

OSHA Electrical Safety Standards

(4 day)

Nearly every safety professional or anyone responsible for safety is intimidated by the topic of electricity, electrical equipment and dealing with electrical workers (electricians). Imagine an electrical course that illustrates, demonstrates, and explains these electrical concepts and requirements (with virtually no mathematics) so simply and vividly that attendees actually understand it and have their apprehensions about electricity dispelled.

Even “qualified” electrical workers attending have learned much including various electrical myths/misnomers which are dispelled during the course including the false concepts such as “electricity flows to ground” and “electricity takes the path of least resistance”.

This is the definitive electrical safety course for safety professionals (and others) which prepares “unqualified” persons to be able to communicate with and understand the mystique and jargon of the “qualified” (electricians). This curriculum was developed by Grizzy for the OSHA investigators to prepare them to be able to effectively understand and communicate with qualified electrical workers as well as investigate electrical accidents and fatalities.

Learn such critical items as what the mysterious three phase is all about and how it works, the jargon associated with various electrical hardware including distinctions between the numerous raceways/conduits, cable assemblies, and much more, how these are properly used as prescribed by the codes and standards and numerous other important topical areas. This course is designed to provide the student with a survey of OSHA's key electrical standards as well as equivalent NFPA electrical standards and the hazards associated with electrical installations and equipment. Topics include: electrical fundamentals, overcurrent protection, ampacity, instrumentation, branch circuits, feeder circuits, equipment grounding, Ground Fault Circuit Interrupters, Three Phase Circuits, OSHA Standards requirements, equivalent NEC® requirements and introduction to NFPA 70E. In addition to the electrical installation specification standards this course also includes OSHA's electrical safety related work practice standards which are based on NFPA 70E. Nearly all concepts presented are vividly and visually demonstrated, illustrated and explained from an easy to understand

conceptual level with virtually no mathematics required. Emphasis is placed on electrical hazard recognition and OSHA policies and procedures are also discussed. Students are encouraged to bring their electrical test equipment and will be instructed on the safe and correct use of the testers as well as the limitations of the various electrical testers. Testers are provided for the hands on lab exercise for any attendees who do not have any electrical safety test equipment. Students will use electrical testers on “specially designed fault board outlets” provided in order to, determine branch circuit conditions, identify the associated hazards and reference the applicable standards for each separate condition as well as to illustrate uses and limitations of the circuit testers. These hands on fault boards are available nowhere else other than this course. Several application models/paradigms which have been developed by the instructor will be presented which will be useful in assisting attendees in locating the correct electrical standards reference as well as to identify causal factors in an electrically related accident / fatality investigation. OSHA policy and compliance are heavily discussed throughout the course with a focus on what will OSHA look for and how it can be cited. This is the only course of its type anywhere, which prepares safety professionals (and others) in understanding and communicating with “qualified” electrical workers, and is considered the definitive electrical course for safety professionals.

Instructional Methodology: Each student receives an interactive course workbook containing all of the course topics and reference materials which they use throughout the course, as well as a copy of a cross reference guide “CSHO Code Finder”. The “CSHO Code Finder” is unique cross reference guide (developed and exclusively published by Grizzly) used to locate equivalent code references between OSHA’s various electrical standards and the NFPA electrical standards. This reference guide cross references these standards line by line between OSHA’s General Industry Subpart S electrical standards (including .331-.335 electrical safety related work practices to NFPA 70E), OSHA’s Construction Subpart K standards, and the current edition of NFPA 70 (NEC® National Electrical Code).

The prodigious use of instructional media is employed. The instructional media includes video clips and stills of actual OSHA accident and fatality cases (electrocutions as well as arc flash/arc blast), many of which were investigated by the instructor in his official OSHA capacity with detailed explanations of causal factors revealed by the OSHA investigation and resulting citations

explained in class. Additionally, realia (actual equipment including tools, hardware, etc.) will be available for student examination which is especially important for students with kinesthetic learning tendencies. The extensive use of oral questioning techniques as well as reinforcement techniques are employed for a sound and effective didactic approach. Highlights of the course are application of instrumentation on fault boards to identify electrical wiring including the associated hazards and standards which apply. Most of all, Grizzys approach to training is that students should have fun learning...what a concept!

Key Topics Include

Electrical Standard Categories – The key questions needed to locate the correct electrical standard for the condition.

Fundamental Hazards of Electricity – What all the electrical standards address.

Electrical Fundamentals – What is electricity? The behavior of electricity and technical terminology all without any mathematics (just the concepts).

Ampacity, overcurrent & Ω Law – Short circuits, open circuit, circuit breakers, fuses, fire protection.

Instrumentation – Electrical testers are not infallible. What do they actually indicate and how can they be fooled.

Hardware & Wiring Methods – “Electrical speak”, what’s all the electrical hardware called (including the electrician jargon) from the NEC® and how to determine where it can be used.

General Standard Requirements – OSHA and NEC® including guarding requirements.

Flexible Cords & Cordsets – These are not exclusively temporary wiring and can be a fixed wiring method.

