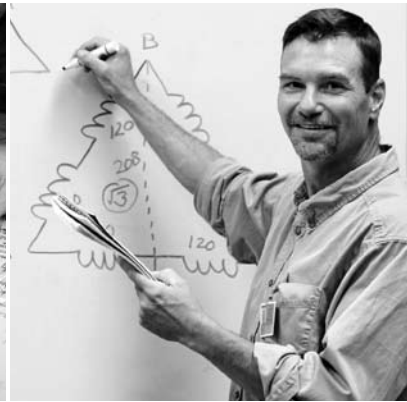




**POWR-GARD®  
SERVICES  
TRAINING  
CATALOG**



Expertise Applied | Answers Delivered



## WHO IS LITTELFUSE

### **POWR-GARD® Services Offers:**

- Electrical Safety Training
- Power & Hazard Analysis
- One-line Drawings
- Arc-Flash & Shock Analysis
- OSHA & NFPA 70E Compliance
- Short Circuit Analysis
- Coordination Studies
- Field Inspection & Data Collection
- Hazard Labeling
- Project Management

Littelfuse. Our name is synonymous with developing solutions that meet the unique needs of our customers. For more than 80 years, Littelfuse has been the company that engineers and plant managers trust to help improve the safety and reliability of their equipment. Littelfuse POWR-GARD® Services continues that tradition and is focused on helping companies increase electrical safety and becoming OSHA compliant. From performing Engineering studies to identifying Arc-Flash hazards and training facility personnel, Littelfuse POWR-GARD Services is the Electrical Safety Expert.

As the only company with a complete range of technologies, services and the expert staff to address virtually any circuit protection or electrical safety challenge – we stand alone as the number one circuit protection and safety brand in the world.

With leading market positions in North America, Europe and Asia, our worldwide team of experts is ready to put our reputation for unbiased advice, unsurpassed solutions and service to work on your unique needs.

Don't take chances when it comes to Arc-Flash and electrical safety. For more information visit [www.littelfuse.com/services](http://www.littelfuse.com/services)



## TRAINING IS MANDATED BY OSHA

Classroom Training is the most effective way to explain OSHA and NFPA® Standards



### About Our Trainers

With over 100 years of combined experience, Littelfuse POWR-GARD® Services (PGS) Electrical Safety Trainers have trained thousands of electricians, engineers, electrical maintenance supervisors, safety managers and consultants on electrical safety, NFPA® and OSHA regulations and safe electrical practices.

Littelfuse PGS trainers are:

- OSHA trained and authorized to teach 10 or 30 hour OSHA Standards for General Industry.
- NFPA, IEEE and e-Hazard trained
- NFPA 70E trained in Arc-Flash, Electrical Hazard Assessments and safety procedures.
- Qualified technical trainers or Electrical Engineers.
- Contributing authors to leading industry publications and whitepapers on Electrical Safety and Safe Design.

OSHA regulations call for safe work practices for employees working on electrical equipment and also mandate training for both Qualified and Unqualified Workers. On-site classroom training is by far the most effective way to comply with OSHA and NFPA standards and to ensure the safety of workers who install and service electrical systems.

As an expert in electrical safety and a trusted consultant to many of the world's leading companies, Littelfuse has been helping employers comply with safety standards and protect their workers for many years. Our instructors are OSHA and NFPA 70E certified and know what OSHA expects of employers, assuring that the material is practical and up-to-date.

We draw upon real world experiences to show employees how to identify and assess electrical hazards, minimize accidents by using the correct tools and protective equipment and improve safe work procedures.

Upon completion of a Littelfuse training course, workers receive a Certificate of Accomplishment that documents compliance with OSHA and NFPA mandated training. Littelfuse PG Training Services is recognized in several states as an authorized CEU provider of safety training for licensed electricians who are required by state law to take Continuing Education courses in electrical safety to maintain their electrical licenses. If the trainee is not licensed, the Certificates provide their employers with the knowledge that they have successfully completed the training course.



## OVERVIEW

### Don't Become a Safety Statistic

Did you know that OSHA is using NFPA 70E as evidence of a recognized hazard, and uses this standard as a guide when investigating accidents and citing violations? NFPA 70E has become an accepted method of hazard abatement, and as such, Qualified and Unqualified Workers must receive electrical safety training.

