COURSE OVERVIEW EE0198

API SIEE: Source Inspector - Electrical Equipment

(API Exam Preparation Training)

Course Title

API SIEE: Source Inspector - Electrical Equipment *(API Exam Preparation Training*)

Course Date/Venue

April 28-May 02, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE, Dubai, UAE

Exam Window: July 12-August 02, 2024
Exam Venue : Abu Dhabi, Dubai, Al-Khobar, Jeddah, Kuwait, Amman, Beirut, Cairo, Manama & Muscat. Participant has the option to attend at any of the above cities

Exam Registration Closing Date: May 03, 2024

Course Duration/Credits

Five days/4.0 CEUs/40 PDHs

Course Reference

EE0198

Course Description

This practical and highly-interactive course includes practical sessions and exercises where participants carryout welding inspection. Theory learnt in the class will be applied using our state-of-the-art simulators.

This course is designed to provide delegates with a detailed and up-to-date overview of API Source Inspector Electrical Equipment (SIEE). It covers the source inspection management program and project specific source inspection planning activities; the source inspection project plan, test plan, performance and project continuous improvement; the examination methods, tools and equipment; the dimensional inspections, visual inspections and typical electrical testing techniques; and the functional testing and surface preparation or coatings inspections.

During this interactive course, participants will learn the manufacturing and fabrication processes; the electrical skid mounted equipment; the liquid immersed transformers and low and medium voltage switchgear; the low to medium voltage motor control centers; the electrical induction motors, test and inspections, motor testing and visual and mechanical inspection; the final inspection and shipping preparations; and the electrical inspection tools and test equipment.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Get prepared for the next API SIEE exam and have enough knowledge and skills to pass such exam in order to get the API SIEE certification
- Discuss source inspection management program and project specific source inspection planning activities
- Develop source inspection project plan and test plans
- Carryout source inspection performance and project continuous improvement
- Recognize examination methods, tools and equipment
- Apply dimensional inspections, visual inspections, typical electrical testing techniques, functional testing and surface preparation/coatings inspections
- Illustrate manufacturing and fabrication (M&F) processes and identify electrical skid mounted equipment
- Discuss liquid-immersed transformers and low and medium voltage switchgear
- Recognize low to medium voltage motor control centers covering design and construction standards, MCC design, enclosure types, circuit breakers, bus material, Amp capacity, main feeder cable entry compartment, ground bus and main isolating switch
- Identify electrical induction motors as well as apply test and inspections, motor testing, visual and mechanical inspection and final inspection and shipping preparations
- Recognize electrical inspection tools and test equipment

Who Should Attend

This course provides an overview of all significant aspects and considerations of API source inspector electrical equipment (SIEE) for electrical inspectors, quality control professionals, engineers, and technicians who are involved in the inspection, testing, and certification of electrical equipment. This includes those who work in industries such as oil and gas, power generation, petrochemical, and aerospace, among others and those who are interested in becoming certified API SIEE inspectors, or those who are required to have this certification as part of their job responsibilities, should attend these courses. Additionally, individuals who are seeking to enhance their knowledge and skills in the area of electrical equipment inspection may also find these courses beneficial.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Exam Eligibility & Structure

Exam Candidates shall have the following minimum pre-requisites:-

Education	Years of Experience	Experience Required
High School Diploma/GED (equivalent)	5 years	• Electrical inspection experience • Non-inspection electrical experience • General inspection with some electrical experience • Journeymen and Master Electrician would qualify under 5 years
High School Diploma/GED (equivalent) + SIFE or SIRE	3 years	• Electrical inspection experience • Non-inspection electrical experience • General inspection with some electrical experience
4-year Military Experience *(Dishonorable discharge disqualifies credit)*	3 years	• Electrical inspection experience • Non-inspection electrical experience • General inspection with some electrical experience
2-year Electrical/Electronic Technology degree/certificate	3 years	• Electrical inspection experience • Non-inspection electrical experience • General inspection with some electrical experience
4-year Military Experience with 2 years of Electrical/Electronic MOS (Military operations specialty code) *(Dishonorable discharge disqualifies credit)*	2 years	• Electrical inspection experience • Non-inspection electrical experience • General inspection with some electrical experience
BS in Electrical/Electronic Engineering	2 years	• Electrical inspection experience • Non-inspection electrical experience • General inspection with some electrical experience

