Haward Technology Middle East

COURSE OVERVIEW IE0917

CCC Series 5 Vanguard and Series 5M: Maintenance and Implementation

Course Title
CCC Series 5 Vanguard and Series 5M: Maintenance and Implementation

Course Reference
IE0917

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

Course Date/Venue

| Session(s)	Date	Venue
1	May 04-08, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
2	July 21-25, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
3	September 28-Ocotber 02, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	November 17-21, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

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 on CCC Series 5 Vanguard and Series 5M: Maintenance and Implementation. It covers the CCC control systems, system architecture and CCC vanguard and 5M platforms; the installation guidelines and best practices, I/O configuration and human machine interface (HMI) and navigation; the control configuration studio (CCS) and loop and function block design; the sensor and actuator calibration, system simulation and testing and alarms, events and diagnostic tools; and the pre-commissioning activities, controller initialization and downloads, tuning control loops and system integration with DCS/PLC.

During this interactive course, participants will learn to commission checklist execution and change management and configuration control; the routine maintenance requirements and hardware troubleshooting techniques; the software fault diagnostics, field device troubleshooting, system recovery and backup; the performance monitoring and reporting, advanced surge and performance control strategies; the integration with machine monitoring systems; the cybersecurity in CCC systems and loop creation and modification; running fault simulations and manual versus auto mode testing; and the interlock testing practice.
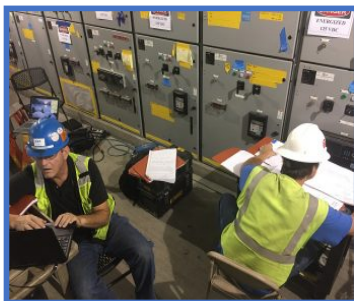
Course Objectives

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

- Apply and gain an in-depth knowledge on the maintenance and implementation of CCC series 5 vanguard and series 5M

- Discuss CCC control systems, system architecture and CCC vanguard and 5M platforms

- Carryout installation guidelines and best practices, I/O configuration and human machine interface (HMI) and navigation

- Recognize control configuration studio (CCS), create and manage projects and describe loop and function block design

- Employ sensor and actuator calibration, system simulation and testing and alarms, events and diagnostic tools

- Apply pre-commissioning activities, controller initialization and downloads, tuning control loops and system integration with DCS/PLC

- Commission checklist execution and apply change management and configuration control, routine maintenance requirements and hardware troubleshooting techniques

- Carryout software fault diagnostics, field device troubleshooting, system recovery and backup and performance monitoring and reporting

- Illustrate advanced surge and performance control strategies, integration with machine monitoring systems and cybersecurity in CCC systems

- Apply loop creation and modification, running fault simulations, manual versus auto mode testing and interlock testing practice

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 CCC series 5 vanguard and series 5M: maintenance and implementation for engineers involved in system updates or tuning, control system engineers, instrumentation engineers, automation engineers, commissioning engineers, maintenance engineers, project engineers, DCS/PLC integrators, field technicians, plant operators, control room personnel and other technical staff.

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.

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.

    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.

- 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.

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:

Mr. Barry Pretorius is a **Senior Electrical & Instrumentation Engineer** with almost **30** 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**, **Liquid & Gas Flowmetering**, **Custody Measurement**, **Ultrasonic Flowmetering**, **Loss Control**, **Loss Control** & **Multiphase Flowmetering**, **Custody Measurement** & **Loss Control**, **Gas Measurement**, **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, **Fire & Gas Detection** System, 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.