If you are responsible for keeping workers safe and for documenting safety training of your employees, consider these chilling statistics:

- In the 2007 OSHA fiscal year (October 2006 - September 2007) OSHA cited 113,557 violations across all industry segments under federal OSHA jurisdiction, with penalties over \$91 Million.
- The National Safety Council states that over 1000 people die each year from electrical accidents.
- Work-related injuries can cost businesses over \$30 million per incident in fines\*, medical costs, litigation, lost business and equipment costs.
- Up to 10 Arc-Flash incidents occur each day in the U.S., and over 2000 workers are sent to burn centers each year with severe Arc-Flash burns.
- OSHA states that 80% of electrically related accidents and fatalities among Qualified Workers are caused by Arc-Flash or Arc-Blast.

\* Source: National Safety Council.

Deciphering OSHA regulations to set up a training program can be a daunting task. For example, OSHA requires documented training of personnel to perform the following tasks:

- Deenergize equipment
- Eliminate hazards
- Identify and assess equipment rated over 50 volts
- Understand safe working distances and boundaries
- Use proper lock-out and tag-out procedures
- Select, use and maintain Personal Protective Equipment (PPE)
- Use test instruments and equipment

POWR-GARD® Services (PGS), in conjunction with Littelfuse University, has developed a comprehensive curriculum of training courses. These courses get to the heart of industry consensus standards including OSHA, NFPA and CSA requirements and proven best practices.

High-quality classroom training is the best investment to ensure a safer workplace and minimize costly accidents. Workers who complete PGS Training courses will receive the proper training to help their company:

- Eliminate or reduce worker injuries
- Comply with OSHA, NFPA® and CSA standards and regulations
- Improve worker safety and morale
- Increase productivity and reduce downtime
- Minimize safety incidents and their associated costs
  - Medical
  - Insurance
  - OSHA citations
  - Litigation
  - Equipment replacement

Most of our courses are held right at your facility or a nearby location—minimizing employee travel and time away from work. Some courses are also available online. Whether training is on-site or online, we come to you. POWR-GARD Services Training can include the following:

- Classroom Exercises
- Safety Manuals and Workbooks
- Technical Papers
- Video Presentations
- PowerPoint Presentations
- Personalized Certificates of Accomplishment

Littelfuse University offers a variety of training programs in online, on-site and webcast formats. In addition to PGS Training Courses, Littelfuse University training topics include Basic Fuseology, product applications and value-added programs. For our complete training capabilities, or to request customized training, call 1-800-832-3873 or visit [www.littelfuse.com/services](http://www.littelfuse.com/services).

# PGS COURSE OVERVIEW

Safety codes require employers to provide training for their workers on how to recognize electrical safety hazards.



POWR-GARD® Services in conjunction with Littelfuse University, offers a broad selection of on-site and online courses to help you meet OSHA, NFPA® and CSA standards. PGS training course offerings are described in detail on the following pages.

Course Part No.	Course Description	Course Length	Electricians	Engineers & Electrical Contractors	Maintenance Personnel	Supervisors & Safety Managers	Qualified Workers	Unqualified Workers
PGS101	Introduction to Electrical Safety	1–2 hours	■	■	■	■	■	
PGS201	Introduction to OSHA & NFPA 70E Requirements for Electrical Hazard Assessments (Seminar)	4 hours		■		■		
PGS301	'How To' Workshop for Performing Code Compliant Electrical Hazard Assessments (Seminar)	6–8 hours		■		■		
PGS401	Electrical Hazard Awareness Training	1 hour	■				■	■
PGS402	Pre-Assessment NFPA 70E Training for Qualified Electrical Workers	4 hours	■	■	■	■	■	
PGS403	Post-Assessment NFPA 70E Training for Qualified Electrical Workers	4 hours	■	■	■	■	■	
PGS404	OSHA and NFPA 70E Electrical Safety Training	6–8 hours	■	■	■	■	■	■
PGS405	Overview and Changes to NFPA 70E 2009 Safety Requirements	2–4 hours	■	■	■	■	■	
PGS406	Overview of CSA-Z462	2–4 hours	■	■	■	■	■	■
PGS501	Proper Fuse Selection & Application	1 hour	■	■	■	■	■	
PGS502	Understanding & Increasing Your Panel's SCCR	1.5 hours	■	■		■		
PGS503	Selective Coordination Basics	1 hour	■	■	■			
PGS504	Power System Grounding	2–4 hours	■	■	■	■	■	

# PGS COURSE OFFERING



Call 800-TEC-FUSE to customize content, combine courses or request a class in a webcast format.