1. Electrical Inspection - Oil & Gas, power, nuclear, military, commercial, residential, utility, industrial inspection

- Electrical skid mounted equipment
- Transformers
- Switchgears
- Medium voltage switchgears
- Electrical induction motors 500 HP and larger

2. Non-inspection Electrical Experience - Oil & Gas, power, nuclear, military, commercial, residential, utility, industrial experience

- Electricians working in power plants including nuclear, fossil fuels and renewables
- Electrical engineers and technicians with manufacturing, construction, maintenance or commissioning experience, with a focus on electrical/industrial power
- Licensed Electrical Journeyman
- Licensed Master Electrician
- Experience working with transformers and switchgears
    - Includes: Traction Power Technician, Substation Engineer, Relay Engineer/Technician, Groundman, Electrical-Industrial Journeyman, Electrical Testing & Commissioning Specialist
    - Excludes: Lineman, Power Line Technician, Journeyman Lineman, Line Installers and Repairers, unassigned lineman (UAL), Line Mechanic

3. General Inspection with some Electrical Experience - skid packages, definable experience with electrical

- Source Inspectors of Fixed or Rotating Equipment with Electrical Experience

Required Codes & Standards

Listed below are the effective editions of the publications required for this exam for the date(s) shown above. **Each participant must purchase these documents separately and have them available for use during the class as their cost is not included in the course fees**:-

API Documents

- **Guide for Source Inspection and Quality Surveillance of Electrical Equipment**
  - *Entire document is subject to testing.*
- **API Recommended Practice 540**, *Electrical Installations in Petroleum Processing Plants*, 4th Edition, April 1999, Reaffirmed August 2013
  - *Only Sections 1, 2 and 8 are subject to testing*.
- **API Standard 541,** *Form-wound Squirrel Cage Induction Motors- 375 kW (500 Horsepower) and Larger*, 5th Edition, December 2014, Reaffirmed May 2021
  - *Entire document is subject to testing with the exception of the annexes*.
- **API Recommended Practice 14F**, *Design, Installation, and Maintenance of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class 1, Division 1 and Division 2 Locations*, 6th. Edition, October 2018
  - *Entire document is subject to testing*.
- **API Recommended Practice 14FZ**, Design, Installation, and Maintenance of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Zone 0, Zone 1, and Zone 2 Locations, 2nd Edition, Reaffirmed April 2020
  - *Only Sections 1, 3 and 6 are subject to testing*

Institute of Electrical and Electronics Engineers (IEEE)

- **IEEE 141**, Recommended Practice for Electric Power Distribution for Industrial Plants, 1993 Edition, 1993
  - *Only Sections 1 and 10 are subject to testing*
- **IEEE 841**, *Standard for Petroleum and Chemical Industry--Premium-Efficiency, Severe-Duty, Totally Enclosed Squirrel Cage Induction Motors from 0.75 kW to 370 kW (1 hp to 500 hp),* 2021 Edition, May 2021
  - *Only Sections 1, 5, 6, 8, 9 and 10 and Annex 1 are subject to testing*
- **IEEE C37.20.1a**, *Metal-Enclosed Low-Voltage (1000 V ac and below, 3200 V dc and below) Power Circuit Breaker Switchgear – Amendment 1: Control and Secondary Circuits and Devices, and All Wiring*, 2020 Edition, May 2020
  - *Only Sections 5-7 are subject to testing*
- **ANSI/IEEE C37.20.3**, *Metal-Enclosed Interrupter Switchgear (1 kV–38 kV),* 2013 Edition, December 2013
  - *Only Section 7 is subject to testing*
- **ANSI/IEEE C57.12.00**, *General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers*, 2021 Edition, January 2022
  - *Only Sections 4-6 and 9 are subject to testing.*

National Electrical Manufacturers Association (NEMA)

- **NEMA ICS 1**, *Industrial Control and Systems: General Requirements*, 2000 Edition, Reaffirmed 2015
  - *Sections 1 through 8 and Annex A are subject to testing. All other annexes are excluded*
- **NEMA ICS 2**, *Controllers, Contactors and Overload Relays Rated 600 V*, 2000 Edition, Reaffirmed 2020
  - *Sections 1, 6 8 & 9 are subject to testing*