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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	**PRE-TEST**
0830 – 0930	***Overview of CCC Control Systems*** *Evolution from Series 3 to Series 5 and 5M • Applications in Turbomachinery • Core Differences Between Vanguard and 5M • Role in Surge and Performance Control*
0930 - 0945	*Break*
0945 – 1045	***System Architecture*** *Controller Hardware and Modules • Communication Architecture (CANBus, Ethernet) • Expansion Modules and Scalability • System Power Requirements and Redundancy*
1045 - 1145	***Basics of CCC Vanguard & 5M Platforms*** *User Interfaces and Panel Layout • Basic Navigation and Diagnostics • Control Loops Handled by Each Platform • Software vs Hardware-Based Functions*
1145 - 1230	***Installation Guidelines & Best Practices*** *Pre-Installation Checks • Environmental Conditions and EMC Requirements • Wiring and Grounding Practices • Mounting and Cabinet Layout*
1230 – 1245	*Break*
1245 – 1330	***I/O Configuration & Types*** *Digital and Analog I/O Structure • Thermocouples and RTD Input Setup • Actuator Control Outputs • Pulse Input and Frequency-Based I/O*
1330 - 1420	***Human Machine Interface (HMI) & Navigation*** *HMI Display Configuration • Diagnostic Views and Alarm Handling • Trending and Data Logging Screens • Secure Access Levels and Passwords*
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 – 0830	**Control Configuration Studio (CCS)** *Software Installation and Activation • Navigating the CCS Interface • Import/Export of Configuration Files • Compatibility with Vanguard and 5M*
0830 – 0930	**Creating & Managing Projects** *Defining a New Project • Device Tree and Tag Management • Project File Organization • Version Control and Backups*
0930 - 0945	*Break*
0945 – 1130	**Loop & Function Block Design** *Basic Loop Templates • Adding and Connecting Function Blocks • Surge and Performance Control Strategies • Troubleshooting Logic Block Errors*
1130 - 1230	**Sensor & Actuator Calibration** *Setting Up Analog Inputs for Pressure/Temp • Configuring Actuator Travel Limits • Calibration Procedures • Diagnostic Tools for Sensors*
1230 - 1245	*Break*
1245 - 1330	**System Simulation & Testing** *Offline Simulation in CCS • Virtual Commissioning • Testing Interlocks and Alarms • Generating Test Reports*
1330 - 1420	**Alarms, Events, & Diagnostic Tools** *Alarm Priorities and Categorization • Event History Viewer • Fault Logging and Troubleshooting • Exporting and Archiving Alarm Logs*
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

0730 – 0830	**Pre-Commissioning Activities** *Site Acceptance Checklist • Verifying Field Wiring and Terminations • Power-Up Sequence • Hardware Diagnostics and Health Check*
0830 – 0930	**Controller Initialization & Downloads** *Downloading Configurations to Hardware • Memory Allocation and Space Checking • Reboot Procedures and Validation • Verifying Communication Links*
0930 - 0945	*Break*
0945 – 1130	**Tuning Control Loops** *PID Tuning Procedures • Loop Response Analysis • Tuning Surge and Load-Sharing Loops • Adaptive versus Fixed Tuning*
1130 - 1230	**System Integration with DCS/PLC** *MODBUS, OPC, and Other Protocol Support • Ethernet/IP and Serial Integration • Handshake Logic for Command Exchange • Interface Configuration Steps*
1230 - 1245	*Break*
1245 - 1330	**Commissioning Checklist Execution** *Step-by-Step Commissioning Guide • Load Testing and Safety Validation • Troubleshooting Startup Problems • Reporting and Documentation*

1330 - 1420	**Change Management & Configuration Control** *Revision Tracking • Update Procedures • Secure Backups • Change Log Documentation*
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

0730 – 0830	**Routine Maintenance Requirements** *Daily, Weekly, and Monthly Checks • Dust, Vibration, and Temperature Control • Visual Inspection Protocols • Battery and Power Supply Checks*
0830 – 0930	**Hardware Troubleshooting Techniques** *Diagnosing Module Faults • LED Indicators and Error Codes • Replacing Modules Without Downtime • Dealing with Power Supply Failures*
0930 - 0945	*Break*
0945 – 1130	**Software Fault Diagnostics** *Monitoring Real-Time Values • Alarm Trends and Root Cause Analysis • Configuration Mismatch Detection • Simulator-Based Testing*
1130 - 1230	**Field Device Troubleshooting** *Verifying Sensor Accuracy • Actuator Movement and Position Feedback • Signal Integrity and Noise Issues • Replacement and Re-Calibration Steps*
1230 - 1245	*Break*
1245 - 1330	**System Recovery & Backup** *Creating and Restoring Backups • Factory Reset and Image Recovery • Flash Upgrade Procedures • Secure File Handling Protocols*
1330 - 1420	**Performance Monitoring & Reporting** *Creating System Health Reports • Tracking KPIs and Reliability Metrics • Using Built-In Analytics Tools • Predictive Maintenance Planning*
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	**Advanced Surge & Performance Control Strategies** *Multi-Valve Control Schemes • Load Sharing and Tie-In Logic • Setpoint Optimization Techniques • Real-World Tuning Examples*
0930 - 0945	*Break*
0945 - 1030	**Integration with Machine Monitoring Systems** *Integration with Vibration and Condition Monitoring • Data Exchange Using OPC UA • Interfacing with Bently Nevada and Similar • Centralized Diagnostics*
1030 – 1130	**Cybersecurity in CCC Systems** *Access Level Configuration • Password Policies • Ethernet Port Protection • Data Integrity Validation*

