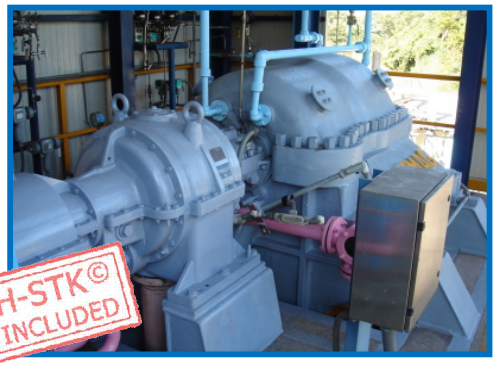
COURSE OVERVIEW IE0553
CCC Control Series 4: Maintenance and Implementation

Course Title
CCC Control Series 4 : Maintenance and Implementation



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

Course Reference
IE0553

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 CCC control series 4. It covers the logic controller and logic controller functions including start-up, shutdown sequencing, system monitoring, failure annunciation; the advanced ladder logic editing and the I/O types, high I/O channel counts, analog and digital inputs and outputs; the input fault detection and the operator interface module (OIM), decoupling of control loops, load-sharing algorithm and adverse control loop interactions; the application function module (AFM) S4 performance controller and the limiting control on critical pressures, temperatures and speeds; controlling single-input performance variable; the automatic sequencing of compressor start-up and shutdown, and the bump less transfers between automatic and manual control modes; the application function module (AFM) S4 fuel controller for gas turbines; and the automate turbine start-ups and shutdowns.

During this interactive course, participants will learn the speed and accelerating limiting, exhaust gas temperature (EGT) and compressor discharge pressure limiting; the generator control for synchronous generators, isochronous, megawatt droop or valve-position droop control and position control for fuel control and geometry-control devices; the application function module (AFM) S4 autosync controller, voltage, frequency, phase matching and generator protection and accurate synchronization strategy; and the modbus serial communication and distributed control system (DCS).

Course Objectives

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

- Apply systematic techniques on CCC-S4 control system
- Discuss S4 logic controller and logic controller functions covering start-up, shutdown sequencing, system monitoring, failure annunciation, etc
- Employ the advanced ladder logic editing and enumerate the I/O types like the high I/O channel counts, analog and digital inputs and outputs, etc
- Explain the input fault detection to monitor and annunciate transmitter failures, operator interface module (OIM), decoupling of control loops, load-sharing algorithm and adverse control loop interactions
- Discuss the application function module (AFM) S4 performance controller and identify the limiting control on critical pressures, temperatures and speeds
- Apply the controlling single-input performance variable, automatic sequencing of compressor start-up and shutdown, as well as bump less transfers between automatic and manual control modes
- Explain the application function module (AFM) S4 fuel controller for gas turbines and apply the automate turbine start-ups and shutdowns
- Employ the speed and accelerating limiting and analyze exhaust gas temperature (EGT) and compressor discharge pressure limiting
- Identify the generator control for synchronous generators and perform isochronous, megawatt droop or valve-position droop control and position control for fuel control and geometry-control devices
- Discuss application function module (AFM) S4 autosync controller, voltage, frequency, phase matching and generator protection and apply accurate synchronization strategy
- Explain modbus serial communication link to a host computer and distributed control system (DCS)

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 S4 control system for instrument, control, electrical, mechanical, process, operations and rotating equipment engineers & supervisors.

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.

- 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 **2.6 CEUs** (Continuing Education Units) or **26 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:

Dr. Ahmed El-Sayed, PhD, MSc, BSc, is a **Senior Instrumentation & Control Engineer** with over **30 years** of extensive experience in the **Oil**, **Gas**, **Power**, **Petroleum**, **Petrochemical** and **Utilities**. He specializes in **DCS & ESD** System Architecture, **Distributed Control System**, **DCS** & **SCADA**, Distributed Control System (**DCS**) Selection & Troubleshooting, **DCS**, **Process Control**, **Control Systems & Data Communications**, Advanced **DCS Yokogawa**, **Yokogawa CENTUM VP DCS**, **Modern Distributed Control System** (**DCS**) **& Process Instrumentation**, **Cyber Security** of Industrial System, **DCS System** (**Honeywell**), **DCS Experion** System, **DCS Siemens Telepherm XP**, **Measurement Devices & Control System**, **Instrumentation & Control** Systems, **Control System** Orientation, **Instrumentation Protection Devices** Maintenance & Testing, **Protection Devices** Troubleshooting, **Relay Coordination Using ETAP Software**, **Power System Study on ETAP**, **ETAP-Power System Analysis**, **Flow Measurement** Foundation, **Hydrocarbon** Measurement & Sampling, **Gas Dosiers** Preparation, **Gas/Liquid Fuel** Measurement, **Instrumentation Measurement & Control System**, **Flow** Measurement, **Pressure** Measurement, **Level & Temperature** Measurement, Uninterruptible Power Supply (**UPS**) **Battery Charger**, **Protective Systems**, **Electrical Generators**, **Power** & **Distribution Transformers**, **Electrical Motors**, **Switchgears**, **Transformers**, **AC** & **DC Drives**, **Variable Speed Drives** & **Generators**, **Generator Protection**, **GE Gas Turbines**, PLC, SCADA, Instrumentation, Automation, Valve Tuning, SIS, SIL, ESD, Alarm Management Systems, Engine Management System, Bearing & Rotating Machine, