

# Electrical Safety for Mining

3.5 Days, 2.5 CEUs

The harsh environment of mines – moisture, flammable substances, and dust – creates electrical hazard risks unheard of in any other industry. MSHA compliance officers are very active in every mine within the United States. Compliance with MSHA and OSHA electrical safety regulations minimizes the risk of electrical accidents, and reduces losses associated with shutdowns and outages. Staying up-to-date with electrical safety standards often places a burden on understaffed mine operations.

This course provides up-to-date information that will aid in establishing an effective electrical safety program in mines. This course is intended for new, multi-craft or experienced electricians, technicians, engineers, supervisors and safety managers that install, maintain, repair, troubleshoot or work around low and medium voltage electrical systems in mines.

## Lab and Classroom Attire:

AVO is committed to the personal safety of each participant and requires long pants and ANSI rated “safety toe” work shoes for class and lab activities. Lecture courses may involve a tour of a work or shop area and for this reason open toe shoes and shorts are not considered appropriate attire for the classroom.

## Learning Objectives:

To receive 2.5 CEUs, participants must attend 3.5 days of class (25 contact hours) and attain a minimum grade of 80% on the final exam. Upon completion of this course the participant will demonstrate that he/she is able to:

- Explain the hazards and effects of electricity.
- Select appropriate personal protective equipment for a variety of applications.
- Utilize safe work practices, both above and below ground.
- Outline installation and testing of permanent and temporary grounding systems for personal protection.
- Identify specific hazards for working with electrical equipment in mines.
- Apply lockout/tagout procedures, energized work permits, and overhead line clearances.
- Interpret MSHA and applicable OSHA regulations.

## SCOPE

### Day 1\*

- I. Introduction (0.5 hrs)
  - A. Schedule
  - B. Course Outline
- II. Hazards of Electricity (3.5 hrs)
  - A. Electrical Shock
  - B. Electrical Arc Flash
- AM Break
  - C. Electrical Arc Blast
- III. Electrical Safety Regulations and Standards for Mining (3 hrs)
  - A. MSHA
- Lunch
  - B. OSHA

### PM Break

- C. Industry Consensus Standards

### Day 2

- IV. Deenergized Work (LOTO) (4 hrs)
  - A. Deenergization
  - B. Confirming System is Deenergized
  - C. One-Line Diagrams
  - D. Lockout/Tagout
  - E. Application of Control
- AM Break
  - F. Reenergization
  - G. Additional Requirements

- H. Additional Regulatory Requirements for Electrical Lockout

- I. Typical Minimal Lockout or Tagout System Procedures

### Lunch

- V. Personal Protective Grounding (3 hrs)
  - A. Regulatory Requirements for Grounding
  - B. Purpose of Protective Grounds
  - C. Sizing of Protective Grounds
  - D. Effects of Current and PPE Grounding
  - E. Grounding Equipment

### PM Break

\*Class scheduling times may vary based on discussions and size of class

# Electrical Safety for Mining

3.5 Days, 2.5 CEUs

## SCOPE (continued)

F. Personal Protective Ground Jumper Testing	C. Electrical Hazard Risk Assessment	Day 4 (1/2 Day) (4 hrs)
G. Grounding Equipment Manufacturers/Suppliers	D. Training Requirements for a Qualified Person	C. Arc Flash Protective Equipment
H. Application of Protective Grounds	Lunch	D. Arc Blast Protective Equipment
I. Induced Voltages and Currents on Deenergized Circuits and Equipment	E. Regulatory Requirements for Energized Work	E. Other Protective Equipment
Day 3	F. Overhead Line Clearances	F. Energy Detection Equipment
VI. Energized Work (6 hrs)	G. Protective Equipment and Tools	AM Break
A. Definition of Energized Work	PM Break	VIII. Conclusion (1 hr)
B. Definition of Qualified Person	VII. Personal Protective Equipment (1 hr)	A. Review
AM Break	A. Protective Techniques	B. Final Exam
	B. Electrical Protective Equipment	