- **NEMA ICS 3**, *Medium Voltage Controllers Rated 2,001 to 7,200 V AC,* 2005 Edition, Reaffirmed 2010
  - *Entire document issubject to testing.*
- **NEMA ICS 19**, *Diagrams, Device Designations and Symbols,* 2002 Edition, Reaffirmed 2022
  - Entire document is subject to testing
- **NEMA MG-1**, *Motors and Generators,* 2021 Edition
  - *Only Section 1 (Parts 1 and 7), Section III (Part 20) and Section IV (Part 30) are subject to testing*

International Electrical Testing Association (NETA)

- **NETA ATS**, *Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems*, May 2017
  - *Only Sections 4, 5 and 7 are subject to testing*.

National Fire Protection Association (NFPA)

- **NFPA 70**, *National Electrical Code,* 2020 Edition
  - *Chapters 1 through 4, and Chapter 5, Sections 500-506 are subject to testing*
- **NFPA 70E**, *Standard for Electrical Safety in the Workplace,* 2021 Edition
  - *Only the Introduction and Chapter 1 and Chapter 3, sections 300-340 are subject to testing.*

Note: **API and ASME publications are copyrighted material. Photocopies of API and ASME publications are not permitted. CD-ROM versions of the API documents are issued quarterly by Information Handling Services and are allowed. Be sure to check your CD-ROM against the editions noted on this sheet**.

Training Fee

US$ 7,500 per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), buffet lunch, coffee/tea on arrival, morning & afternoon of each day

Exam Fee

US$ 620 per Delegate.

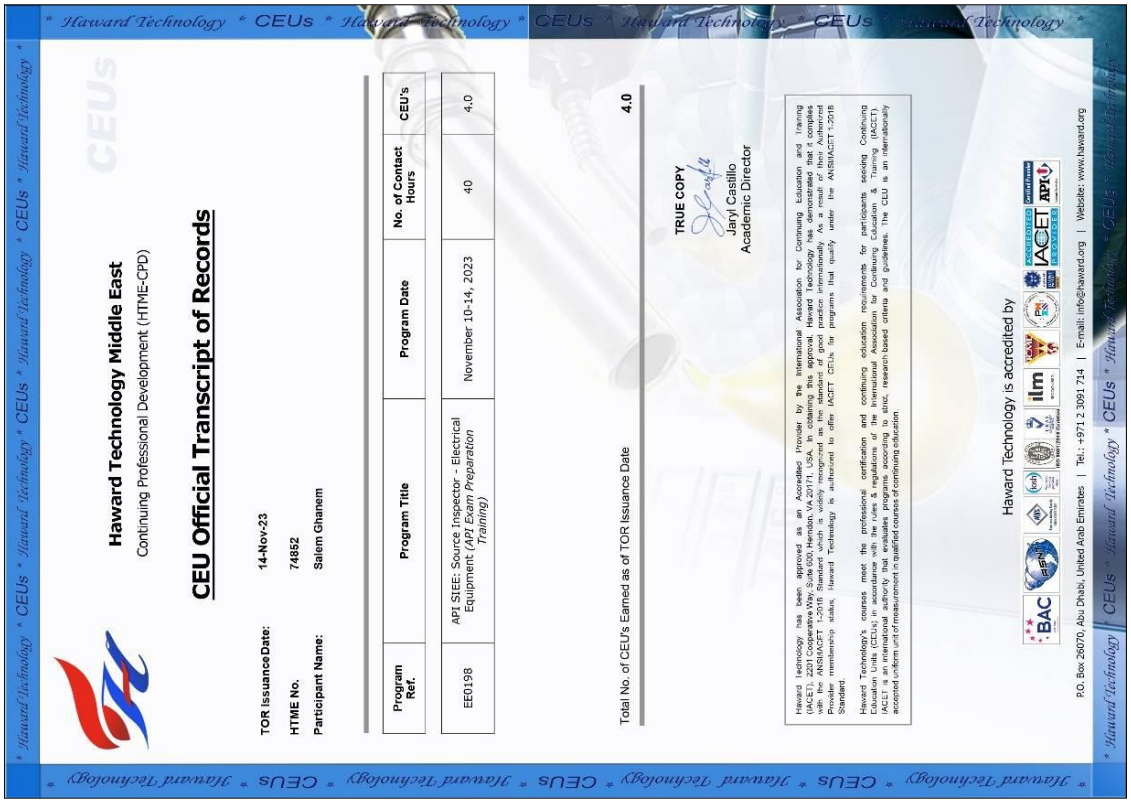
Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

API Certificate(s)

(1) API-SIEE certificate will be issued to participants who have successfully passed the API-SIEE examination.

