COURSE OVERVIEW EE0331(OA1)
Control Panel Design & Construction

Course Title
Control Panel Design & Construction

Course Date/Venue
Session 1: April 07-11, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: September 28-October 02, 2025/ Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
EE0331(OA1)

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

Control panel design and construction in the oil and gas industry require precision engineering to ensure safe and efficient operation of critical processes. These panels house electrical and instrumentation components for monitoring, controlling, and automating systems such as drilling, production, and pipeline operations. Designed to withstand harsh environments, they must comply with industry standards like IEC, NEC, and ATEX for hazardous locations. Key considerations include explosion-proof enclosures, fail-safe mechanisms, and remote monitoring capabilities to enhance safety and reliability in upstream, midstream, and downstream applications.

This course is designed to provide participants with a detailed and up-to-date overview of Control Panel Design & Construction. It covers the the symbols and describe the abbreviations related to electric circuit drawing and control panel fault; the block, circuit, wiring diagrams and layouts; the circuit logic and analyze circuit drawings; the safe isolation procedures; the logical sequences in fault diagnosis and location; the insulation and continuity testing; and finding fault on a component system comprising of contractors, overload units, timers, relays, switches, breakers, motor starters, variable speed drives and fuses related to pumps, compressors and generators.

Course Objectives

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

- Apply and gain an in-depth knowledge on electric circuit drawing interpretation and control panel fault
- Identify the symbols and describe the abbreviations related to electric circuit drawing and control panel fault
- Illustrate block, circuit, wiring diagrams and layouts
- Follow circuit logic and analyze circuit drawings
- Demonstrate safe isolation procedures
- Recognize logical sequences in fault diagnosis and location
- Carryout insulation and continuity testing
- Find fault on a component system comprising of contractors, overload units, timers, relays, switches, breakers, motor starters, variable speed drives and fuses related to pumps, compressors and generators

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides a basic overview of all significant aspects and considerations of control panel design and construction for. electrical engineers and technicians, automation and control system engineers, maintenance personnel, project managers and supervisors, electrical contractors and designers, students and recent graduates and those who involved in the practical aspects of electrical control system design and construction.

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.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:-

- 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.

- 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 **3.0 CEUs** (Continuing Education Units) or **30 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.

Accommodation

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

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

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:

Dr. Ahmed El-Sayed, PhD, MSc, BSc, is a **Senior Electrical & Instrumentation Engineer** with over **35 years** of extensive experience in the **Power**, **Petroleum**, **Petrochemical** and **Utilities**. He specializes in **HV/LV Equipment**, **High Voltage Electrical Safety**, **LV & HV Electrical System**, **HV Equipments Inspection & Maintenance**, **HV Switchgear Operation & Maintenance**, **LV Distribution Switchgear & Equipment**, **HV Switchgear Maintenance**, **HV/LV Electrical** Authorisation, **Hazardous Area Classification, Power Quality**, **Disturbance Analysis**, **Blackout**, **Power Network**, **Power Distribution**, **Power Systems Control**, **Power Systems Security**, Power **Electronics**, **ETAP**, Electrical **Substations**, Tariff Design & Structure Analysis, **Engineering Drawings, Codes & Standards**, **P&ID Reading, Interpretation & Developing**, **PLC**, **SCADA**, **DCS**, **Process Control**, **Instrumentation**, **Automation**, Power **Generation**, **Process Control Instrumentation**, **SIS**, **SIL**, **ESD**, **Alarm Management Systems**, **Fieldbus Systems** and **Fiber Optics** as well as the service pricing of these. He is currently the **Systems Control Manager** of **Siemens** where he is in-charge of Security & Control of Power **Transmission Distribution** & **High Voltage** Systems and he further takes part in the Load Records Evaluation & Transmission Services Pricing.

During his career life, Dr. Ahmed has been actively involved in different Power System Activities including Roles in Power System Planning, Analysis, Engineering, **HV Substation** Design, Electrical Service Pricing, Evaluations & Tariffs, Project Management and also in Teaching and Consulting. His vast industrial experience was honed greatly when he joined many International and National Companies such as **Siemens**, **Electricity Authority** and **ACETO** industries where he focused more on dealing with Technology Transfer, System Integration Process and Improving Localization. He was further greatly involved in manufacturing some of **Power System** and **Control & Instrumentation Components** such as Series of Digital Protection **Relays**, MV **VFD**, **PLC** and **SCADA** System with intelligent features.

