



Content  
Community  
Connection

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## Arc Flash Analysis/Study

Course details: <https://www.electricityforum.com/electrical-training/arc-flash-analysis-training>

### COURSE DATES AND TIMES

**September 23-24 , 2024**

10:00 am - 4:30 pm ET

Arc Flash Analysis/Study is conducted to determine the incident energy levels that employees will be exposed to while working with energized electrical equipment at the facility. This course includes calculating incident energy levels, arc flash boundary, arc flash labels and more. The course also covers the most recent changes and recommendations to IEEE1584.

Arc Flash Analysis and Study is the focus of this 12-hour (2 Day) live online training 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.

This course is a companion to our **Short Circuit Analysis/Study And Protective Device Coordination Course**.

<https://www.electricityforum.com/electrical-training/short-circuit-study-training>

NFPA 70e and 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.

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. Performing arc

flash hazard analysis study on an electrical distribution system is crucial to understanding the potential arc flash hazard of electrical equipment.

An arc flash analysis/study is not a one-time event, but rather it is just a snapshot of the electrical system at one specific point in time. Any changes to the electrical system can potentially affect the accuracy of the arc flash analysis. But once arc flash analysis study in place, it must be maintained if it is to remain effective. Updating the Arc Flash Analysis/Study program maintenance involves two critical elements: the study itself and electrical worker safety training.

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 upstream main transformer, changing a feed or adding large motors etc.). 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.

Arc flash analysis training educates electrical professionals about the existence, nature, causes and methods to prevent electrical hazards. Arc flash is a serious hazard with potentially devastating potential injury. Our arc flash analysis training course includes information on arc flash awareness, standards and codes, understanding of arc flash quantities, selection and use of appropriate PPE, reading and following warning signs and labels, methods to reduce risk while working on live exposed parts, arc flash hazard assessment and documentation. This is done to ensure electrical worker safety and meeting the challenges of the arc flash safety requirements can be a difficult task. From arc flash analysis and labeling to personal protective equipment and training.

### **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 comprises the following areas:**

- Arc flash analysis
- Single-line diagrams
- Short circuit and coordination studies
- Arc flash labeling
- Mitigation plan
- Personal protective equipment

## **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.

### **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

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.

## **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!

## WHO SHOULD ATTEND

This Arc Flash Analysis Training Course is intended for electrical engineers, plant supervisors, electrical maintenance professionals and electricians who are involved with industrial, commercial and institutional electric power distribution systems: Plant, facility, and corporate electrical engineers dealing with one or more company distribution systems, and consulting and utility engineers dealing with clients' systems. Consultants, architect-engineers will also find this course very beneficial.

- Plant, facility, and corporate electrical engineers dealing with one or more company distribution systems
- Utility distribution, power quality, and customer service engineers
- Consulting engineers dealing with customers' systems
- Experienced electrical contractors who manage arc flash studies or electrical arc flash programs

## STUDENTS RECEIVE

- FREE 100-Page Digital Electrical Safety Handbook (Value \$20)
- \$100 Coupon Toward Any Future Electricity Forum Event (Restrictions Apply)
- 1.2 Continuing Education Unit (CEU) Credits (12 Professional Development Hours)
- FREE Magazine Subscription (Value \$25.00)
- Course Materials In PDF Format

## **COURSE OUTLINE**

### **Arc Flash Analysis/Study**

#### **Day 1**

##### **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. Overcurrent Coordination Fundamentals:**

- Overcurrent protection general consideration
- Protection guidelines
- TCC Plots
- CTIs

### **3. Fuse Characteristics:**

- Low Voltage Fuses
- Power Fuses
- TCC Curves
- Fuse Coordination Criteria

### **4. LV Circuit Breaker Characteristics:**

- Molded Case Circuit Breakers (MCCBs)
- Low Voltage Power Circuit Breakers
- TCC Curves
- Coordination Criteria

### **5. An Introduction to Arc Flash Calculations**

- Arc Flash Analysis
- Causes Of Electrical Flash Events
- Why Perform Arc Flash Studies? Who Should Perform Them?
- CSA Z462/NFPA 70ENF
- IEEE Standard 1584
- Fault Magnitudes
- Overcurrent device responses

### **6. Major Changes to IEEE 1584.**

- Electrode configurations
- Typical working distance
- Classes of equipment and typical gap



- Transformer exception at 240V

## **Day 2**

### **7. Calculation Methodology**

- Overview Of Protective Device Coordination
- Understanding Time-Current Curves
- Fault Current Vs. Energy Released
- Calculating With Uncertainty
- Protective Device Trip Time

### **8. Data Collection Process**

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

### **9. Arc Flash Calculations Continued**

- Accumulated Energy
- Minimum and Maximum Faults
- Use Of Tolerances
- Current-Limited Devices
- System Modes of operation
- Calculating arcing current
- Determine of arc duration

- Calculate the incident energy
- Arc-flash boundary calculations

## **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

### **Exercise:**

### **Arc flash Analysis using EasyPower Software**

### **COURSE SCHEDULE:**

Start: 10 a.m. Eastern Time

Finish: 4:30 p.m. Eastern Time

Contact us Today for a FREE quotation to deliver this course at your company's location.

<https://www.electricityforum.com/onsite-training-rfq>