## **COURSE PGS101**

### **Introduction to Electrical Safety**

**DURATION:**

1-2 Hours

**LEVEL:**

Introductory

**ATTENDANCE:**

Electricians  
Engineers & Electrical Contractors  
Maintenance Personnel  
Supervisors & Safety Managers  
Qualified Workers

**DESCRIPTION:**

This course is intended for workers and their managers. It provides a brief introduction to Electrical Safety and OSHA and NFPA® safety standards and regulations. Arc-Flash and Shock hazards are introduced along with OSHA and NFPA expectations of employers and employees.

**DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- Other resources for further study
- CEU credit if applicable, after passing an Electrical Safety Quiz

## **COURSE PGS201**

### **Introduction to OSHA and NFPA 70E Requirements For Electrical Hazard Assessments**

**DURATION:**

4 Hours

**LEVEL:**

Intermediate

**ATTENDANCE:**

Engineers & Electrical Contractors  
Supervisors & Safety Managers

**DESCRIPTION:**

This course is an introduction to OSHA and NFPA 70E Electrical Safety Standards and Regulations for Qualified workers and supervisors that may work on energized equipment. It introduces how to assess the workplace for Arc-Flash and other Electrical Hazards, and discusses how to select Personal Protective Equipment (PPE) for electrical workers. The course analyzes the methods used to identify and reduce electrical hazards, and discusses how to begin an Electrical Hazard Assessment.

**DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- CEU credit if applicable, after passing an Electrical Safety Quiz



**COURSE PGS301**  
"How-to" Workshop For  
Performing Code Compliant  
Electrical Hazard Assessments

**DURATION:**  
6–8 Hours

**LEVEL:**  
Advanced

**ATTENDANCE:**  
Engineers & Electrical Contractors  
Supervisors & Safety Managers

**DESCRIPTION:**

This workshop provides "hands-on" examples for engineers, supervisors, and Qualified workers that want to learn how to perform an Arc-Flash and Electrical Hazard Assessment of their plant or facility. OSHA, NFPA 70E, CSA-Z462, NEC, CEC, and IEEE methods of identifying, assessing and minimizing electrical hazards are discussed and analyzed. Participants will learn how to assess the workplace for hazards to protect Qualified and Unqualified workers. For this class, we recommend that attendees bring a copy of NFPA 70E, which can be purchased at [www.nfpa.org](http://www.nfpa.org)

**TOPICS INCLUDE:**

- How to establish Hazard Risk Categories and Protection Boundaries
- How to select and use Personal Protective Equipment (PPE)
- How to use Energized Electrical Work Permits
- How to prepare NEC® Arc-Flash warning labels

**DELIVERABLES:**

- PowerPoint presentation
- Workbook and classroom exercises
- Handout materials to help begin an Electrical Hazard Assessment
- Safety Handbook
- CEU credit if applicable, after passing an Electrical Safety Quiz

**COURSE PGS401**  
Electrical Hazard  
Awareness Training

**DURATION:**  
1 Hour

**LEVEL:**  
Introductory

**ATTENDANCE:**  
Electricians  
Qualified Workers  
Unqualified Workers

**DESCRIPTION:**

This course is designed specifically for workers who may work near energized equipment, or who may use portable electric power tools or equipment. OSHA 1910 Subpart S standards are addressed, and workers are trained to recognize Electrical Shock and Arc-Flash hazards and understand why an Electrical Hazard Assessment is necessary or has been completed. Workers learn the duties and expectations of Qualified and Unqualified workers.

**TOPICS INCLUDE:**

- Basic OSHA Electrical Safety
- Lockout/Tagout requirements
- Understanding Protection Boundaries

**DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- CEU credit if applicable, after passing an Electrical Safety Quiz



## PGS COURSE OFFERING

### **COURSE PGS402** Pre-Assessment NFPA 70E Training For Qualified Electrical Workers

**DURATION:**  
4 Hours

**LEVEL:**  
Intermediate

**ATTENDANCE:**  
Electricians  
Engineers & Electrical Contractors  
Maintenance Personnel  
Supervisors & Safety Managers  
Qualified Workers