Dr. Ahmed is well-versed in different electrical and instrumentation fields like Load Management Concepts, **PLC** Programming, Installation, Operation and Troubleshooting, **AC Drives** Theory, Application and Troubleshooting, Industrial Power Systems Analysis, AC & DC **Motors**, Electric Motor **Protection**, **DCS SCADA**, **Control** and Maintenance Techniques, Industrial Intelligent Control System, **Power Quality** Standards, Power Generators and Voltage Regulators, Circuit Breaker and Switchgear Application and Testing Techniques, **Transformer** and **Switchgear** Application, Grounding for Industrial and Commercial Assets, Power Quality and **Harmonics**, **Protective Relays** (O/C Protection, Line Differential, Bus Bar Protection and **Breaker Failure Relay**) and Project Management Basics (PMB).

Dr. Ahmed has **PhD**, **Master's** & **Bachelor's** degree in **Electrical** and **Instrumentation Engineering** from the **University of Wisconsin Madison**, **USA**. Further, he has numerous papers published internationally in the areas of Power Quality, Superconductive Magnetic Energy Storage, SMES role in Power Systems, Power System **Blackout** Analysis, and Intelligent Load Shedding Techniques for preventing Power System Blackouts, HV **Substation Automation** and Power System Stability.

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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Symbols and Abbreviations***
0930 – 0945	*Break*
0945 – 1100	***Symbols and Abbreviations (cont'd)***
1100 – 1230	***Block Diagrams***
1230 – 1245	*Break*
1245 - 1430	***Block Diagrams (cont'd)***
1430	*Lunch & End of Day One*

Day 2

0730 – 0900	***Circuit Diagrams***
0900 – 0915	*Break*
0915 – 1100	***Circuit Diagrams (cont'd)***
1100 – 1230	***Wiring Diagrams and Layouts***
1230 – 1245	*Break*
1245 – 1430	***Wiring Diagrams and Layouts (cont'd)***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Following Circuit Logic***
0930 - 0945	*Break*
0945 – 1100	***Following Circuit Logic (cont'd)***
1100 – 1215	***Analyzing Circuit Drawings***
1215 – 1230	*Break*
1230 - 1430	***Analyzing Circuit Drawings (cont'd)***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Safe Isolation Procedures***
0930 - 0945	*Break*
0945 – 1100	***Safe Isolation Procedures (cont'd)***
1100 – 1215	***Logical Sequences in Fault Diagnosis and Location***
1215 – 1230	*Break*
1230 - 1430	***Logical Sequences in Fault Diagnosis and Location (cont'd)***
1430	*Lunch & End of Day Four*

