

HIGH VOLTAGE ELECTRICAL MAINTENANCE

Join our global industry expert & instructor:
John Robin, to upgrade your learning experience.



Online Virtual Classroom Training



16 Hours Live Interactive Sessions

11 - 14 March 2024

09:00 - 13:00 ATLANTIC STANDARD TIME (AST)

www.biiworld.com

Course Overview:



Today, electricians moving into the High Voltage work world need more preparation than ever. Once you cross the 750 Volt threshold, new techniques are required to guarantee your personal safety, and the workers entering this environment.

Electricians must recognize all the different parts of high voltage equipment, know the functions of the components, and how to interpret the data on the gauges and relays. Electricians must also be cognisant of safe work regulations covered in CSA Z462 and NFPA 70E.

This 4 Day online High Voltage Electrical Maintenance Course will provide attendees with a comprehensive understanding and the details covered in this course are covered in NFPA 70B, Maintenance Standards. Understanding how to create a safe work environment, and to maintain High Voltage Electrical Equipment will fulfil requirements set out in Occupational Health and Safety Standards.

Learning Objectives:



- Review function and operation of electrical transformers
- Understand current transformer testing and application
- Identify switchgear tests, maintenance, and schedule for safety procedures
- Key steps for removal and restoration of a circuit breaker
- Application of CSA Z462 shock protection boundaries and their usage
- Tes(ting) procedures of electric motor, capacitor, emergency power system



Who Should Attend?

Job Titles : (HSSE Department)

- Fire Safety Officer
- Fire Prevention Engineer
- Fire Code Enforcers
- Fire and Safety Manager
- Safety Manager
- Risk Managers
- Loss Control Specialists
- Emergency Response Team
- HSSE Manager
- HSE Manager
- Law Enforcement Officials
- Fire Safety Consultants
- Facility Managers

(Operation Department)

- Electrical Engineers
- Maintenance Supervisor
- Maintenance Staff
- Engineering Managers
- Plant Managers
- Operation Managers
- HVAC Technicians
- Solar & Wind Generator Installers/Maintainers
- Contractors & Consultants

Industries

- Oil and Gas
- Chemicals
- Mining
- Manufacturing
- Automobiles
- Aviation
- Food & Beverages
- Healthcare
- Hospitality
- Construction
- IT and Finance
- Government





Instructor: **John Robin**

... your **EXPERT TRAINER** for
this Course..

John Robin, Power Systems Electrician – Electrical Safety and Maintenance Instructor.
For the past 25 years, have instructed more than 500 courses to a variety of industrial, commercial, and institutional companies across North America.

Have extensive Electrical Safety and Maintenance experience (40 years) working in the Pulp and Paper industry - starting as an operator in pulp production for 10 years, and then apprenticing as an Electrician.

He returned to school for Electrical upgrading, and became a Power Systems Electrician. For the last 24 years of his Pulp Mill career, he was the Lead Hand for the Mill power system. This comprised of 6 – 50 MVA power transformers – 138 to 13.8 kV, as well as 88 mill transformers reducing power to 2300 and 600 volts.

A parallel career in the Canadian Naval Reserve. From 1973 to 2000 I was attached to the Small Boat Training Unit at CFB Esquimalt, and Sea Cadet Training Establishment at HMCS Quadra, Comox, BC. I retired with the rank of Lieutenant Commander.

Since retiring from the Pulp Mill in 2012, I have continued teaching electrical safety and maintenance courses, delivering training to hundreds of various companies throughout North America, and since moving to Online training, the world.

Training courses include:

- Arc flash/Electrical Safety awareness and lock out standards (NFPA 70e and CSA Z462)
- Electrical Safety for Non-Electrical Workers and Operators
- High Voltage Electrical safety
- High Voltage Electrical Maintenance
- Electrical Maintenance Planning (NFPA 70B and CSA Z463)
- High Voltage Cable Splicing



Training Methodology

1. Pre-Course Preparation:
 - a. Pre-course questionnaire needs to be filled and submitted by the attendees before the online training. This will help the trainer to format the training as per attendees' understanding level and specific requirements.
 - b. Pre-course materials and assignments will be provided by the trainer before the online training. Attendees need to study the material and submit the assignments before entering the online classroom.
2. Real Time Virtual Training: This course in principle does not differ to the direct presentation and assessment (face to face training). In 4-day classroom immersion, all the material in the original syllabus will be presented online as well as the tests.
3. Live Interactive Sessions: Polling, Q&A round will be provided to interact with the trainer online. Trainer will also be available post course to interact with the attendees.
4. Videos & Exercises: Numerous videos will be shown throughout the course
5. Comprehensive Learning Kit: Trainer will provide course materials during/after the training which will be helpful for the attendees as the future reference in their continuous learning journey.