(2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.



Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:

- The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **4.0 CEUs** (Continuing Education Units) or **40 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

- British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Ahmed Alaa, MSc, BSc, API-SIEE is a **Senior Electrical & Instrumentation Engineer** with extensive years of experience within the **Oil**, **Gas**, **Petrochemical**, **Refinery** & **Power** industries. His expertise widely covers in the areas of API Source Inspector Electrical Equipment, Electrical Equipment Inspection, **HV/MV Cable Splicing**, **Cable & Over Head Power Line**, **HV/MV Switchgear, HV Cable** Design, **Cable** Splicing & Termination, **High Voltage Electrical Safety**, **Medium & High Voltage Equipment**, **High Voltage Circuit Breaker** Inspection & Repair, **High Voltage Power** System, **HV Equipment** Inspection & Maintenance, **HV Switchgear** Operation & Maintenance, Resin / **Heat Shrink & Cold Shrink** Joints, **HV/LV Equipment**, **LV & HV Electrical System**, **LV**, **MV & HV Cable** Installations & Properties, ORHVS for Responsible and Authorized Person **High Voltage Regulation**, **Transformers** Maintenance, inspections & repairs, Commissioning of **LV & HV Equipment**, Electrical Transient Analysis Program (ETAP), Programmable Logic Control (**PLC**), PLC for Process Control & Automation, Programmable Logic Controller (**PLC**) Operations, Maintenance and Troubleshooting, Programmable Logic Controllers (**PLC**), **PLC** Basics to Advanced Application, Power Management System (**PMS**), Variable Speed Drive (**VSD**), Advanced **ABB VSD** Controllers, **VSD** commissioning and troubleshooting, Power Management System (PMS), Marine Vessel Power Management Systems, Electrical Equipment & Control System, Ex Equipment, **Power System Operation and Control**, Fault Analysis in **Power Systems**, **LV & MV** Electric Power Systems for Industrial Plants, Electric Power System Operation, **Electric Motors & Variable Speed Drives**, **Electric Motor** Selection, Maintenance & Control, **Motor Operation & Maintenance**, **Electric Motor Protection**, **UPS** and **Battery** System, **UPS & Battery** Design, Operation, Maintenance & Troubleshooting, **UPS, DC System & Battery** Design, Operation, Maintenance & Troubleshooting Testing & Maintenance, Installing and Testing **Electric Wires & Cables**, Cable Jointing Appreciation, **Circuit Breaker & Switchgear**, **Transformer & Circuit Breakers** Testing & Maintenance and **Motor Control Circuit** Troubleshooting.

During Mr. Ahmed's career life, he has gained his practical experience through several significant positions and dedication as the **Senior Electrical Engineer**, **Electromechanical Engineer**, **Electrical Maintenance Engineer**, **Electrical Instructor** and **Instructor/Trainer** from various companies like the Khalda Petroleum Company, Qarun Petroleum Company, Arab Contractor Company and Uniplast Company.

Mr. Ahmed has a **Bachelor's** degree in **Electrical Engineering**. Further, he is a **Certified Instructor/Trainer** and a **Certified API Source Inspector Electrical Equipment** (**SIEE**). He has further delivered numerous trainings, courses, workshops, seminars and conferences internationally.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: ***Sunday 28th of April 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 1000	***Introduction to API Source Inspector Electrical Equipment (SIEE)***
1000 – 1015	*Break*
1015 – 1230	***Source Inspection Management Program***
1230 – 1330	*Lunch*
1330 – 1515	***Project Specific Source Inspection Planning Activities*** *Equipment Risk Assessment • Development of a Source Inspection Project Plan • Development of Inspection & Test Plans*
1515 – 1530	*Break*
1530 – 1650	***Project Specific Source Inspection Planning Activities (cont'd)*** *Selection of an Inspector • Coordination of Inspection Events • Report Review*
1650 – 1700	***Recap***
1700	*End of Day One*

