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Arc-Flash Hazard Assessment & Reduction

Arc-Flash Hazard

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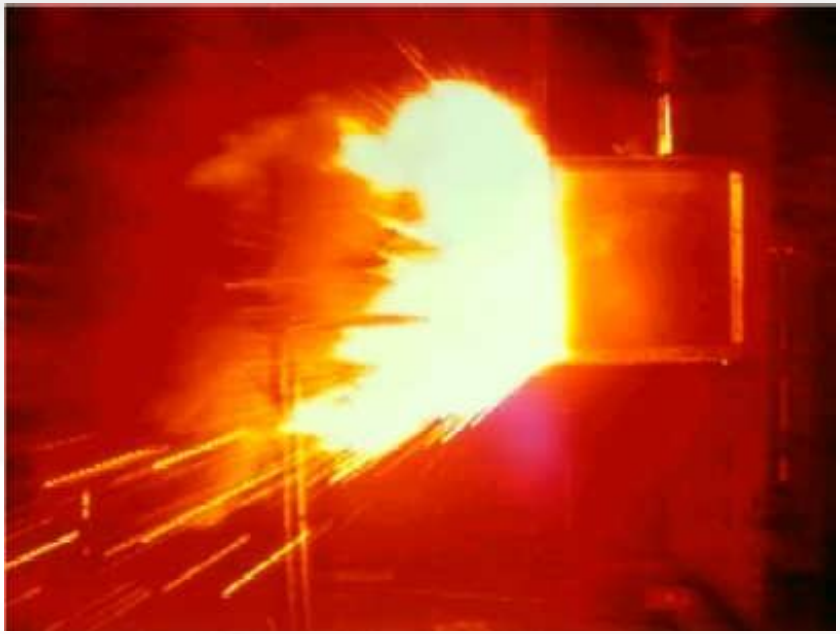
- What is it ?
- Why is it an issue now?
- Where do I need to deal with it?
- When do I have to deal with it?
- How do I go about dealing with it?

Arc-Flash Hazard. What is it?

- Flash Hazard –
  - A dangerous condition associated with the release of energy caused by an electric arc.



Arc-Flash Hazard. What causes it?

- Work in close proximity to live equipment
- A mistake
- A slip
- Dust

Arc-Flash Hazard. What does it do?

- It hurts !!
- It hurts !!!
- It injures !!!!
- It kills !!!!!

Why is it an issue?

- People are getting hurt!
  - The utility system is getting bigger
  - Higher fault current available
  - We are more aware of the causes
  - And we can do something about it

Why is it an issue now?

- It has recently been put into the Canadian Electrical Code
  - Section 2-306
    - (1) Electrical equipment such as switchboards….that are installed in other than dwelling units and are likely to require …. maintenance while energized **shall** be field marked to warn persons of potential electric shock and arc flash hazards.

Where do I need to deal with it?

- (1) Electrical equipment such as switchboards….that are installed in other than dwelling units and are likely to require …. maintenance while energized
- Everywhere but home

When?

- Soon.
  - How many more people will get hurt.