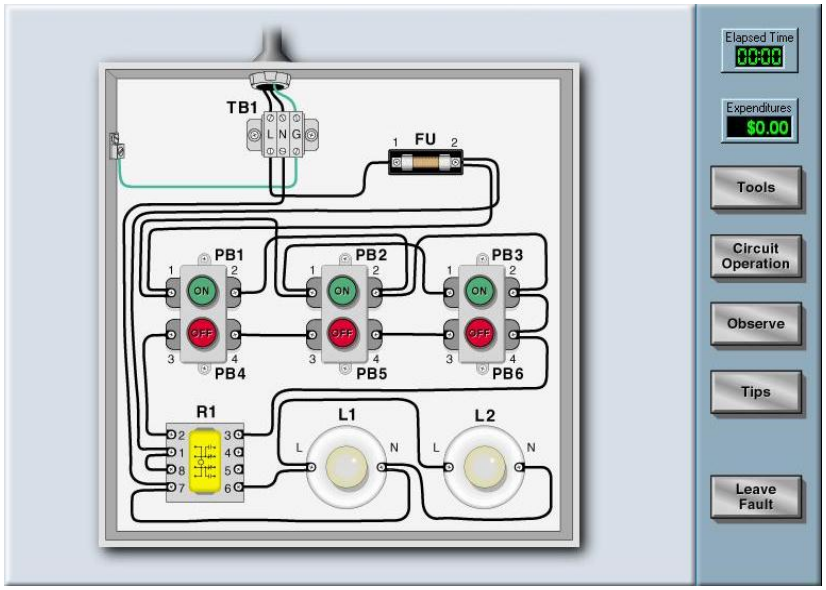
Day 5

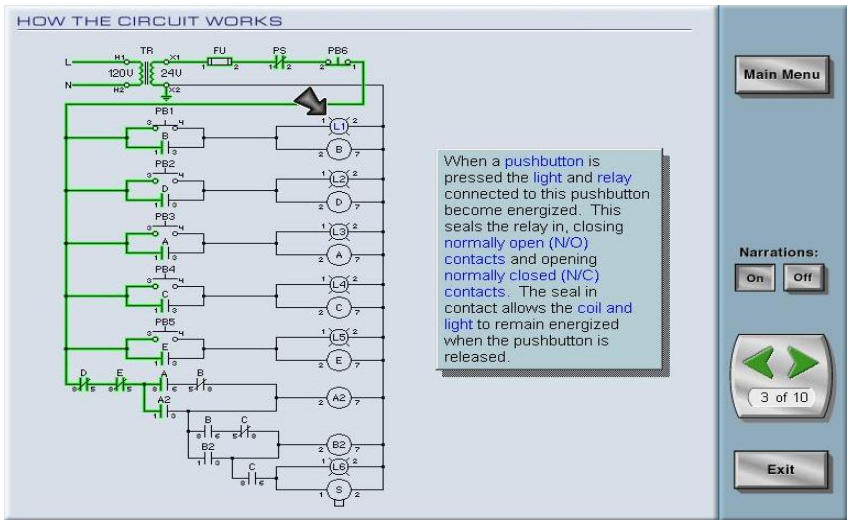
0730 – 0930	***Insulation and Continuity Testing***
0930 - 0945	*Break*
0945 – 1100	***Insulation and Continuity Testing (cont'd)***
1100 – 1215	***Practical Fault Finding on Component Systems*** *Contractors ● Overload Units ● Timers ● Relays ● Switches ● Breakers*

1215 – 1230	*Break*
1230 - 1400	***Practical Fault Finding on Component Systems (cont'd)*** *Motor Starters ● Variable Speed Drives and Fuses Typically Used for Pumps ● Compressors ● Generators*
1400 - 1415	***POST-TEST***
1415 - 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

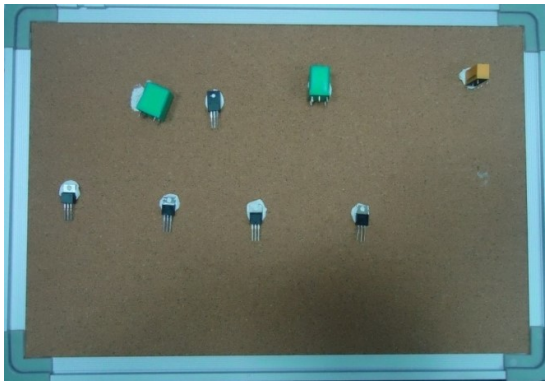
Simulators (Hands-on Practical Sessions)

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 “Haward Troubleshooting”, “Haward Electric & Control Board” and “Switchgear” simulators.