Day 2: ***Monday 29th of April 2024***

0730 – 0830	***Review of Day 1***
0830 – 1000	***Source Inspection Performance*** *Inspector Conduct & Safety • Review of Project Documents • Performing the Source Inspection • Source Inspection Work Process Scheduled Planning Events*
1000 – 1015	*Break*
1015 – 1230	***Source Inspection Performance (cont'd)*** *Report Writing • Nonconformance/Deviations • Source Inspection Project Continuous Improvement • Source Inspector Continuous Improvement*
1230 – 1330	*Lunch*
1330 – 1515	***Examination Methods, Tools & Equipment*** *Review & Confirmation of Materials of Construction • Dimensional inspections • Visual Inspections*
1515 – 1530	*Break*
1530 – 1615	***Examination Methods, Tools & Equipment (cont'd)*** *Typical Electrical Testing Techniques • Functional Testing • Surface Preparation/Coatings Inspections*
1615 – 1650	***Quiz 1***
1650 – 1700	***Recap***
1700	*End of Day Two*

Day 3: ***Tuesday 30th of April 2024***

0730 – 0830	***Review of Day 2***
0830 – 1000	***Final Acceptance*** *Reviewing final S/V Data*
1000 – 1015	*Break*
1015 – 1230	***Manufacturing & Fabrication (M&F) Processes***
1230 – 1330	*Lunch*

1330 – 1515	***Electrical Skid Mounted Equipment*** *General • Packaged, Pre-Engineered & Custom Skids • Electrical Equipment for Hazardous (Classified) Locations • Purged & Pressurized in a (Classified) Location • Cable Support Systems • Equipment Grounding*
1515 – 1530	*Break*
1530 – 1650	***Electrical Skid Mounted Equipment (cont'd)*** *AC Control Wiring • Industry Codes & Standards • Material of Construction • Inspection & Testing • Final Acceptance & Shipping Preparations*
1650 – 1700	***Recap***
1700	*End of Day Three*

Day 4: ***Wednesday 01st of May 2024***

0730 – 0830	***Review of Day 3***
0830 – 1000	***Liquid -Immersed Transformers*** *Basic Transformer Knowledge • Basic Construction • Design & Construction • Industry Codes & Standards • Test & Inspections • Final Inspection & Shipping Preparations*
1000 – 1015	*Break*
1015 – 1230	***Switchgear (Low & Medium Voltage)*** *Basic Switchgear Knowledge • Design & Construction • Ratings • Interlocks • LV Switchgear Grounding • LV AC Switchgear Grounding • Wiring*
1230 – 1330	*Lunch*
1330 – 1515	***Switchgear (Low & Medium Voltage) (cont'd)*** *Housing Frames & Enclosure Compartment • Switchgear Section Compartments • Switchgear Compartment Doors • Bus Compartment • Circuit Breakers • Electric Tie Breakers*
1515 – 1530	*Break*
1530 – 1615	***Switchgear (Low & Medium Voltage) (cont'd)*** *Current Transformers • Voltage Transformers • Control Power Transformers • Metering • Test & Inspections • Final Inspection & Shipping Preparations*
1615 – 1650	***Quiz 2***
1650 – 1700	***Recap***
1700	*End of Day Four*

Day 5: ***Thursday 02nd of May 2024***

0730 – 0830	***Review of Day 4***
0830 – 1000	***Motor Control Centers (Low to Medium Voltage)*** *Basic Motor Control Center Knowledge • Design & Construction Standards • Material of Construction • Key Items Determine the MCC Design • Enclosure Types • Circuit Breakers • Bus Material*
1000 – 1015	*Break*
1015 – 1215	***Motor Control Centers (Low to Medium Voltage) (cont'd)*** *Amp Capacity • Main Feeder Cable Entry Compartment • Ground Bus • Main Isolating Switch • Test & Inspections • Final Inspection & Shipping Preparations*
1215 - 1315	*Lunch*

