Haward Technology Middle East

COURSE OVERVIEW IE0424
Distribution Control System (DCS) Operations, Maintenance & Troubleshooting (Yokogawa CENTUM CS 3000)

Course Title
Distribution Control System (DCS) Operations, Maintenance and Troubleshooting (Yokogawa CENTUM CS 3000)

H-STK© INCLUDED

Course Date/Venue
Session 1: April 06-10, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: September 08-12, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

3.0 CEUs (30 PDHs) AWARD

Course Reference
IE0424

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.

The purpose of this course is to help participants obtain knowledge and understanding of Yokogawa Centum VP Distributed Control System. Participants' skills will be enhanced to such level that they develop thorough understanding of the hardware and software of the system components. They will possess enhanced skills in troubleshooting and engineering of the system.
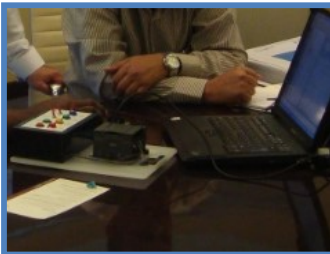
The course is designed to develop/improve the skills in the said system to those who are involved in the installation, testing, maintenance, configuration and troubleshooting of the said DCS. The course will also cover the best preventive maintenance practices on the field devices, control room hardware, and software during annual shutdowns, annual inspections and major inspections. The participants who attend this course must possess the knowledge and skills in identifying applicable and appropriate maintenance quality checks and assurance to measure effectiveness of the complete system.

The course will provide onsite classroom-type, instructor-led comprehensive training for maintenance personnel to be able to operate and maintain the Yokogawa Centum VP DCS, Yokogawa Fieldbus System and Yokogawa Prosafe RS-ESD System installed in STG5 & 6. This course will provide relevant fundamental knowledge as well as advanced knowledge through instructions, demonstrations, extended exercises and hands-on sessions using actual hardware and software simulators.

Course Objectives

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

- Install, test, maintain and troubleshoot Yokogawa Centum VP DCS

- Discuss process control system including controllers, functions, systems and its development history

- Identify Yokogawa CENTUM VP DCS covering DCS minimum system components, CS3000 R3 system, human interface station (HIS), field control station, network, system capacity and hardware configuration

- Recognize HIS startup, engineering environment and project creation

- Define FCS configuration and illustrate process input/outputs in creating a new node and IOM builder

- Describe control drawing builder, control drawing environment, tool bar, registering the function block and control drawing wiring

- Explain regulatory control function blocks including its types, detail specification and other regulatory control function

- Determine sequence control function, HIS function, scheduler and trend

- Configure HIS window and carryout maintenance considerations

- Interpret the fundamental knowledge of operation and functions of the CENTUM VP

- Perform generation of CENTUM VP regulatory control functions, sequence control function and Human Interface Station (HIS)

- Employ maintenance procedure, software installation, back-up procedures and maintenance tools of CENTUM VP hardware

- Discuss fieldbus concepts and install software and fieldbus engineering tool

- Describe the concepts of Plant Resource Manager (PRM) and perform generation of ProSafe-RS programs, hardware and software maintenance and CENTUM VP or CS3000 configuration

- Operate and maintain the STG 5&6 Yokogawa Centum VP DCS/Yokogawa related sub-systems and related network architecture

- Create and configure a new project

- Add new tags/instruments/devices to the system, modify existing configurations, add, modify, configure new graphic screens, and develop and edit screens

- Edit, add, modify and compile configuration files as well as deploy and download to controllers

- Perform logic simulations and modifications

- Develop a working knowledge on how to setup the system communications

- Use associated software maintenance tools effectively

- Perform system administration and security control functions, network administration and troubleshooting and hardware and software maintenance procedures on the systems

- Diagnose faults and replace modules in a professional manner

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 an overview of all significant aspects and considerations of Yokogawa Centum VP Distributed Control System for engineers and technicians involved in working with maintenance disciplines.

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 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 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: -

- **BAC** 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.

- **IACET** 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.