1130 - 1230	***Hands-On with Simulation & Test Panel*** *Loop Creation and Modification • Running Fault Simulations • Manual vs Auto Mode Testing • Interlock Testing Practice*
1230 - 1245	*Break*
1245 - 1345	***Troubleshooting Scenarios (Case Studies)*** *Vibration-Induced Trip Event • Surge Cycle Analysis • Actuator Position Error • Communication Failure Diagnosis*
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 one of our state-of-the-art simulators "Allen Bradley SLC 500", "AB Micrologix 1000 (Digital or Analog)", "AB SLC5/03", "AB WS5610 PLC", "Siemens S7-1200", Siemens S7-400" "Siemens SIMATIC S7-300", "Siemens S7-200" "GE Fanuc Series 90-30 PLC", "Siemens SIMATIC Step 7 Professional Software", "HMI SCADA", "RSLogix 5000", "Logix5555", "Schneider Electric Magelis HMISTU" and "Automation Simulator".

Allen Bradley SLC 500 Simulator

Allen Bradley Micrologix 1000 Simulator (Digital)

Allen Bradley Micrologix 1000 Simulator (Analog)

Allen Bradley SLC 5/03

Allen Bradley WS5610 PLC Simulator PLC5

Siemens S7-1200 Simulator

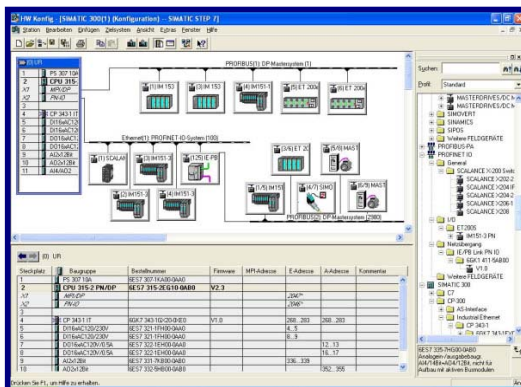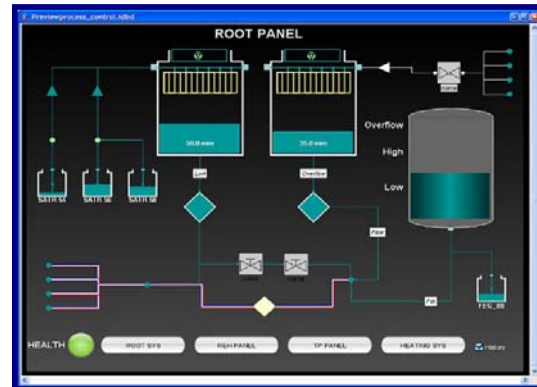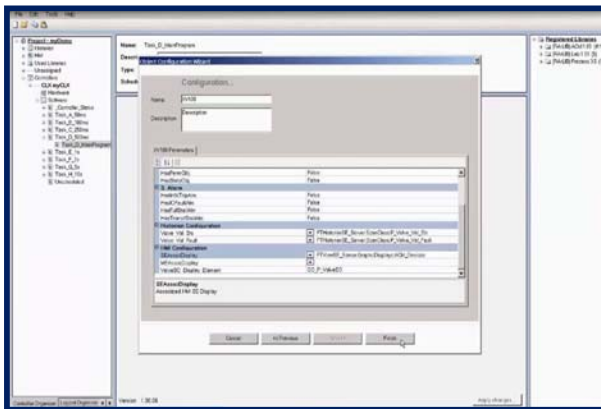**Siemens S7-400 Simulator**

Siemens SIMATIC S7-300

Siemens S7-200 Simulator

GE Fanuc Series 90-30 PLC Simulator

Siemens SIMATIC Step 7 Professional Software

HMI SCADA
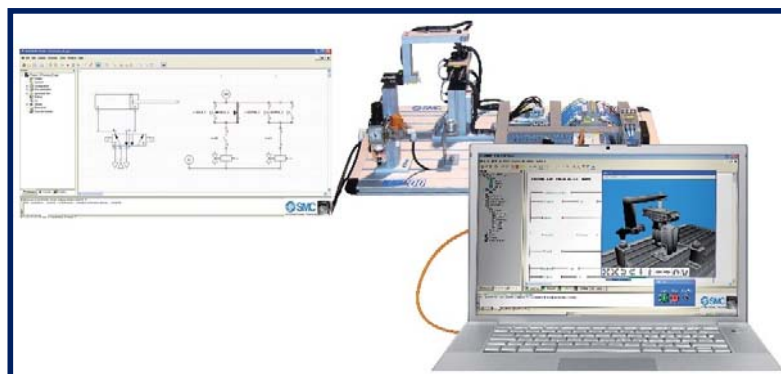
RSLogix 5000

Logix5555

Schneider Electric Magelis HMISTU

AutoSIM – 200 Automation Simulator

Course Coordinator
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