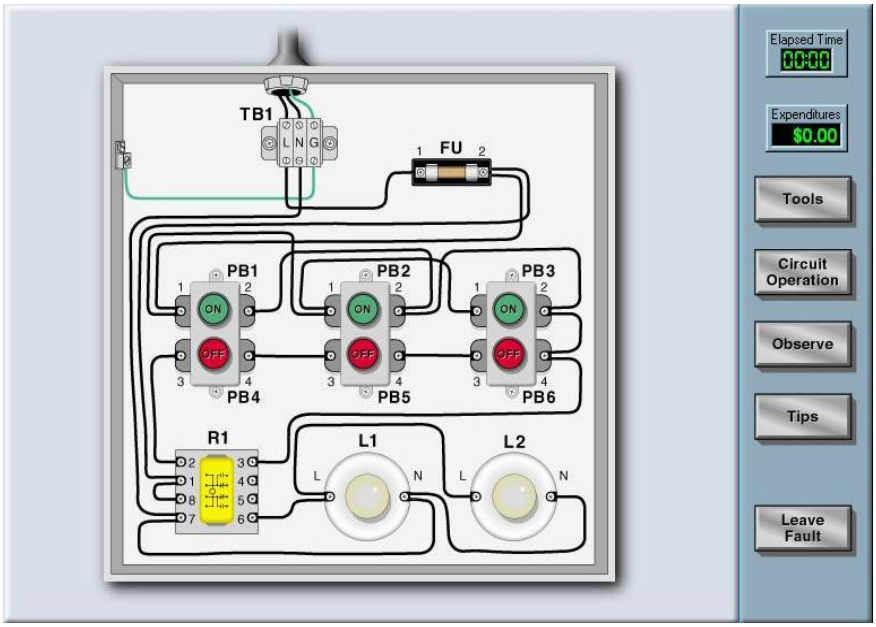
1315 - 1530	***Electrical Induction Motors*** *General Induction Motor Knowledge • Design & Construction Standards • Materials of Construction • Test & Inspections • Motor Testing • Visual & Mechanical Inspection • Final Inspection & Shipping Predations*
1530 - 1545	*Break*
1545 - 1615	***Electrical Inspection Tools & Test Equipment***
1615 - 1630	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1630 – 1645	***POST-TEST***
1645 – 1700	*Presentation of Course Certificates*
1700	*End of Course*

MOCK Exam

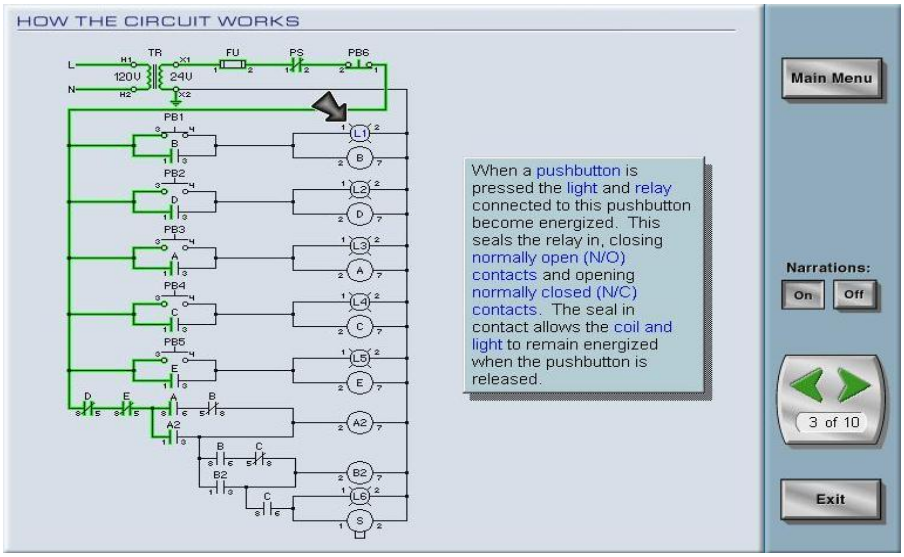
Upon the completion of the course, participants have to sit for a MOCK Examination similar to the exam of the Certification Body through Haward's Portal. Each participant will be given a username and password to log in Haward's Portal for the MOCK Exam during the 7 days following the course completion. Each participant has only one trial for the MOCK exam within this 7-day examination window. Hence, you have to prepare yourself very well before starting your MOCK exam as this exam is a simulation to the one of the Certification Body.

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art simulators “Troubleshooting Electrical Circuits V4.1”, Power World” and “ETAP software”.

