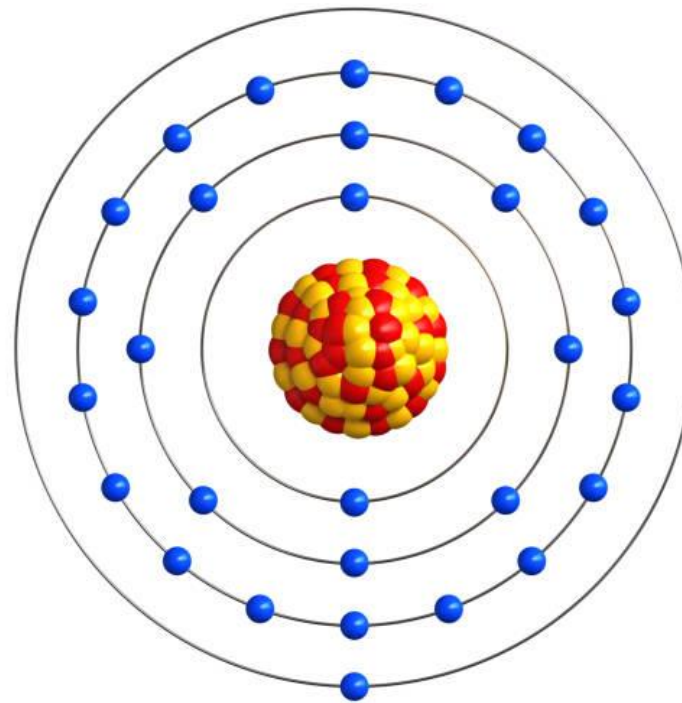
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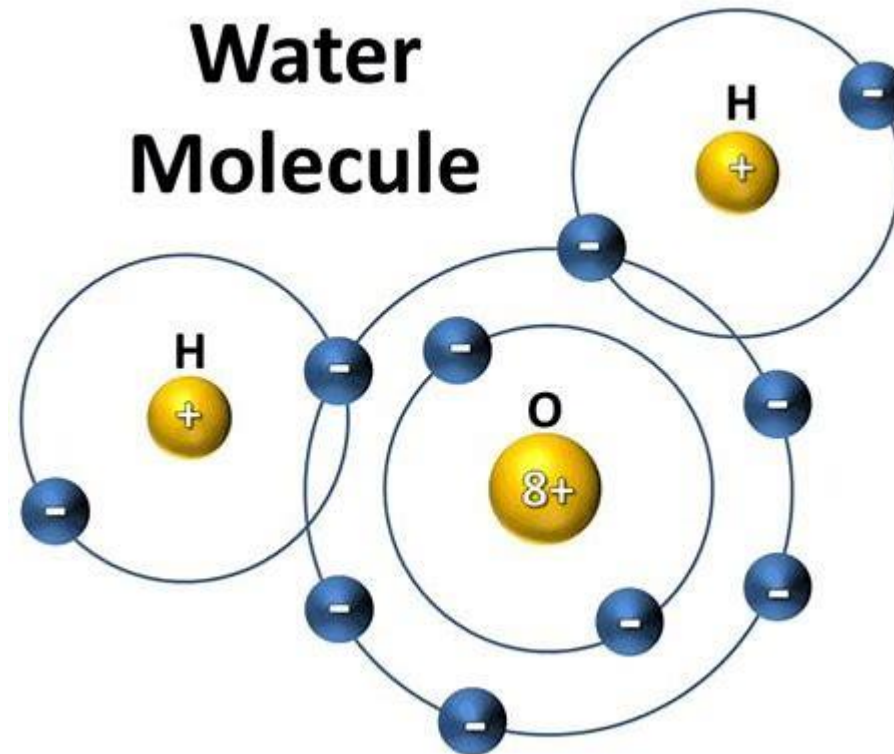
Copper



