



ARC FLASH ANALYSIS/STUDY SHORT CIRCUIT STUDY TRAINING

March 11-12, 2020 - Mississauga, ON

March 22-23, 2020 - Calgary, AB

April 22--23, 2020 - Richmond, BC

**2-DAY
COURSE \$899**

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ARC FLASH ANALYSIS IS COMMONLY KNOWN AS AN ELECTRICAL ENGINEERING "ARC FLASH STUDY" OR "SHORT CIRCUIT STUDY" THAT ALLOWS COMMERCIAL AND INDUSTRIAL BUILDINGS AND INDUSTRIAL FACILITIES TO FULFILL OSHA 1910 132(D) AND CSA Z462/NFPA 70E REQUIREMENTS FOR DETERMINING THE POTENTIAL FOR WORKPLACE ARC FLASH

Electrical safety is the focus of this 2-day course. First, you will learn to identify requirements and responsibilities from safety standards and codes (CSA Z462, NFPA 70e, IEEE 1584, NESC 410A). Next, you will examine methods for identifying and calculating arc flash hazards. Finally, we will analyze equipment selection and operational strategies to reduce risks.

UPDATE: IEEE-1584-2018, IEEE Guide for Performing Arc Flash Hazard Calculations, was just released with the document's first update in 16 years! In this course, we will also look at the impact the new release will have on those using IEEE-1584 to perform hazard calculations.

An arc flash analysis study is usually performed through the collection of data from existing electrical equipment and systems, followed by the proper calculation of arc flash hazards and requirements by an experienced electrical engineer. This can be done using either the manual method using IEEE 1584 calculations or using popular arc flash study/short circuit study analysis software.

An effective arc flash analysis training program should provide electrical engineers with the knowledge and understanding of how to perform such an analysis/study.

CSA Z462 Standard for Electrical Safety in the Workplace specifies that arc flash hazard analysis shall be updated whenever there is a major modification or renovation to the electrical system (e.g., changing a feed or adding large motors). Even in the absence of such changes, CSA Z462 still mandates reviewing the arc flash study a maximum of every five years to account for the many little changes that can have a big impact on study results.

"Retraining" in NFPA 70E/CSA Z462

Like as in the case of the arc flash analysis study, proper training of qualified electrical workers in NFPA 70E/CSA Z462 is not a one time event. Workers leave; new ones are added; people simply forget what they have learned.

CSA Z462 specifies additional as-needed worker training under certain conditions, but it also mandates retraining all qualified workers at an interval not to exceed three years. Some companies have adopted a yearly retraining policy, due to the importance of the CSA Z462 electrical safety concepts.

Who Needs Arc Flash Analysis Training?

Most commercial, institutional, and industrial electrical systems have arc flash hazards. In Canada and the United States, OSHA requires that those systems be individually analyzed and, if hazards exist, labeled to identify the arc flash boundary, the incident energy at the working distance, and the required personal protective equipment (PPE).

Our Arc Flash Analysis Training course teaches arc flash analysis in the following areas:

- Arc flash hazard analysis
- Arc flash hazard labeling plan
- Site review / compliance assessment
- Mitigation services
- Single-line diagrams

- Short circuit and coordination studies
- Preventative maintenance
- Electrical safety program review / development
- Arc Flash Training
- Personal protective equipment plan
- Documentation
- Arc flash hazard analysis

Arc Flash Hazard Analysis

Canadian Standards Association (CSA) Z462 guidelines require facility owners to perform an arc flash hazard analysis prior to allowing a worker or contractor to perform a task on energized equipment. The arc flash analysis identifies the presence and location of potential hazards and provides recommendations for personal protective equipment (PPE), boundaries for limited, restricted and prohibited approaches, recommendations for flash protection and safe work practices.

The Electricity Forum recommends that arc flash calculations be completed in conjunction with short circuit study calculations and protective device coordination to achieve the most accurate arc flash hazard results. Short circuit and coordination studies verify protective devices and arc hazard ratings, calculate momentary interrupting and relay currents, establish settings for all types of protective devices and coordinate your entire power distribution system to minimize downtime.

COURSE OBJECTIVES

Learn about arc flash hazards, standards, safety and calculations. This course is designed to educate participants about all aspects of arc flash studies.

LEARNING OBJECTIVES

Upon completion of this course, the student will learn how to:

- Develop A Realistic Risk Assessment, Ensuring Proper Personnel Safety And Increased Compliance By Workers
- Eliminate Hours Of Engineering Time And Prevent Costly Mistakes
- Assure Electrical System Reliability
- Provide Documentation And Labeling For Your Arc Flash Hazard Safety Program
- Avoid Unnecessary Costs From Over Specification Of Gear, Providing Higher Potential Worker Productivity — Savings Thousands Of Dollars On An Annual Basis!
- Understand Short Circuit Study Fundamentals
- Understand Arc Flash Study Fundamentals
- Comply With Standards For Limits Of Approach
- Produce Arc Flash Labeling
- Perform Arc Flash Approach Boundary Calculations And More!