Day 1

09:00 - Pre-Course Intro – Delegate Expectation Briefing

Session 1: Insulation Materials and Testing Methods

- Review of insulation materials and the methods to diagnose insulation quality quickly and accurately
- Qualities of good insulation and factors affecting deterioration
- Methods of testing insulation and interpretation of test results

Session 2: Power Cable Splicing and Termination

- Cable
- Electrical code and splicing
- Difference between hot shrink stress cones and Cold shrink

- Construction of shielded and non-shielded cable
- Overview of Tape Products & Electrical Tape Utilization
- Overview of High Voltage Terminations
- How to perform a High Voltage Termination
- Overview of High Voltage Splicing & Pre-Molded Splicing
- How to perform a High Voltage Pre-Molded Splice
- Splicing procedure pamphlets will be supplied to delegates

Quiz

Videos – Heat shrink and Cold shrink procedures will be shown

Post-Session Q & A

13:00 – End of Day 1

Day 2

09:00 – Review of Day 1

Session 3: Power Transformer Testing

- Review: Function and operation of electrical transformers
- Interpret nameplate data
- Air cooled versus oil cooled; benefits and drawbacks
- Transformer protection systems
- Design and construction of power transformers
- Proper oil sampling methods
- Testing and scheduling maintenance procedures
- Electrical safety procedures for power transformers

Session 4: Instrument Transformer Testing

- Instrument transformer operation and application
- Current transformer operation and application
- Purpose of instrument transformers in metering

Session 5: Breakers and Switchgear

- Various types of power switchgear
- Difference between Switches and Breakers
- Operation of switchgear
- HV switchgear tests
- Switchgear maintenance and schedule plus safety procedures

Session 6: Circuit Breaker Maintenance

- Various types of circuit breakers
- Safety procedures critical to circuit breakers
- Correct steps for removal and restoration of a circuit breaker
- Operation of electrically operated circuit breaker controls
- Operation of circuit breaker mechanisms



Presentations:

Day 2

Session 7: Power Use

- Function of power fuses
- Various types of fuses
- Categories of fuses and protection principles

Quiz

Videos – Heat shrink and Cold shrink procedures will be shown

Post-Session Q &A

13:00 – End of Day 2

Day 3

09:00 – Review of Day 2

Session 8: Arc Flash and Electrical Safety

- Define the Flash Protection boundary
- Define the two CSA Z462 shock protection boundaries and describe their use
- Identify the key objectives of job safety planning
- List the personal protective equipment required for shock protection
- List the steps to install and remove temporary protective grounding equipment
- Planning exercises to create a safe work zone
- Identifying potential back feeds to a safe work zone
- Methods of isolating back feeds through planning exercises

Session 9: Protective Relays

- Principles and operation of protective devices.
- Power system disturbances
- Protective functions of various relays
- Types of protective relays, and their function

Session 10: Power System Co-ordination

- Principles of co-ordination of protective devices.
- Process of power system co-ordination

Quiz

Post-Session Q &A

13:00 – End of Day 3



Day 4

09:00 – Review of Day 3

Session 8: Electric Motor Testing

- Operation of large horsepower motors.
- Various types of electric motors
- Test procedures for motors
- Trouble shooting electrical motor failures
- Maintenance testing of electric motors

Session 9: Capacitor Testing

- Operation of high voltage capacitors.
- Various types of capacitor installations
- Safety procedures critical to capacitors

Session 10: Emergency Power System Testing

- Operation of various high voltage emergency power systems.
- Various types of emergency systems: batteries, transfers, ties, temporary etc.
- Maintenance and care of Battery banks for power systems
- Test procedures for operation of these system
- Maintenance and schedule for emergency systems

Test

Post-Session Q &A (Day 1 – 4)

13:00 – End of Day 4 & Course



Does BII Online Virtual Training have the same value as traditional classroom training?

Yes, BII Online Virtual Training offers participants; same training system as in-person, i.e face-to-face engagement with instructors, course material, interactive participation of all delegates, and personal support that they would expect to find in a traditional classroom.

What are main features of your online courses? Are they on-demand? Is it different content from the in-person offering?

The content of the virtual training is similar to the in-person sessions and customized presentation makes it a richer online learning experience. As always, we will share presentation materials with attendees for later reference.

The online courses are not on-demand and recordings cannot be purchased. They are set on scheduled dates, live with an instructor and co-host via webinar software. While the day is shorter than an in-person session (4hrs vs 8hrs), timing are adjusted to accommodate attendees in different time zones and allow more time for one-on-one conversations via the Q & A.

What are the technical requirements for participation in a virtual course?

All you need to participate in virtual training are:

- Desktop or Laptop or Tablet Computer, and Internet connection
- Webcam
- Headset with built-in microphone

Can I attend an online training session if I have a Macintosh computer?

Yes, Our Online training systems does allow Macintosh computers, PCs, and computers running Linux to easily enter any of our online training sessions.

What type and version of browser will I need for online classes?

It is recommended that you use the latest version of Firefox, Chrome or Internet Explorer for Windows and Firefox or Safari for Mac. Each of these is available for free download and also suggested you have the PDF Reader

How do I have access to the trainer for questions?

As in the classroom, you will see the trainer in front of you and have the opportunity to ask questions at any time - all via audio and video transmission.

Is there a mute option within an online training session to minimize background noise from my audio connection?

Yes, the Mute button will display to the right of your name as you hover your mouse over your name shown in the Participants panel on the top, right side of the Web conferencing screen.

What if I miss few sessions of the online training program?

The training will be simultaneously recorded which will be provided to you as per request & requirement

Do I get a Certificate at the end?

Yes, you will get a PDF version of your certificate of completion