● 29 Protons ● 35 Neutrons ● 29 Electrons

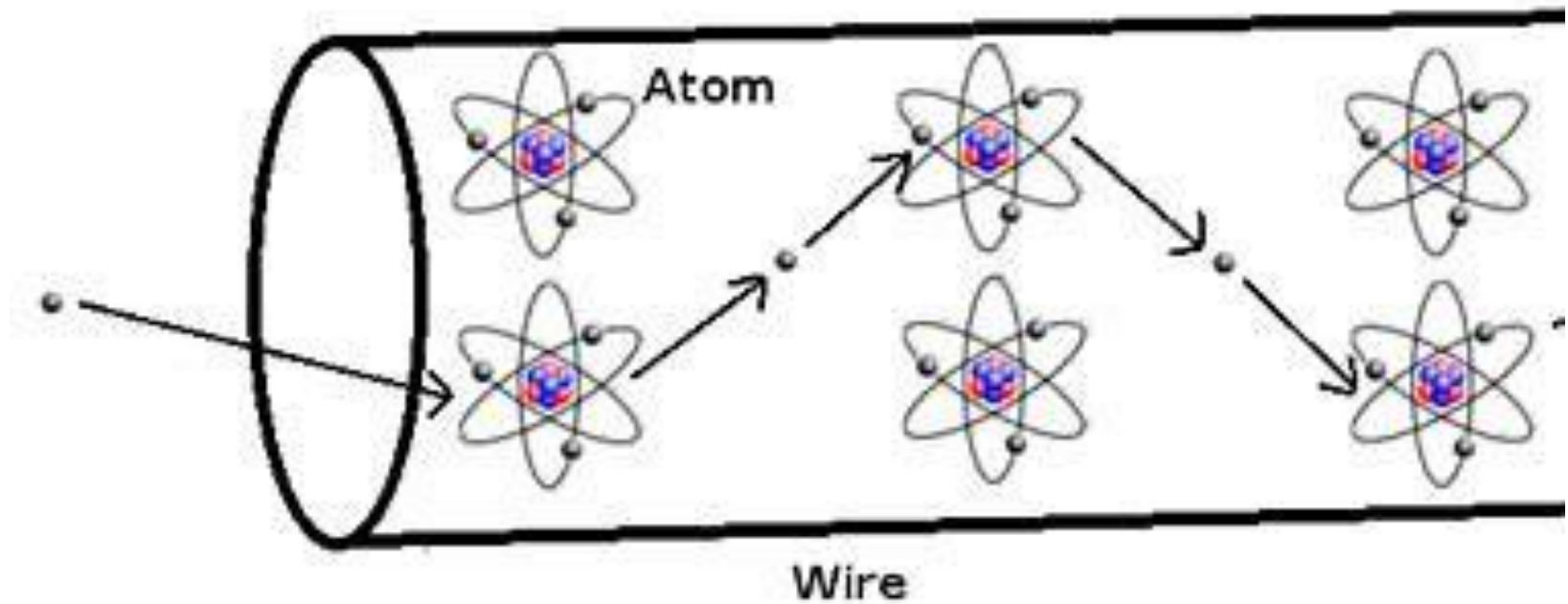
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SCCR: What does it mean?

Questions on how Current flows?

SCCR: What does it mean?

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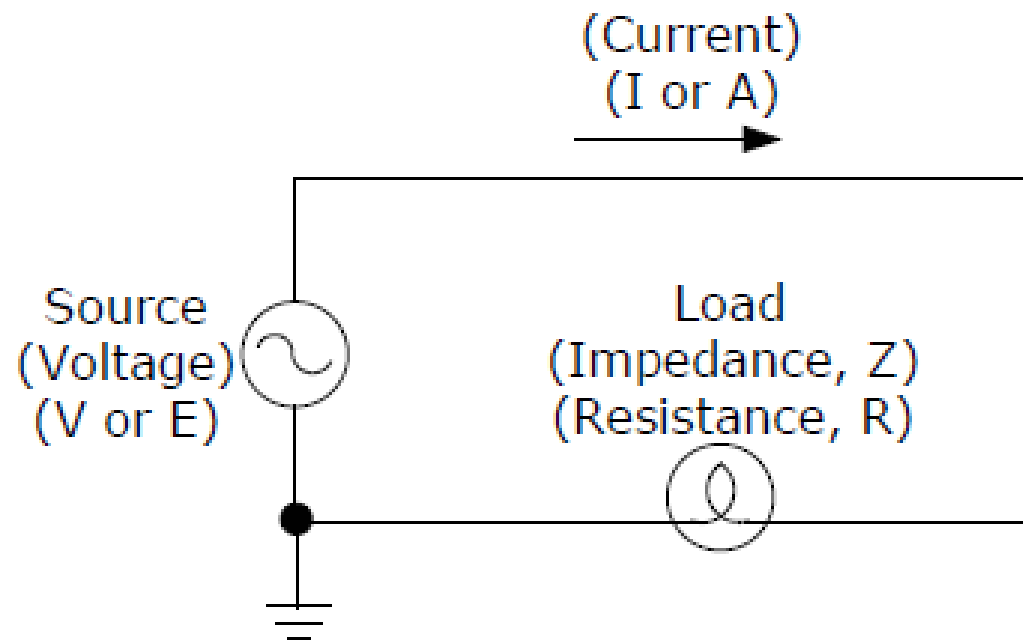
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SCCR: What does it mean?