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. Barry Pretorius is a **Senior Electrical & Instrumentation Engineer** with almost **45** years of extensive experience within the **Oil**, **Gas**, **Petrochemical**, **Refinery** & **Power** industries. His expertise widely covers in the areas of Distributed Control System (**DCS**), **DCS** Operations & Techniques, **Plant Control** and Protection Systems, **Process Control & Instrumentation**, **Cascade Control Loops**, **Split-Range Control Loops**, **Capacity Control** & Other Advanced Control Schemes, **Safety Instrumented Systems**, **Plant Automation** Operations & Maintenance, Programmable Logic Controller (**PLC**), **Siemens PLC** Simatic S7-400/S7-300/S7-200, **PLC & SCADA** for Automation & Process Control, **Artificial Intelligence**, **Allen Bradley PLC** Programing and Hardware Trouble Shooting, Schneider **SCADA System**, **Wonder Ware**, **Emerson**, **Honeywell**, **Honeywell** Safety Manager PLC, **Yokogawa**, Advanced **DCS Yokogawa**, **Endress & Hauser**, Field Commissioning and Start up Testing Pre Operations, System Factory Acceptance Test (**FAT**), FactoryLink ECS, Modicon 484, Rockwell Automation, System Site Acceptance Test (**SAT**), **SCADA HMI & PLC** Control Logic, **Cyber Security** Practitioner, **Cyber Security** of Industrial Control System, **IT Cyber Security** Best Practices, **Cybersecurity** Fundamentals, **Ethical Hacking & Penetration Testing**, **Cybersecurity** Risk Management, **Cybersecurity** Threat Intelligence, **OT Whitelisting** for Better Industrial Control System Defense, **NESA** Standard and Compliance Workshop, **OT**, **Cyber Attacks** Awareness - Malware/Ransom Ware / Virus /Trojan/ Philsing, **Information Security Manager**, **Security System** Installation and Maintenance, Implementation, Systems Testing, Commissioning and Startup, **Foxboro DCS & Triconics**, **SIS** Systems, Advanced **DC Drives**, Motion Control, **Hydraulics**, **Pneumatics and Control Systems** Engineering, **Electrical & Automation Control Systems**, **HV/MV Switchgear**, **LV & MV** Switchgears & Circuit Breakers, **High Voltage Electrical Safety**, **LV & HV Electrical System**, **HV Equipment** Inspection & Maintenance, **LV Distribution Switchgear & Equipment**, **Electrical Safety**, **Electrical** Maintenance, **Transformers**, **Medium & High Voltage Equipment**, **Circuit Breakers**, **Cable & Overhead Line** Troubleshooting & Maintenance, **Electrical Drawing & Schematics**, **Voltage Distribution**, **Power Distribution**, **Filters**, **Automation System**, **Electrical Variable Speed Drives**, **Power** Systems, **Power Generation**, **Diesel Generators**, **Power Stations**, Uninterruptible Power Systems (**UPS**), **Battery Chargers**, **AC & DC Transmission**, **CCTV** Installation, **Data & Fire Alarm** System, **Evacuation** Systems and **Electrical Motors & Variable Speed Drives**, & Control of Electrical and Electronic devices.

During Mr. Pretorius's career life, he has gained his practical experience through several significant positions and dedication as the **Technical Director**, **Automation System's Software Manager**, **Site Manager**, **Senior Lead Technical Analyst**, **Project Team Leader**, **Automation Team Leader**, **Automation System's Senior Project Engineer**, **Senior Project & Commissioning Engineer**, **Senior Instrumentation & Control Engineer**, **Electrical Engineer**, **Project Engineer**, **Pre-Operations Startup Engineer**, **PLC Specialist**, **Radio Technician**, **A.T.E Technician** and **Senior Instructor/Trainer** from various companies like the ADNOC Sour Gas, Ras Al Khair Aluminum Smelter, Johnson Matthey Pty. Ltd, Craigcor Engineering, Unitronics South Africa Pty (Ltd), Bridgestone/Firestone South Africa Pty (Ltd) and South African Defense Force.

Mr. Pretorius's has a **Bachelor** of **Technology** in **Electrical Engineering** (**Heavy Current**). Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**), received numerous awards from various institutions and 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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	**PRE-TEST**
0830 – 0930	**Introduction to Process Control System** *Process Control by Controllers ● Process Control Functions ● Process Control Systems ● Development History of Control System*
0930 – 0945	*Break*
0945 – 1030	**Yokogawa Centum VP DCS System Overview** *DCS Minimum System Components ● System Components of CS3000 R3 System ● Human Interface Station (HIS) ● Field Control Station ● Network ● System Capacity ● Hardware Configuration*
1030 – 1115	**HIS Startup** *HIS Utility ● Virtual Test Function*
1115– 1200	**Engineering Environment** *Target System ● Non-target System ● Concurrent Engineering ● Engineering Flow*
1200 – 1215	*Break*
1215 – 1420	**Project Creation** *Types of Project ● Creating a Default Project ● Project Attribution Utility*
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