#### **DESCRIPTION:**

This course is for Qualified workers who may work on energized equipment before a detailed Arc-Flash or Electrical Hazard Assessment is performed. Workers are trained to recognize Electrical Shock and Arc-Flash hazards, and utilize safe work practices, using NFPA 70E Tables to select Personal Protective Equipment (PPE). For this class, we recommend that attendees bring a copy of NFPA 70E, which can be purchased at [www.nfpa.org](http://www.nfpa.org)

#### **TOPICS INCLUDE:**

- How to establish an Electrically Safe Work Condition
- How to use NFPA 70E tables to establish Hazard Risk Categories
- How to verify and maintain NFPA 70E Table requirements

#### **DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- CEU credit if applicable, after passing an Electrical Safety Quiz

### **COURSE PGS403** Post-Assessment NFPA 70E Training For Qualified Electrical Workers

**DURATION:**  
4 Hours

**LEVEL:**  
Advanced

**ATTENDANCE:**  
Electricians  
Engineers & Electrical Contractors  
Maintenance Personnel  
Supervisors & Safety Managers  
Qualified Workers

#### **DESCRIPTION:**

This course is for Qualified workers that work on energized equipment after an Arc-Flash or Electrical Hazard Assessment has been performed. Workers are trained to recognize Electrical Shock and Arc-Flash hazards, and understand Hazard Risk Categories and Protection Boundaries. Workers learn why the Electrical Hazard Assessment was performed, how to reduce hazards and how to select and properly use PPE. For this class, we recommend that attendees bring a copy of NFPA 70E, which can be purchased at [www.nfpa.org](http://www.nfpa.org)

#### **TOPICS INCLUDE:**

- Use of Energized Work Permits
- How to read and interpret NFPA® Arc-Flash and Shock Warning labels
- Protection Boundaries
- How to select, use, and care for Personal Protective Equipment

#### **DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- CEU credit if applicable, after passing an Electrical Safety Quiz

Call 800-TEC-FUSE to customize content, combine courses or request a class in a webcast format.

**COURSE PGS404**  
**OSHA and NFPA 70E Electrical Safety Training**

**DURATION:**  
6–8 Hours

**LEVEL:**  
Intermediate and Advanced

**ATTENDANCE:**  
Electricians  
Engineers & Electrical Contractors  
Maintenance Personnel  
Supervisors & Safety Managers  
Qualified Workers  
Unqualified Workers

**COURSE PGS405**  
**Overview and Changes to NFPA 70E 2009 Safety Requirements**

**DURATION:**  
2–4 Hours

**LEVEL:**  
Intermediate

**ATTENDANCE:**  
Electricians  
Engineers & Electrical Contractors  
Maintenance Personnel  
Supervisors & Safety Managers  
Qualified Workers

**DESCRIPTION:**

This course is suitable for those who have already completed an Arc-Flash Hazard Assessment, or who want to learn how to comply with OSHA and NFPA 70E regulations and standards. Portions of the course are also suitable for Unqualified Workers who may work near energized equipment and other electrical hazards. For this class, we recommend that attendees bring a copy of NFPA 70E, which can be purchased at [www.nfpa.org](http://www.nfpa.org)

**TOPICS INCLUDE:**

- OSHA Regulations and Training Requirements
- Introduction to NFPA 70E and IEEE 1584
- Overview of an Electrical Hazard Assessment
- How to reduce Shock and Arc-Flash Hazards
- How to select and use Electrical PPE

**DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- Classroom exercises
- CEU credit if applicable, after passing an Electrical Safety Quiz

**DESCRIPTION:**

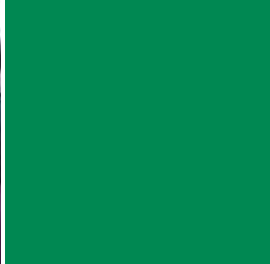
This course focuses on previous and new requirements of NFPA 70E, *Standard for Electrical Safety in the Workplace*. An overview of the Standard and its requirements will be presented with special attention to changes in the new 2009 Edition of NFPA 70E.

**TOPICS INCLUDE:**

- Who is covered by NFPA 70E
- Employee Training Requirements
- Arc-Flash Hazard Calculations
- NFPA 70E Table Method
- Equipment Warning Label Requirements

**DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- CEU credit if applicable, after passing an Electrical Safety Quiz.