This is "Available Fault Current" (AFC or AFI)



SCCR: What does it mean?

This is an "Arc Flash incident"



SCCR: What does it mean?

What is the Short Circuit Current Rating (SCCR) of this tree?



SCCR: What does it mean?

What is the Short Circuit Current Rating (SCCR) of this tree?

Answer:

Less than the Available Fault Current (AFC), Resulting in an Arc Flash incident!



SCCR: What does it mean?

What is the “Short Circuit Current Rating” of this dam?



SCCR: What does it mean?

- Available Fault Current (AFC or AFI)
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SCCR: What does it mean?

How to avoid Arc Flash incidents?

SCCR: What does it mean?

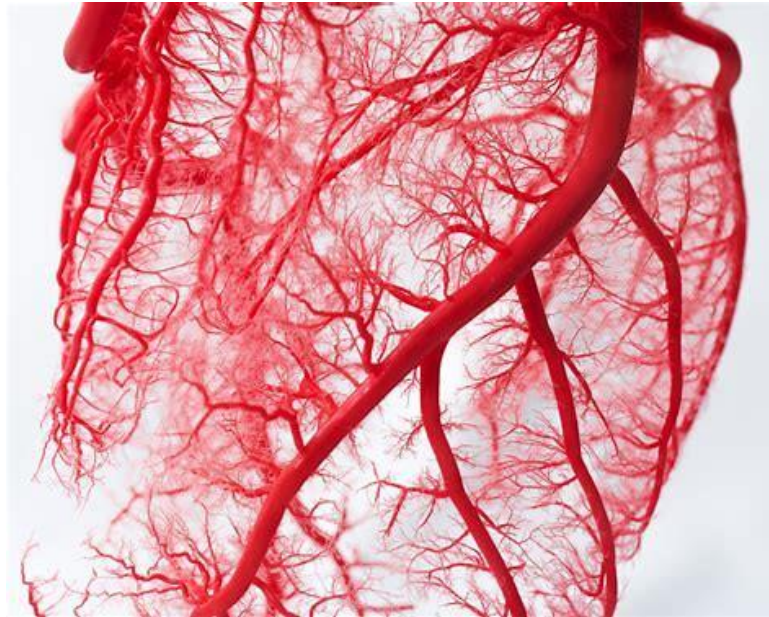
Step 1: Figure out your available fault current.

Only then will you know what hazards you are dealing with.

How big does your dam need to be?