0730 – 0930	**Defining FCS Configuration** *FCS Properties ● FCS Station Definition ● Scan Transmission Definition*
0930 – 0945	*Break*
0945 – 1030	**Process Input/Outputs** *Creation of a New Node ● IOM Builder ● Laboratory Exercise G*
1030 – 1115	**Control Drawing Builder**
1115 – 1200	**Control Drawing** *Control Drawing Environment ● Tool Bar Definition ● Registering the Function Block ● Control Drawing Wiring*
1200 – 1215	*Break*
1215 – 1420	**Regulatory Control Function Blocks** *Functions of the Regulatory Control Blocks ● Types of the Regulatory Control Blocks ● Function Block Detail Specification of PID Block ● Other Regulatory Control Function Blocks*
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*

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Day 3

Time	Topic
0730 – 0930	**Sequence Control Function** Types of Sequence Control Blocks ● Sequence Table Configuration ● Logic Chart Block ● Software Input/Output
0930 – 0945	Break
0945 – 1030	**Defining HIS Function** HIS Property ● HIS Constants Builder
1030 – 1115	**Scheduler** Tasks Executable by Scheduler ● Execution of Tasks Defined on Scheduler ● Laboratory Exercise M
1115 – 1200	**Trend Definition** Flow of the Trend Recording ● Structure of Trend ● Defining Trend Block ● Trend Group Definition
1200 – 1215	Break
1215 – 1315	**HIS Window Configuration** Window Type ● Control Group Window Definition ● Overview Window Definition
1315 – 1420	**Maintenance Considerations**
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

Time	Topic
0730 – 0930	**Yokogawa Centum VP DCS System: Centum VP Fundamental Training for Engineering** Centum VP System Overview; Description of Hardware Used ● User Security, Basic Tag Features & Security, Standard Operation Panel ● Regulatory Control Functions & Sequential Control Functions ● System Status Displays, Process/Historical Reports
0930 – 0945	Break
0945 – 1030	**Yokogawa Centum VP DCS System: Centum VP for Engineering** Centum VP Specifications, Project Creation, Attribute Utilities & Project Common Definition ● FCS Configuration Procedures, I/O Module Configuration Procedures, Software Switches Configuration Procedures, Message Definition, Control Drawing Builder, Regulatory Control Function Definition ● Test Function, Sequence Control Definition Function ● HIS Configuration, Windows Configuration ● Graphics Builder
1030 – 1115	**Yokogawa Centum VP DCS System: Centum VP for Maintenance** Centum VP System Configuration, HIS Hardware & Software, Daily Checks ● System Maintenance Function ● FCS Hardware Configuration -& Daily Checks ● Troubleshooting
1115 – 1200	**Yokogawa Fieldbus System: Fieldbus Engineering** Overview Fieldbus Concepts, Fieldbus System Hardware & Fieldbus Communication ● Segment Design Considerations Fieldbus Devices ● Fieldbus Engineering Concepts, CENTUM Fieldbus Block Engineering ● Fieldbus Device Management Tool, NI Tool & Yokogawa Device Management Tool ● Fieldbus Startup Procedures, Fieldbus Device Replacement Procedure

1200 – 1215	Break
1215 – 1420	**Yokogawa Fieldbus System: Plant Resource Manager (PRM)** *Overview of Plant Resource Manager ● PRM System Configuration, PRM Function Specification ● PRM Installation & Operation Procedures ● Device Parameter Changes through PRM*
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 Four*

Day 5

0730 – 0930	**Yokogawa Prosafe-RS-ESD System: ProSafe-RS Engineering & Maintenance** *Introduction to Safety & Safety Integrity Levels "SIL", ProSafe-RS Hardware ● SCS Manager (Workbench) Software ● Project Creation, Design Function Blocks, Simulation & Debug, Project Downloading ● Creation of Application Logic, Application Development ● Instances & Typical, User-Defined Blocks- Creation of Function Blocks*
0930 – 0945	Break
0945 – 1030	**Yokogawa Prosafe-RS-ESD System: ProSafe-RS Engineering & Maintenance (cont'd)** *ProSafe-RS & CENTUM VP or CS3000 Integration, Inter-SCS Communication, CPU & I/O Module Replacement ● Version Control Tool Procedures, Database Validity Check Tool, Sequence of Events Recorder ● Security & Password Protection, SCS Reports*
1030 – 1115	**Practical Sessions** *The Hands-on Labs are Performed on Computers Where Special Software & Hardware is Installed to Emulate Exactly the Yokogawa Centum VP System Version & Functions Installed in STG 5&6 Adequate for the Number of Participants. The Equipment to be Used will be able to Provide the Same or Similar Interfaces as the HIS & EWS Used in STG 5&6*
1115 – 1200	**Practical Sessions (cont'd)** *The Hands-on Labs are Performed on Computers Where Special Software & Hardware is Installed to Emulate Exactly the Yokogawa Centum VP System Version & Functions Installed in STG 5&6 Adequate for the Number of Participants. The Equipment to be Used will be able to Provide the Same or Similar Interfaces as the HIS & EWS Used in STG 5&6 (cont'd)*
1200 – 1215	Break
1215 – 1345	**Practical Sessions (cont'd)** *The Hands-on Labs are Performed on Computers Where Special Software & Hardware is Installed to Emulate Exactly the Yokogawa Centum VP System Version & Functions Installed in STG 5&6 Adequate for the Number of Participants. The Equipment to be Used will be able to Provide the Same or Similar Interfaces as the HIS & EWS Used in STG 5&6 (cont'd)*
1345 – 1400	**Course Conclusion**
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 one of our state-of-the-art simulators "Allen Bradley SLC 500", "Siemens S7-200", "AB Micrologix 1000 (Digital or Analog)" and "HMI/SCADA.