Electrocution Investigation Model – Investigative approach, accident and fatality workshop.

AC, 3 ϕ , Transformers – What is this three phase stuff, electrical services, delta, wye, separately derived systems, transformers and more.

Branch Circuits & Polarity – Feeders, branch circuits, receptacle outlet wiring, 3 light electrical outlet testers, and hazards associated with “reverse polarity”.

Electrical Grounding – Grounding is used in many contexts in the codes this segment explains the distinctions, the import of each, how to measure ground impedance, and more.

Ground Fault Circuit Interrupters – How they work, where required by codes, how they fail, and how they can still cause a fatality when working properly.

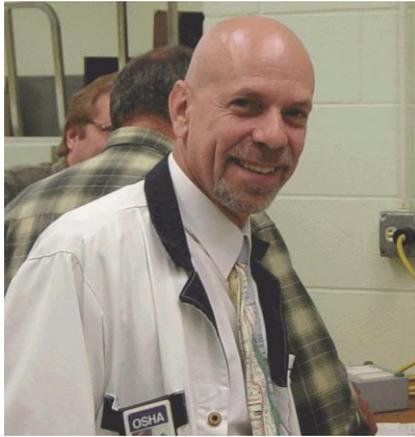
OSHA’s ESRWP Standards – How to determine who is a “qualified” versus an “unqualified” in the standards, what each needs to know, the training required by the OSHA standard, and more.

Electrical Test Equipment Lab – Students use electrical testers to test over a dozen different outlets to determine how they are incorrectly wired, the hazards associated with each condition and the appropriate standards for each condition. These are all actual conditions found in the field.

Course: Electrical Safety Standards

Instructor: John "Grizzly" Grzywacz

	Day 1	Day 2	Day 3	Day 4
1	Electrical Standard Categories Finding the correct electrical Standard Types of electrical standards – the big picture	Ampacity, overcurrent & Ω Law	Flexible Cords & cordsets Uses permitted – Uses not permitted Flexible cords properly used is a good thing	Cont'd
2	Introduction & Hazards of Electricity What all the electrical standards and codes address	Cont'd Overcurrent device continuous current rating, interrupting capacity rating Short circuits & open circuits	Electrocution Investigation Model Fatality analysis workshops step & touch potentials How far can electricity jump?	GFCI's Ground Fault Circuit Interrupters
3	Cont'd	Instrumentation Limitations of test equipment and how they can be fooled	AC, 3\emptyset, Transformers "what is this 3 phase stuff" 1 \emptyset , 3 \emptyset , Delta, Wye Separately derived systems	OSHA's ESRWP standards Electrical Safety Related Work Practices
4	Electrical Fundamentals Current, voltage, resistance, impedance, reactance	Hardware & Wiring methods from the NEC Chapter 3 "Electrical speak" Cable assemblies, conductors, raceway, conduits	Cont'd & Branch Circuits Polarity 1910.304 Feeders, Branch circuit conductors, three light circuit testers, outlet wiring, reverse polarity hazards	Cont'd
5	Cont'd Voltage drop, Hazardous effects of resistance	General Standard Requirements Guarding live parts	Cont'd	Electrical Test Equipment Lab Student Test of Fault Boards
6	Cont'd	Cont'd	Equipment Grounding Cont'd conductor path, Impedance, measuring ground impedance	Review Lab & Course closing



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“**Grizzy**”, as he likes to be called has been recognized by OSHA’s National Office in Washington D.C. as both a National Electrical Code (NEC®) historian as well as “the best electrical safety trainer in the country!” Certainly at the very least Grizzy has been OSHA’s electrical safety “go-to guy” and has been instrumental in shaping and interpreting OSHA policy and regulations for several decades.

Grizzy has trained OSHA compliance officers, appeared as OSHA’s electrical expert, and guided literally hundreds and hundreds of electrical fatality investigations. **Grizzy continues to train OSHA compliance officers** and personnel coast to coast, as well as still providing investigative assistance to the Agency on fatality investigations and significant cases. His electrical expertise has not only shaped OSHA policy but also the OSHA Electrical Standard’s. Grizzy is currently a **member of the ASTM F-18 Committee** which writes the “**Electrical Protective Equipment for Workers**” standards.

In addition to electrical safety courses, Grizzy has chaired and taught OSHA’s Machinery and Machine Safeguarding, OSHA Legal Aspects, Lock Out Tag Out, and Investigative Techniques, just to name a few.

Licensed by the Department of Education, and prior to his OSHA career, Grizzy had been both an **educator and administrator** for various public and private schools and held the position of Electronic Department Chairman and Director of Education at a New York City proprietary school.

In addition to being a **professional speaker** and **nationally recognized seminar leader** with **over 40,000 hours of platform experience**, Grizzy has lectured at numerous colleges and universities all across the US and has numerous published works in video and print which have assisted safety professionals and helped workers for decades.

Recognized nationally as preeminent in regulatory electrical safety training, private corporations and agencies outside of OSHA are now **obtaining the same training that the OSHA inspectors obtain from Grizzy**, as well as insight into navigating the complex regulatory requirements.