COURSE OVERVIEW IE0088
Tricon System Installation

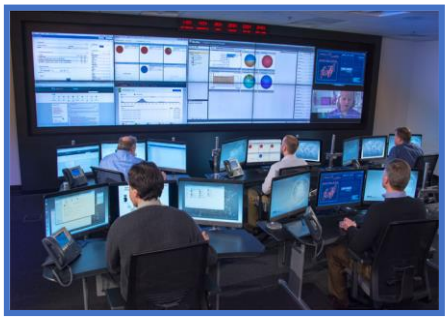
Course Title
Tricon System Installation

Course Date/Venue
September 09-13, 2024/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

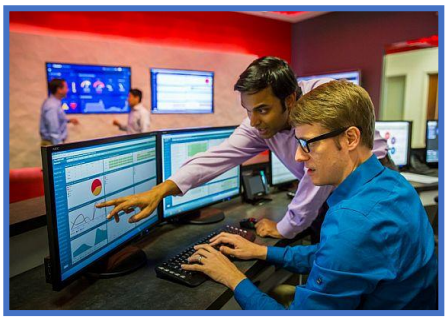
Course Reference
IE0088

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

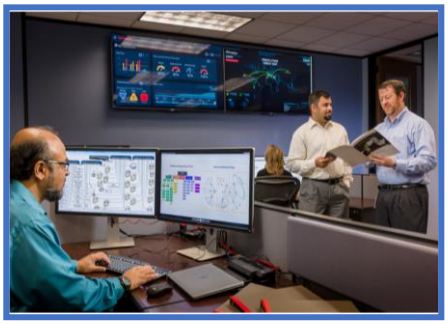
Course Description



This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.



This course is designed to provide participants with a detailed and up-to-date overview of Tricon System and TriStation 1131 configuration and implementation. It covers the principles of triconex and the operation of tricon's TMR architecture; the principles of tricon design and triple modular redundancy; the triconex tricon system and the attributes of tricon TMR system; the hardware basic components, I/O modules, field termination panels and communication modules; and configuring the controller and the tricon system components, power supply, main processors, input and output modules and terminations and communications modules.



During this interactive course, participants will learn the installing and wiring of a tricon system, connecting to a DCS and operating the tricon; enabling, disabling and forcing points; the maintenance of the tricon, detailed diagnostics and setting-up tristation communication; and replacing modules, maintenance procedures, collection of tricon events for maintenance and tristation diagnostic monitoring.

Course Objectives

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

- Apply and gain an in-depth knowledge on tricon system and tristation 1131 configuration and implementation
- Discuss the principles of triconex and the operation of tricon's TMR architecture
- Explain the principles of tricon design and triple modular redundancy
- Implement triconex tricon system and recognize the attributes of tricon TMR system
- Identify the hardware basic components, I/O modules, field termination panels and communication modules
- Configure the controller and recognize the tricon system components, power supply, main processors, input and output modules and terminations and communications modules
- Install and wire a tricon system, connect to a DCS and operate the tricon
- Illustrate enabling, disabling and forcing points as well as the maintenance of the tricon, detailed diagnostics and setting-up tristation communication
- Employ replacing modules, maintenance procedures, collection of tricon events for maintenance and tristation diagnostic monitoring

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 tricon system and tristation 1131 configuration and implementation for instrument project engineers, instrument and DCS maintenance engineers, DCS and ESD technical support engineers and instrument and DCS technicians.

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 who completed a minimum of 80% of the total tuition hours.

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 **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.

- 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$ 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.

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:

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 & Bachelor** degrees 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: Monday, 09th of September 2024

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction-Principles of Triconex***
0930 – 0945	*Break*
0945 – 1030	***The Basic Theory of Operation of the Tricon's TMR Architecture***
1030 – 1130	***Overview of Tristation***
1130 – 1215	***Principles of Tricon Design***
1215 – 1230	*Break*
1230 – 1330	***What is Tolerance?***
1330 – 1420	***How does Triple Modular Redundancy Work?***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: Tuesday, 10th of September 2024

0730 – 0830	***How are Faults Masked?***
0830 – 0930	***Triconex Tricon System Implementation***
0930 – 0945	*Break*
0945 – 1030	***Attributes of Tricon TMR System***
1030 – 1130	***Hardware Basic Components***
1130 – 1215	***I/O Modules***
1215 – 1230	*Break*
1230 – 1330	***Field Termination Panels***
1330 – 1420	***Communication Modules***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: Wednesday, 11th of September 2024

0730 – 0830	***Configure the Controller***
0830 – 0930	***Tricon System Components***
0930 – 0945	*Break*
0945 – 1030	***Power Supply Modules***
1030 – 1130	***Main Processors***
1130 – 1215	***Input & Output Modules***
1215 – 1230	*Break*
1230 – 1420	***Input & Output Terminations***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: Thursday, 12th of September 2024

0730 – 0830	***Installing the Tricon***
0830 – 0930	***Install & Wire a Tricon System***
0930 – 0945	*Break*

0945 – 1030	***Grounding Requirements***
1030 – 1130	***Connecting to a DCS***
1130 – 1215	***Operating the Tricon***
1215 – 1230	*Break*
1230 – 1330	***Overview of TriStation MSW***
1330 – 1420	***Enabling, Disabling & Forcing Points***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5: ***Thursday, 13th of September 2024***

0730 – 0815	***Maintenance of the Tricon***
0815 – 0900	***Detailed Diagnostics***
0900 – 0930	***Set-Up TriStation Communication***
0930 – 0945	*Break*
0945 – 1030	***Replacing Modules***
1030 – 1130	***Maintenance Procedures***
1130 – 1215	***Collection of Tricon Events for Maintenance***
1215 – 1230	*Break*
1230 – 1345	***Tristation Diagnostic Monitor***
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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