COURSE OVERVIEW HE1845-4D
Design of Protection System

Course Title
Design of Protection System

Course Date/Venue
December 23-26,2024/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
HE1845-4D

Course Duration/Credits
Four days/2.4 CEUs/24 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.

This course is designed to provide participants with a detailed and up-to-date overview of Design of Protection System. It covers the importance of protection system in various industries; the different types of protection systems; the relevant codes, standards and regulation; the risk assessment for identification of potential hazards and hazard analysis techniques; the critical assets, processes and risk reduction targets; the layers of protection and safety integrity levels (SIL); the fire protection systems, fire dynamics and behavior and design principles for fire detection alarm systems; and the fire suppression systems and performance-based design approaches.

During this interactive course, participants will learn the electrical protection system, electrical hazards, risks, electrical faults protection and grounding and bonding systems; the safety instrumented systems (SIS), safety integrity levels (SIL), system architectures and safety devices; the emergency shutdown system (ESD), air pollution control systems and wastewater treatment system; the physical security systems design; the intrusion detection and alarm systems design; the analysis, failure modes evaluation, system performance and availability evaluation and redundancy and backup system design; the protection systems, functional testing and performance verification; and the maintenance strategies and procedures, documentation, record-keeping and continuous improvement.

Course Objectives

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

- Apply and gain an in-depth knowledge on design of protection system
- Discuss the importance of protection system in various industries
- Identify the different types of protection systems including the relevant codes, standards and regulations
- Conduct risk assessment for identification of potential hazards and hazard analysis techniques
- Determine the critical assets and processes, establish risk reduction targets and discuss the layers of protection and safety integrity levels (SIL)
- Recognize fire protection systems, fire dynamics and behavior and design principles for fire detection alarm systems
- Design fire suppression systems and apply performance-based design approaches
- Discuss the electrical protection system, electrical hazards, risks, electrical faults protection and grounding and bonding systems
- Interpret safety instrumented systems (SIS), safety integrity levels (SIL), system architectures and safety devices
- Design emergency shutdown system (ESD), air pollution control systems and wastewater treatment system
- Illustrate physical security systems design as well as intrusion detection and alarm systems design
- Apply reliability analysis, failure modes evaluation, system performance and availability evaluation and redundancy and backup system design
- Test and commission protection systems as well as carryout functional testing and performance verification
- Employ maintenance strategies and procedures, documentation, record-keeping and continuous improvement

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, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of design of protection system for electrical engineers, power systems engineers, protection engineers, control engineers, system operators, utility professionals, electrical technicians and power system consultants.

Course Certificate(s)
Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Course 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 **2.4 CEUs** (Continuing Education Units) or **24 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 Fee
US$ 4,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

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

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. Dimitry Rovas, CEng, MSc, PMI-PMP, is a **Senior HSE Consultant** with extensive industrial experience in **Oil**, **Gas**, **Power** and **Utilities** industries. His expertise include **Design of Protection System**, **Hazardous Materials** (**HAZMAT**), **Hazard Communication** (**HAZCOM**), **Hazard Recognition & Assessment**, **Task Risk Management & Managing Risk in Process Plant, Risk Assessment & Hazard Identification**, **Risk Control**, **Cryogens**, **MSDS**, Liquified Natural Gas, **Hazard Monitoring Techniques**, **Environmental Pollution Prevention**, **Hazardous Classification**, Packaging & Labelling, **Chemical Transportation**, **Waste Management**, **Chemical Spill Clean Up**, **Risk Assessments**, Safety & Emergency Plans, Working at Heights, Firefighting, Rescue & Operation, Fall Protection, **HSSE Emergency Response & Crisis Management Operations**, **Confined Space Entry**, **Construction Health & Safety**, HSSE Principles & Practices, **HSE Quantitative Risk Assessment** (**QRA**), **Root Cause Analysis** & **Techniques**, **Hazardous Materials & Chemicals Handling**, **Chemical Spills**, **Safety Precaution & Response Action Plan**, **PSM**, **PHA**, **HAZOP**, **HAZID**, **Hazard & Risk Assessment**, **Task Risk Assessment** (**TRA**), **Incident Command**, **Accident & Incident Investigation**, **Emergency Response Procedures**, Job Safety Analysis (**JSA**), Behavioural Based Safety (**BBS**), **Work Permit & First Aid**, **Emergency Response**, H_2S, ERP Preparation, Project HSE Management System, Health & **Hygiene** Inspection, PTW Control, Process Modules Fire & Gas Commissioning, **Ergonomics**, **Lockout/Tagout**, Fire Safety & Protection and **Spill Prevention & Control**. He is currently the **Project Manager** wherein he is managing, directing and controlling all activities and functions associated with the domestic heating/cooling facilities projects.