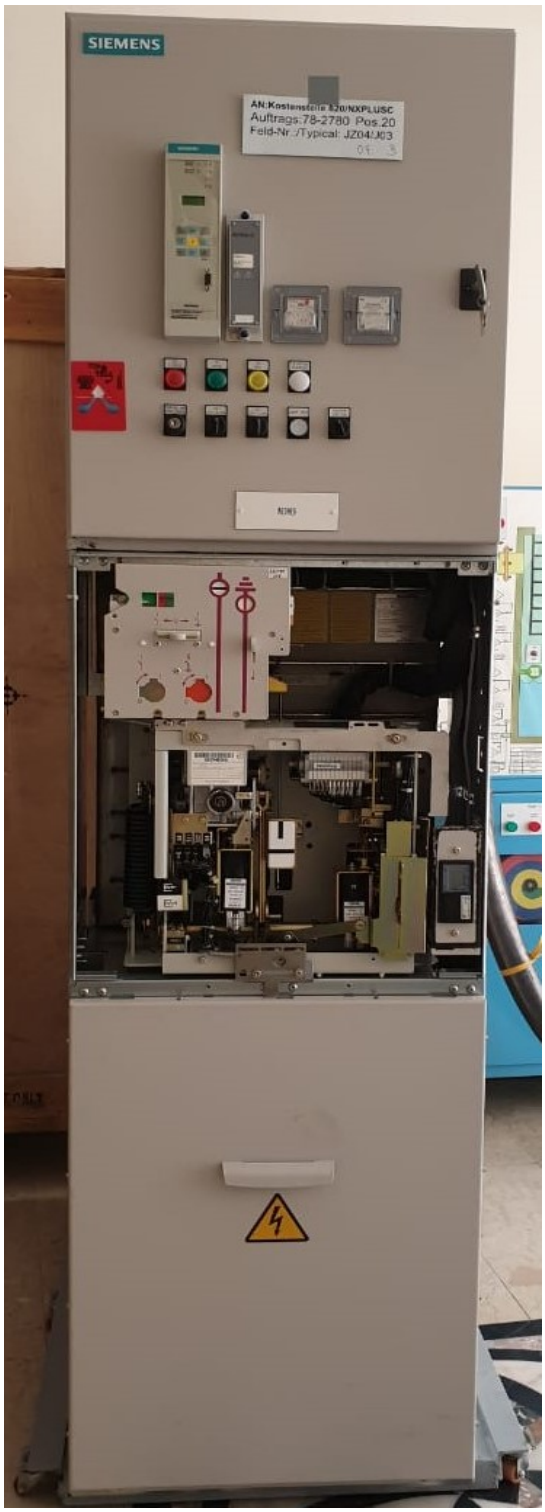


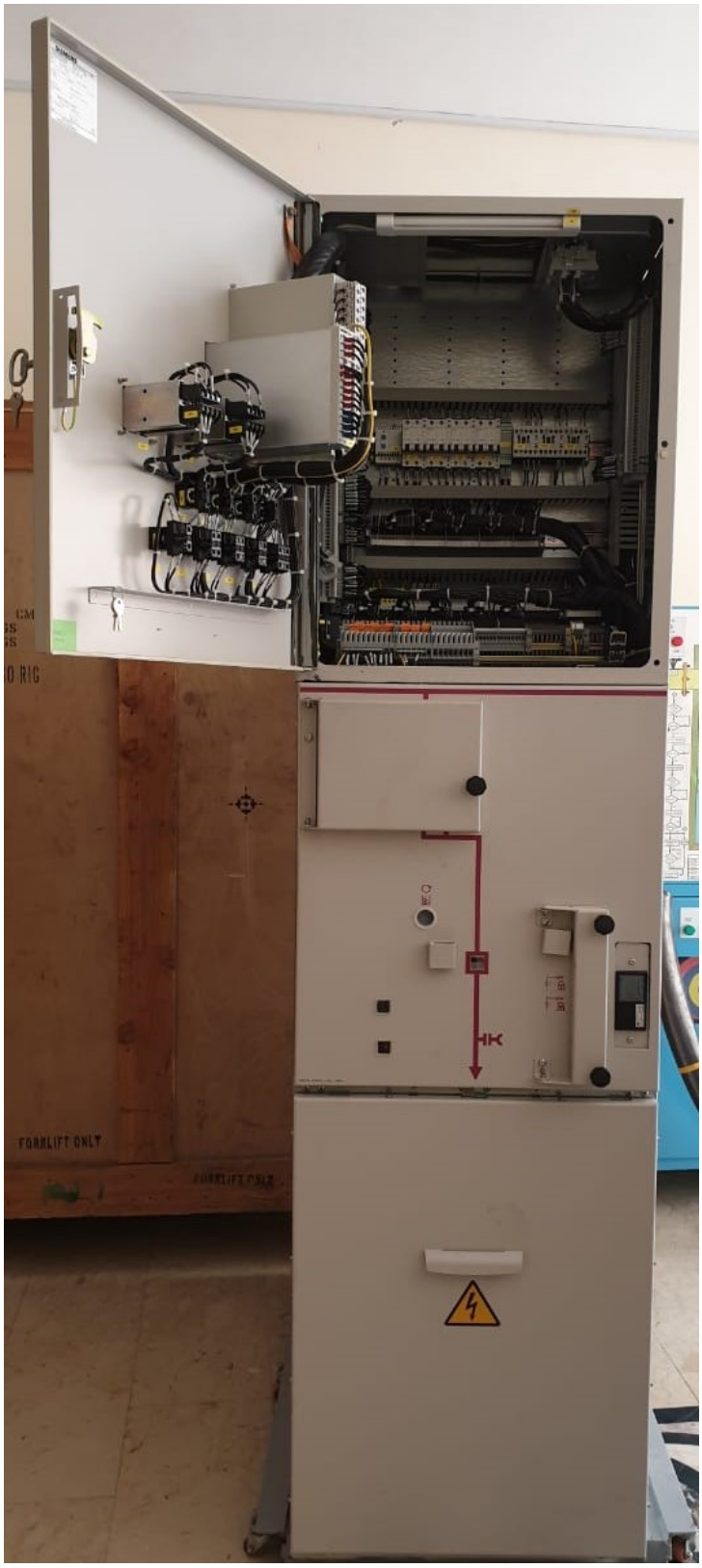