Allen Bradley SLC 500 Simulator

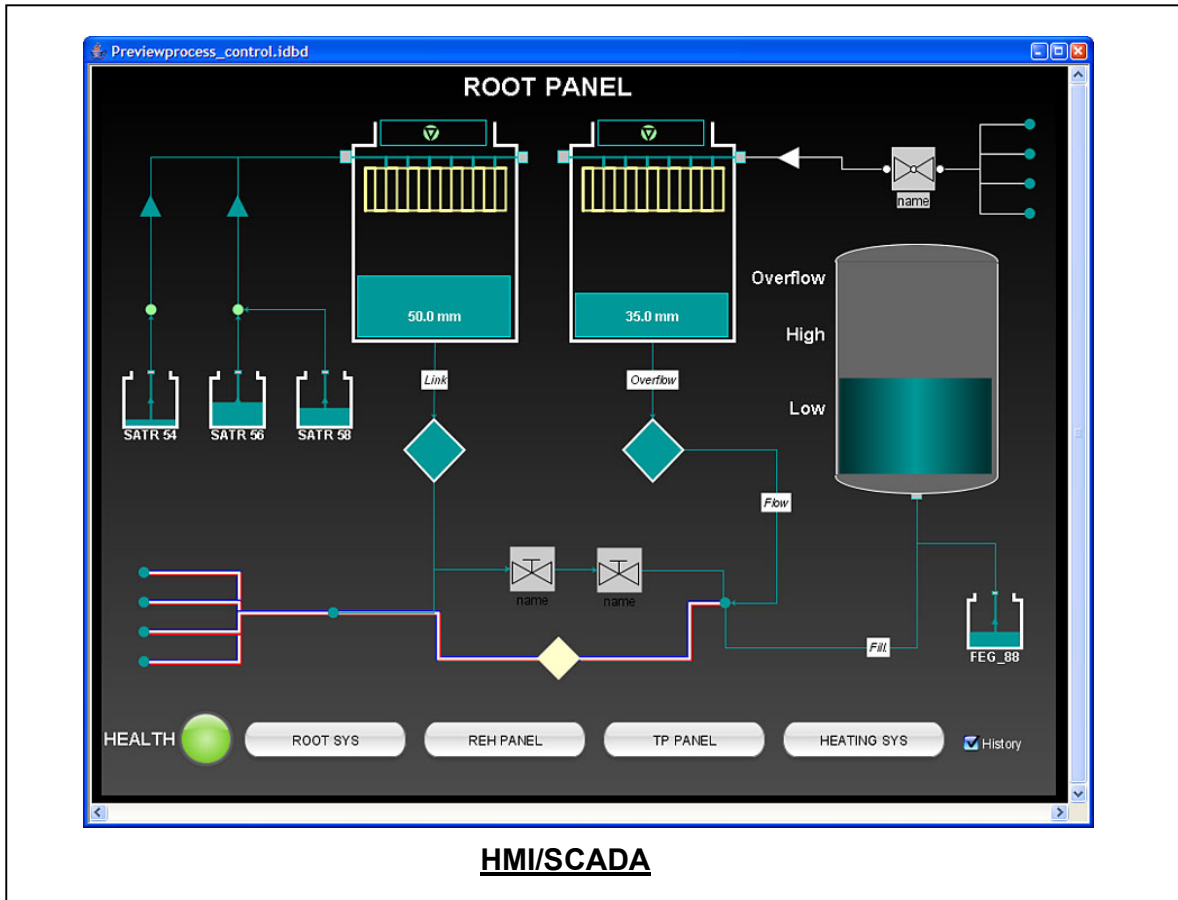**Siemens S7-200 Simulator**

Allen Bradley Micrologix 1000 Simulator (Digital)

Allen Bradley Micrologix 1000 Simulator (Analog)

HMI/SCADA

Course Coordinator
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