

OSHA Electrical Safety Standards

(5 day course)

The quintessential OSHA electrical course conducted by OSHA Professor “Grizzy” for OSHA nationwide is now available to you.

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.

Various electrical myths/misnomers are dispelled during the course including the false concepts such as “electricity flows to ground” and “electricity takes the path of least resistance”. Factual understanding and application of these concepts is requisite to be able to conduct an electrical accident investigation.

This is the definitive electrical safety course preparing occupational safety and health professionals to be able to communicate and understand the mystique and jargon of the “qualified” electrical workers (wiremen/electricians), and conduct investigations. This curriculum was originally developed by Grizzy in the 1990’s upon his assuming a faculty position at the OSHA National Training Institute. Naturally it is continuously refined and updated to reflect the latest cutting edge OSHA issues and continues to be taught by Grizzy to the OSHA investigators and consultation staff nationwide preparing OSHA staff to investigate electrical accidents and fatalities.

Learn such critical concepts such 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.

Students are required to bring certain electrical instruments/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. Electrical instruments will be applied and demonstrated as they have been used by Grizzly conducting electrical accident and fatality forensic investigations for OSHA. Students will use their electrical testers on "specially designed fault board outlets" in class in order to, determine branch circuit conditions, identify the associated hazards and reference the applicable standards for each of the conditions 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's legal requirements and compliance are heavily discussed throughout the course with a focus on what will OSHA look for

and how conditions can be cited. Actual OSHA accident and fatality cases will be discussed and analyzed. This is the only course of its type anywhere, which prepares safety professionals 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 are used throughout the course, as well as a copy of a cross reference book “CSHO Code Finder”. The “CSHO Code Finder” is a unique comprehensive reference book (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 photos 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 the investigations including causal factors revealed by the OSHA investigation as well as resulting citations all explained in class. Additionally, extensive 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 by every student/attendee on fault boards in order to identify electrical wiring conditions 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. It's important to know the limitations of electrical instruments.

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/quantify ground impedance, and more including ground impedance of fixed/hard wired equipment.

Ground Fault Circuit Interrupters – How they work, where required by codes, how they fail, and how they can still cause a fatality even 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 their 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	Day 5
1	<p>Electrical Standard Categories</p> <p>Finding the correct electrical Standard</p> <p>Types of electrical standards – the big picture</p>	<p>Ampacity, overcurrent & Ω Law</p>	<p>General Standard Requirements Cont'd</p>	<p>Equipment Grounding</p> <p>conductor path, Impedance, measuring ground impedance</p>	<p>OSHA's ESRWP standards & LOTO</p> <p>NFPA 70E</p>
2	<p>Introduction & Hazards of Electricity</p> <p>What all the electrical standards and codes address</p>	<p>Cont'd</p> <p>Overcurrent device continuous current rating, interrupting capacity rating Short circuits & open circuits</p>	<p>Flexible Cords & cordsets</p> <p>Uses permitted – Uses not permitted</p> <p>Flexible cords properly used is a good thing</p>	<p>Cont'd</p>	<p>OSHA's ESRWP standards Cont'd</p>
3	<p>Cont'd</p>	<p>Instrumentation</p> <p>Limitations of test equipment and how they can be fooled</p>	<p>Electrocution Investigation Model</p> <p>Fatality analysis workshops step & touch potentials</p> <p>How far can electricity jump?</p>	<p>Cont'd</p>	<p>OSHA's ESRWP standards Cont'd</p>
4	<p>Electrical Fundamentals</p> <p>Current, voltage, resistance, impedance, reactance</p>	<p>Hardware & Wiring methods from the NEC Chapter 3</p> <p>"Electrical speak"</p> <p>Cable assemblies, conductors, raceway, conduits</p>	<p>Cont'd & AC, 3\emptyset, Transformers</p> <p>"what is this 3 phase stuff"</p> <p>1\emptyset, 3\emptyset, Delta, Wye</p> <p>Separately derived systems</p>	<p>GFCI's</p> <p>Ground Fault Circuit Interrupters</p>	<p>Electrical Test Equipment Lab</p> <p>Student Test of Fault Boards</p>
5	<p>Cont'd</p> <p>Voltage drop, Hazardous effects of resistance</p>	<p>Cont'd</p>	<p>Branch Circuits</p> <p>Polarity 1910.304</p> <p>Feeders, Branch circuit conductors, three light circuit testers, outlet wiring, reverse polarity and associated hazards</p>	<p>Cont'd</p>	<p>Cont'd & Review Lab</p>
6	<p>Cont'd</p>	<p>General Standard Requirements</p> <p>Guarding live parts</p>	<p>Cont'd</p>	<p>OSHA's ESRWP standards</p> <p>Electrical Safety Related Work Practices</p>	<p>Course closing</p>



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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 decades.

Having spent most of his OSHA career on faculty at the OSHA National Training Institute, Grizzy has trained OSHA compliance officers, appeared as OSHA's electrical expert, and guided 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.

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 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

Grizzy developed the OSHA curriculum and courses while on faculty at the OSHA National Training Institute beginning in the 1990's including the Electrical Standards courses, Power generation Transmission and Distribution course as well as Machinery and Machine Safeguarding courses. Grizzy has received numerous awards from the U.S. Secretary of Labor including for his work in assisting the OSHA Strategic Partnership with Electrical Transmission and Distribution Construction Contractors and Trade Associations Team.

Recognized nationally as preeminent in electrical regulatory 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. Grizzys training philosophy is that students/attendees should have fun while learning. Quite a concept!

Grizzys passion for electricity and decades of collecting rare electrical artifacts which he is now exhibiting and demonstrating affords attendees of his events a unique opportunity to actually see a "slice of history". In fact his events have been characterized by attendees: "It's like watching the History Channel, only live!"

Grizzy is frequently commissioned to present many of his unique and spectacular high voltage keynote shows at major professional conferences and other conventions including Sci-Fi cons, and Steampunk festivals throughout the U.S. Video clips of this spectacular show can be viewed on Grizzys website.