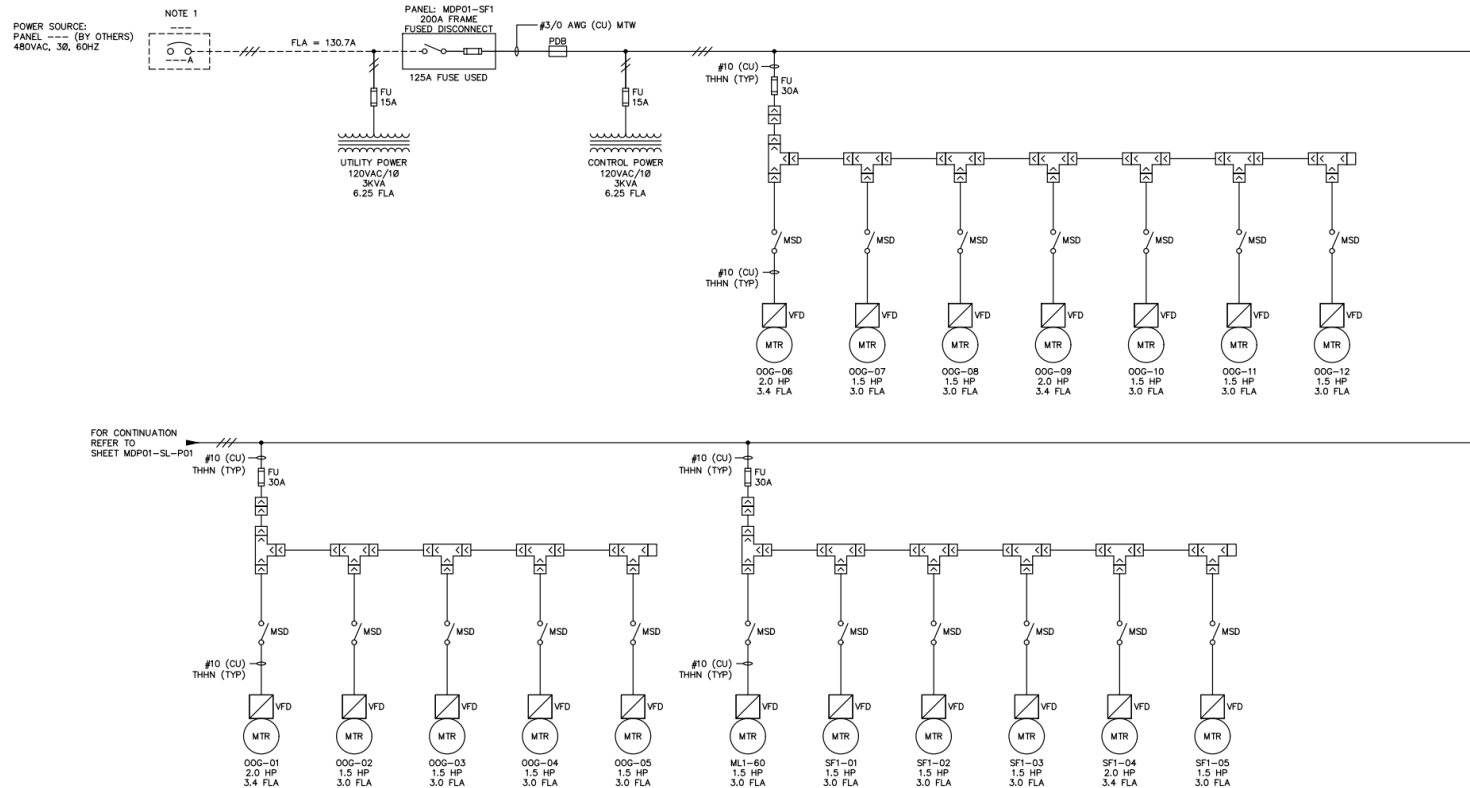
SCCR: What does it mean?

The Available Fault Current is different at different locations within your facility.



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The Available Fault Current is different at different locations within your facility.



SCCR: What does it mean?

Step 2: Strategically restrict current flow.

What does this look like?

SCCR: What does it mean?

How do we restrict current flow?



SCCR: What does it mean?

How do we restrict current flow?

Answer:
"Current limiting"
Over Current
Protection Device
(OCPD)

Fuses and Circuit Breakers



SCCR: What does it mean?

How do we restrict current flow?



Answer:
Transformers

"Resist" rapid current flow

SCCR: What does it mean?

Step 3: Design your equipment to be able to “withstand” the available fault current.

Design for the “worst case” current.

SCCR: What does it mean?

Step 3: Design your equipment to be able to “withstand” the available fault current.

Your lowest rated device might be your SCCR.

SCCR: What does it mean?



SCCR: What does it mean?

NFPA 70, National Electrical Code (NEC)

Installation

Normal conditions

NFPA 70E, Standard for Electrical Safety in the Workplace

Maintenance

Abnormal conditions

In conjunction with 1910.147 Control of Hazardous Energy

SCCR: What does it mean?

NFPA 70: 409.110 Industrial Control Panels, Marking.

An industrial control panel shall be marked with the following information that is plainly visible after installation:
(4) Short-circuit current rating of the industrial control panel.....

SCCR: What does it mean?

NFPA 70: 409.22 Industrial Control Panels, SCCR.

(A) An industrial control panel shall not be installed where the available short-circuit current exceeds its short-circuit current rating as marked in accordance with 409.110 (4).

SCCR: What does it mean?

NFPA 70: 670.3 Industrial Machinery, Marking.

...shall have permanent nameplate attached... including Short-circuit current rating of the machine industrial control panel...

SCCR: What does it mean?

NFPA 70: 670.5 Industrial Machinery, SCCR.

(1) Industrial machinery shall not be installed where the available short-circuit current exceeds its short-circuit current rating as marked in accordance with 670.3(A)(4).

SCCR: What does it mean?

UL 508A, Supplement SB:

Approved method for determining Short Circuit Current Rating for Industrial Control Panels.

SCCR: What does it mean?

NFPA 70E:

Article 110: General Requirements for Electrical Safety-Related Work Practices.

Article 120: Establishing an Electrically Safe Work Condition

Article 130: Work Involving Electrical Hazards



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