## PGS COURSE OFFERING

### **COURSE PGS406** Overview of CSA-Z462

**DURATION:**  
2–4 Hours

**LEVEL:**  
Intermediate

**ATTENDANCE:**  
Electricians  
Engineers & Electrical Contractors  
Maintenance Personnel  
Supervisors & Safety Managers  
Qualified Workers

**DESCRIPTION:**

This course focuses on the requirements of the Canadian Standard CSA-Z462, *Standard on Workplace Electrical Safety*. An overview of the standard and its requirements will be presented along with how this standard was developed to be in parallel with NFPA 70E.

**TOPICS INCLUDE:**

- Who is covered by CSA-Z462
- Basic Requirements
- Arc-Flash Hazard Calculations
- Z462 Table Methods
- Equipment Warning Label Requirements

**DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- CEU credit if applicable, after passing an Electrical Safety Quiz

### **COURSE PGS501** Proper Fuse Selection and Application

**DURATION:**  
1 Hour

**LEVEL:**  
Intermediate

**ATTENDANCE:**  
Electricians  
Engineers & Electrical Contractors  
Maintenance Personnel  
Supervisors & Safety Managers  
Qualified Workers

**DESCRIPTION:**

Learn basic fuseology principles, including selecting and applying current-limiting fuses to increase the safety and reliability of overcurrent circuit protection.

**TOPICS INCLUDE:**

- Fuse and fuseholder selection considerations
- UL fuse classes and typical applications
- Fuse characteristic curves and Selective Coordination
- Recommended fuse sizing for motors and transformers

**DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- CEU credit if applicable, after passing a Safety Quiz

### **COURSE PGS502** Understanding and Increasing Your Panel's SCCR

**DURATION:**  
1.5 Hours

**LEVEL:**  
Intermediate

**ATTENDANCE:**  
Electricians  
Engineers & Electrical Contractors  
Supervisors & Safety Managers

**DESCRIPTION:**

Learn how to determine the Short Circuit Current Rating (SCCR) of industrial control panels, and increase the SCCR of the entire panel.

**TOPICS INCLUDE:**

- UL 508A methods and NEC® Article 409 requirements
- Approved methods for determining SCCR of components and entire panels
- How current-limiting fuses can increase a panel's SCCR

**DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- CEU credit if applicable, after passing an Electrical Safety Quiz

OSHA and NFPA® Standards require employers to assess the workplace for electrical hazards.



### **COURSE PGS503** Selective Coordination Basics

**DURATION:**  
1 Hour

**LEVEL:**  
Intermediate

**ATTENDANCE:**  
Electricians  
Engineers & Electrical Contractors  
Maintenance Personnel  
Design Engineers

**DESCRIPTION:**

Learn where selective coordination is required and the basic principles and benefits of selective coordination, including the methods on how to achieve selective coordination, increase system reliability, and improve safety.

**TOPICS INCLUDE:**

- Interpreting Time Current Curves
- NEC® Codes and Standards Requirements
- Benefits of Current Limitation
- Overcurrent Protective Device Options

**DELIVERABLES:**

- PowerPoint presentation
- Handout materials
- CEU credit if applicable, after passing an Electrical Safety Quiz

### **COURSE PGS504** Power System Grounding

**DURATION:**  
2–4 Hours

**LEVEL:**  
Intermediate

**ATTENDANCE:**  
Electricians  
Engineers & Electrical Contractors  
Maintenance Personnel  
Supervisors & Safety Managers  
Qualified Workers

**DESCRIPTION:**

Learn basic principles and benefits of power system grounding commonly found in industrial, commercial, and institutional environments. Discuss industry practices to increase system reliability and improve worker safety. Describe how to save man-hours by having automated ground-fault protection systems, such as location and continuous NGR monitoring.

**TOPICS INCLUDE:**

- Advantages and Disadvantages of Ungrounded, Solidly Grounded and Resistance-Grounded Systems
- Ground Fault Protection Methods for each Grounding System
- How to properly design a Resistance Grounded System
  - Define Charging Current and Sympathetic Tripping
  - System-Grounding Monitoring

**DELIVERABLES:**

- PowerPoint presentation
- Handout materials including a Resistance Grounding Selection Guideline
- CEU credit if applicable, after passing an Electrical Safety Quiz



Contact us today for more information.

[www.littelfuse.com/services](http://www.littelfuse.com/services)  
**1-800-832-3873**