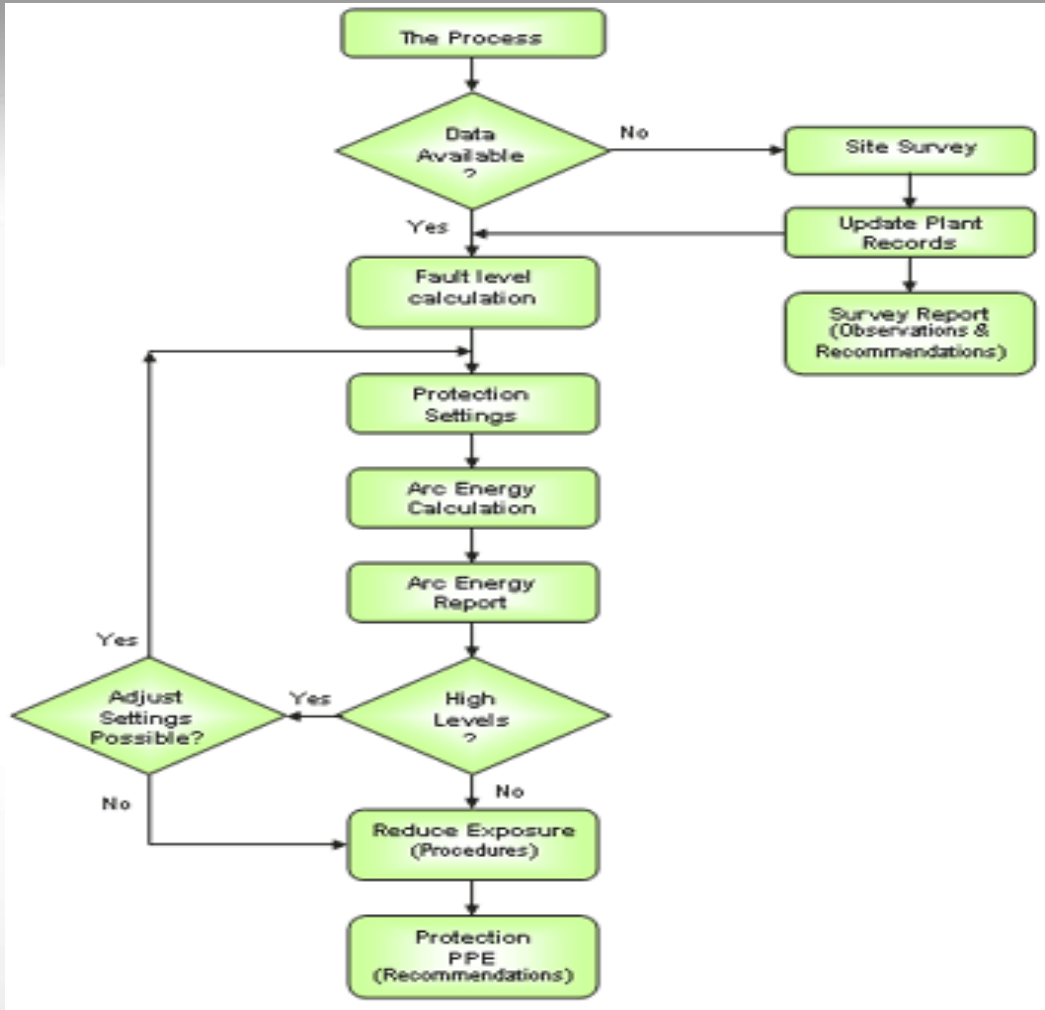
What can I do about it?

- NFPA 70E identifies PPE, procedures and limits
- ANSI Z535.4 identifies the labels
- IEEE 1584 identifies the way to calculate the energy

What can I do about it?

- Get a study done to identify the
  - Available fault levels
  - Available incident energy
  - The required PPE
  - My options

What can I do about it?



Initial Assessment

- Gather field data
  - Motor nameplates
  - Cable sizes and lengths
  - Switchgear and MCC's data
    - Current rating
    - Voltage rating
    - Bus Bracing

Initial Assessment

- Gather field data
  - Relaying
    - CT ratios
    - Relay settings
  - Fuse Data
  - Circuit Breaker Data
  - Generator Nameplates
  - Transformer Data
  - Utility Data

System Modeling & Analysis

- Short Circuit Analysis
- Device Co-ordination
- Arc-Flash Hazard Analysis

System Modeling & Analysis

- Scenarios
  - Reduce hazards
  - Reduce costly PPE

Example

- Change the fuse type

Minimize Incident Energy

- Calculate incident energy for each bus to
  - Identify proper PPE
  - Generate Arc-Flash Warning Labels

Report

- Identify all areas of concern
- Identify recommended changes to mitigate hazards
- Identify PPE required
- Build labels

Sample Arc-Flash Hazard Warning Label

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