During his life career, Mr. Rovas has gained his practical and field experience through his various significant positions and dedication as the **EPC Project Manager**, **Field Engineer**, **Preventive Maintenance Engineer**, **Researcher**, **Instructor/Trainer**, **Telecom Consultant** and **Consultant** from various companies such as the Podaras Engineering Studies, Metka and Diadikasia, S.A., **Hellenic Petroleum Oil Refinery** and COSMOTE.

Mr. Rovas is a **Chartered Engineer** of the **Technical Chamber** of **Greece**. Further, he has **Master** degrees in **Mechanical Engineering** and **Energy Production & Management** from the **National Technical University of Athens**. Moreover, he is a **Certified Instructor/Trainer**, a **Certified Project Management Professional** (**PMP**) and a **Certified Six Sigma Black Belt**. He is an active member of Project Management Institute (**PMI**), Technical Chamber of Greece and Body of Certified Energy Auditors and has further delivered numerous trainings, seminars, courses, workshops and conferences internationally.

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 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: ***Monday, 23rd of December 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Protection Systems*** *Protection Systems & their Importance in Various Industries • The Role of Protection Systems in Safety & Asset Protection • Different Types of Protection System (Fire Protection, Electrical Protection, Process Safety, etc) • Relevant Codes, Standards & Regulation*
0930 – 0945	*Break*
0945 – 1030	***Risk Assessment & Hazard Analysis*** *Conducting Risk Assessment for Identification of Potential Hazards • Hazard Analysis Techniques (HAZID, HAZOP, FMEA, etc) •*
1030 – 1230	***Risk Assessment & Hazard Analysis (cont'd)*** *Determining the Critical of Assets & Processes • Establishing Risk Reduction Targets*
1230 – 1245	*Break*
1245 – 1420	***Risk Assessment & Hazard Analysis (cont'd)*** *Layers of Protection & Safety Integrity Levels (SIL)*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2: ***Tuesday, 24th of December 2024***

0730 – 0930	***Fire Protection Systems Design*** *Fire Protection Systems (Fire Detection, Suppression & Alarm) • Fire Dynamics & Behavior • Design Principles for Fire Detection & Alarm Systems*
0930 – 0945	*Break*
0945 – 1100	***Fire Protection Systems Design (cont'd)*** *Designing Fire Suppression Systems (Sprinkles, Water Mist, Gas Suppression, etc.) • Performance-Based Design Approaches*

1100 – 1230	***Electrical Protection Systems Design*** *Electrical Protection Systems • Electrical Hazards & Risks • Designing Electrical Protection Systems for Power Distribution*
1230 – 1245	*Break*
1245 – 1420	***Electrical Protection Systems Design (cont'd)*** *Protection Against Electrical Faults (Short Circuits, Overload, etc) • Design of Grounding & Bonding Systems*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3: ***Wednesday, 25th of December 2024***

0730 – 0930	***Process Safety Systems Design*** *Process Safety & Its Importance • Designing Safety Instrumented Systems (SIS) for Process Control • Determining Safety Integrity Levels (SIL) & System Architectures*
0930 – 0945	*Break*
0945 – 1100	***Process Safety Systems Design (cont'd)*** *Selection of Safety Devices (Sensors, Logic Solvers, Final Elements) • Documentation & Verification of SIS Design*
1100 – 1230	***Emergency Shutdown Systems (ESD) Design*** *The Need for Emergency Shutdown Systems • Designing ESD Systems for Process Control • Emergency Shutdown Devices & their Selection*
1230 – 1245	*Break*
1245 – 1420	***Emergency Shutdown System (ESD) Design (cont'd)*** *Design Considerations for Emergency Shutdowns Logics • Integration with Other Protection Systems*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