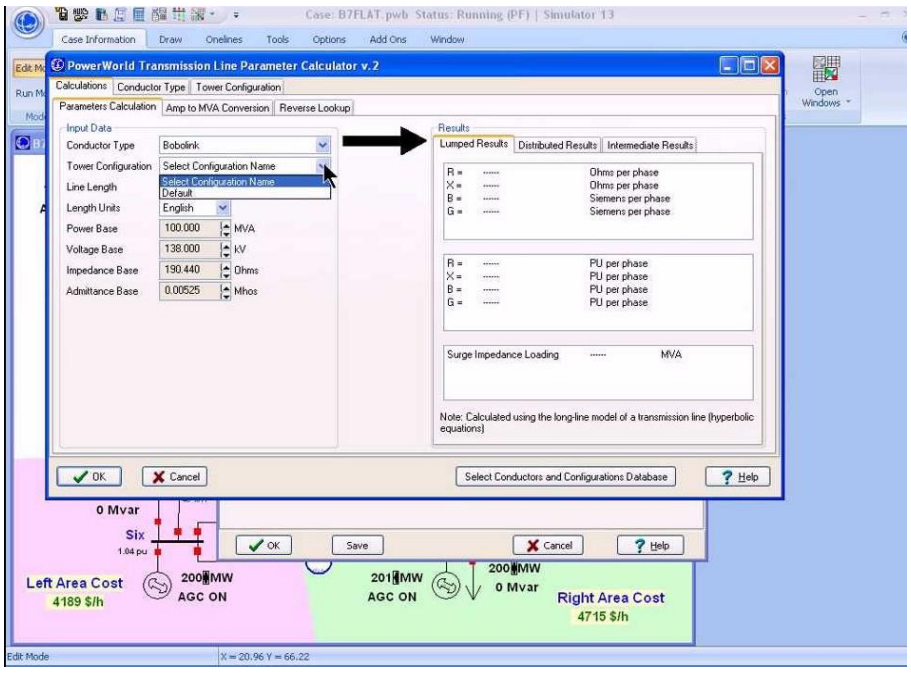


Basic Techniques

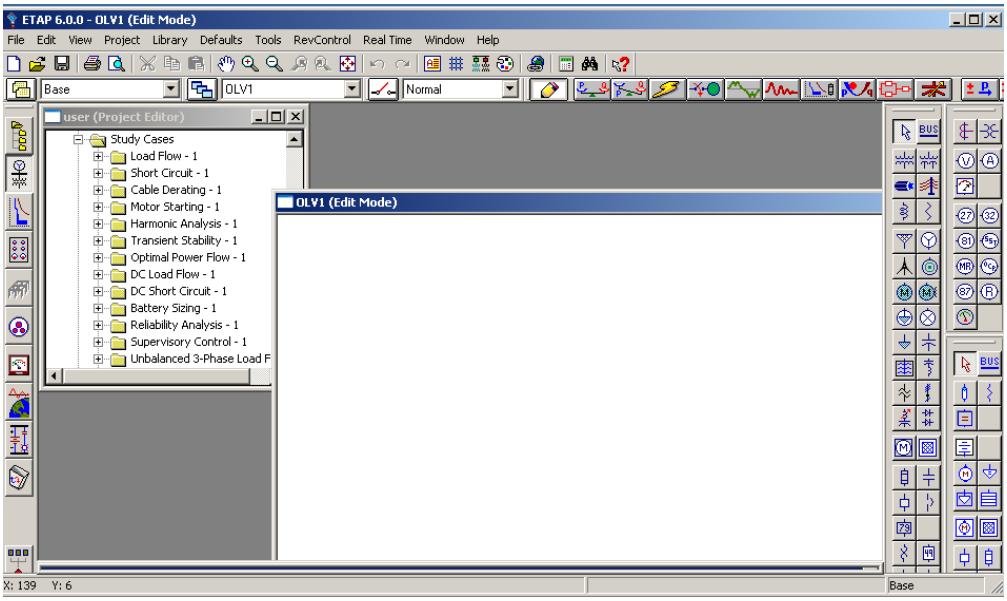


Basic Control Circuits

Motor Control Techniques



Power World Simulator



ETAP Software Simulator

Course Coordinator

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