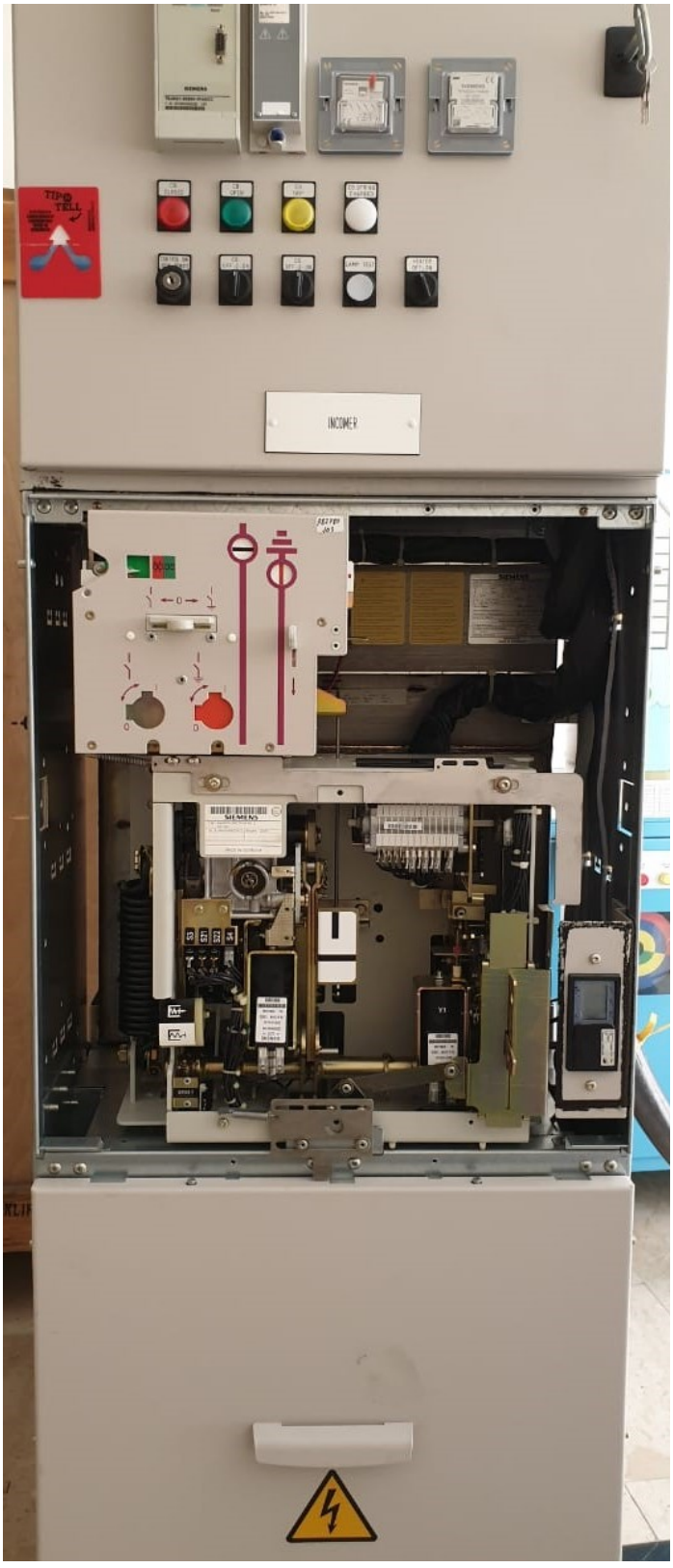
Troubleshooting Electrical Circuits V4.1 Simulator