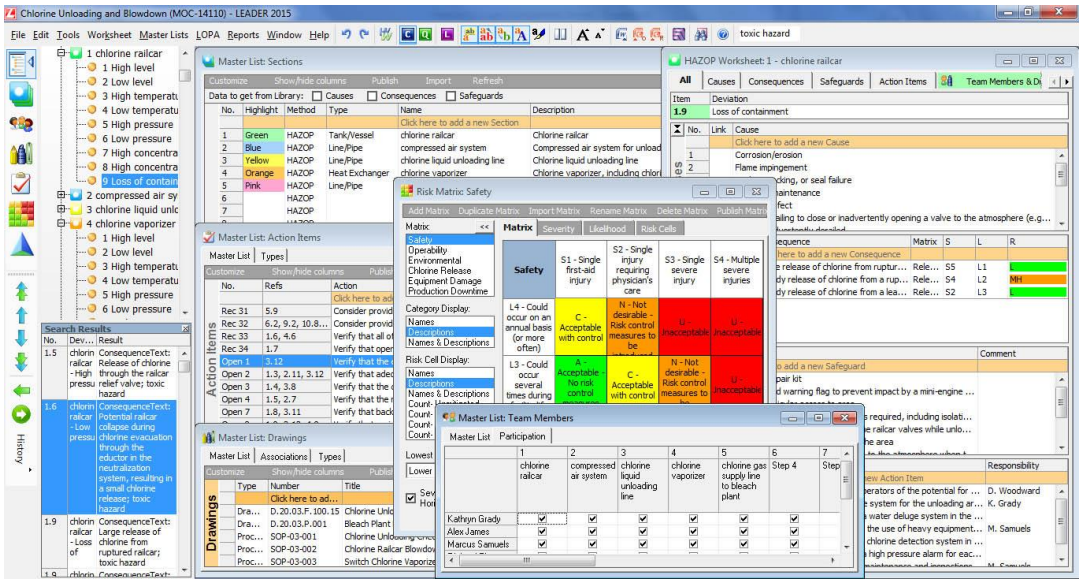
Day 4: ***Thursday, 26th of December 2024***

0730 – 0930	***Environmental Protection Systems Design*** *Environmental Protection Systems • Designing Systems for Air Pollution Control • Designing Systems of Wastewater Treatment • Spill Containment & Prevention Measures • Compliance with Environmental Regulations*
0930 – 0945	*Break*
0945 – 1100	***Physical Security Systems Design*** *Physical Security Systems • Designing Access Control Systems • Design Considerations for Video Surveillance & Monitoring • Intrusion Detection & Alarm Systems Design • Integration of Physical Security Systems*
1100 – 1230	***System Integration & Reliability Analysis*** *Integration of Various Protection Systems • Communication & Interlock Systems • Reliability Analysis & Failure Modes Evaluation • Evaluating System Performance & Availability • Redundancy & Backup Systems Design*
1230 – 1245	*Break*

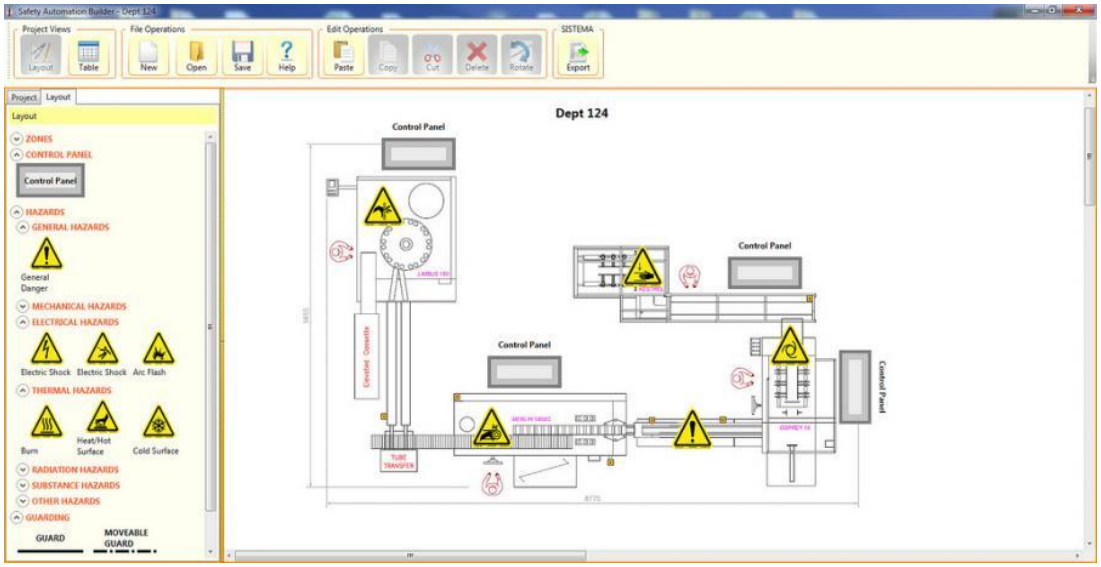
1245 – 1345	***Testing, Commissioning & Maintenance*** *Testing & Commissioning of Protection Systems • Functional Testing & Performance Verification • Maintenance Strategies & Procedures • Documentation & Record-Keeping Requirements • Evaluating System Effectiveness & Continuous Improvement*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

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 "Haward PHA/HAZOP" Simulator and Safety Automation Builder Software (Rockwell Automation)" Simulator.



Haward PHA/HAZOP Simulator



Safety Automation Builder (Rockwell Automation) Simulator

Course Coordinator

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