EASYPower DEMO SOFTWARE INCLUDED

This year, we have an agreement with EasyPower to provide our students with a FREE 1-week demo license that they can use in class to demonstrate the principles taught in our course. Students are encouraged to bring to class their own laptop computers and use the software, which should be installed before class.

**DAY ONE -
POWER SYSTEM ANALYSIS/STUDY**

1. An Overview of Fault Current Analysis

- Fault Current Sources
- Short Circuit Current Parameters
- Actual Fault Types
- Balanced Fault Analysis
- Impedance Diagrams
- Fault Current Calculations

2. An Introduction to Arc Flash Calculations

- Causes Of Electrical Flash Events
- Why Perform Arc Flash Studies? Who Should Perform Them?

3. Relevant Arc Flash Standards and Their Significance

- CSA Z462
- IEEE Standard 1584
- NESC 410A3

4. Arc Flash Calculation Procedure

- Arc Flash Equations: Arcing Fault Current, Incident Energy, Arc Flash Boundary, And Default Values

5. Calculation Methodology

- Overview Of Protective Device Coordination
- Understanding Time-Current Curves

- Fault Current Vs. Energy Released
- Calculating With Uncertainty
- Protective Device Trip Time

**DAY TWO -
POWER SYSTEM ANALYSIS/STUDY**

6. Arc Flash Calculations Continued

- Accumulated Energy
- Minimum And Maximum Faults
- Use Of Tolerances
- Current-Limited Devices

7. Computer Demonstration of Arc Fault Calculations

- Data Needed
- Options Available
- Typical Calculations

8. Electric Utility Arc Flash Programs

- Comparing CSA Z462 To NESC Requirements
- Empirical, Proprietary, And Software Calculations
- 1-Phase Vs 3-Phase Analysis / Impacts
- Distribution Utility Equipment Impacts
- Padmount Transformers & Switches
- Vaults & Manholes
- Overhead Line Impact & Analysis
- Substation / Switchgear

9. Data Collection Process

- How To Improve Outcomes
- Data Collection Activities & Skillsets
- Obstacles In Data Collection
- Required Equipment/Device Information
- Understanding Short-Circuit Ratings

10. Mitigating Risk of Arc Flash Hazards

- Clearly Understanding Risk Vs Hazard
- Overview Of Electrical Equipment
- How To Reduce Arc Flash Levels
- Fuse-Protected Vs. Non-Fuse-Protected Circuit Breakers
- Arc-Resistant Switchgear
- Arc Flash Label Issues
- Safety: The Overriding Concern
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**(855) 824-6131****(905) 686-1078****ON-LINE:**www.electricityforum.com/electrical-training/arc-flash-analysis-training**MAIL:**The Electricity Forum
1885 Clements Rd., Unit 218
Pickering, ON L1W 3V4**Register 3 Delegates at Full Price
and get the 4th Registration FREE!****REGISTRATION FEES**

The registration fee to attend the 4-Day Power System Engineering Training course is \$1,499.00 + tax. The registration fee includes: all course materials, a free magazine subscription to Intelligent Power Today Industrial Power Systems magazine, our latest Electrical Technology Handbook, a \$100 coupon towards any future Electricity Forum event (restrictions apply), refreshments. Lunch included.

FEES AND DISCOUNTS

The registration fee to attend the 2-day Arc Flash Analysis Training Course is \$899.

SAVE \$100 - Register and prepay 14 days before forum date and receive an early bird registration fee of \$799.00.

SPECIAL PROMOTION: Register 3 delegates at the full price of \$899 each, and get a 4th registration FREE!

The fee includes Workshop presentation materials,

CANCELLATION AND REFUND POLICY

Registration fees are refundable only upon receipt of written notification 10 days prior to the conference date, less a 10 per cent service charge. Substitution of participants is permissible. The Electricity Forum reserves the right to cancel any conference it deems necessary and will, in such event, make a full refund of the registration fees.

WHEN & WHERE**ARC FLASH ANALYSIS/STUDY TRAINING**

- Mississauga, ON - March 11-12, 2020
Hampton Inn and Suites Toronto Airport Hotel
3279 Caroga Drive, Mississauga, ON
Tel: 905-671-4730
- Calgary, AB - March 22-23, 2020
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SAVE \$50

REGISTER AND PREPAY 14 Days prior to course date and receive an early bird discount of \$0 off the full price.