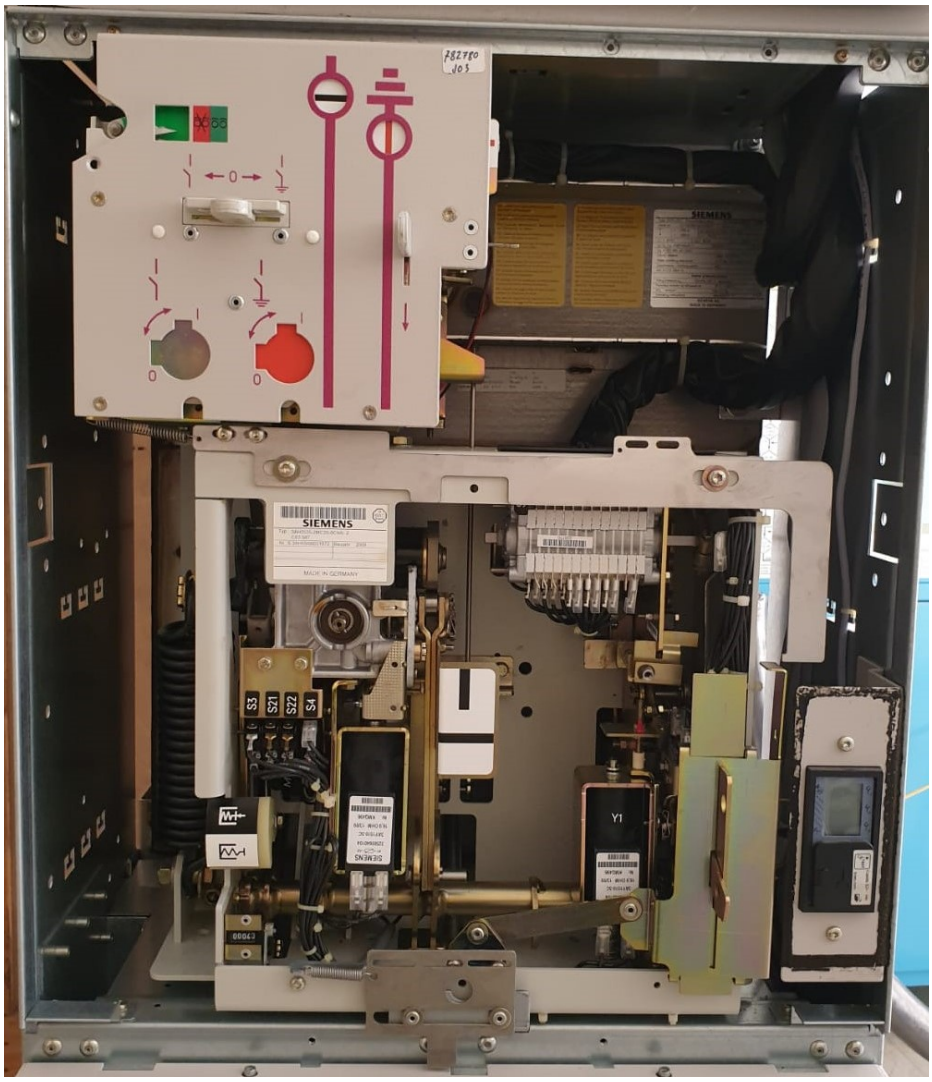


Haward Electric & Control Board


SIEMENS
AN:Kostenstelle 320/NXPLUSC
Auftrags:78-2780 Pos:20
Feld-Nr.:/Typical: JZ04/J03


FORKLIFT ONLY


INCOMER



Switchgear Simulator

Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org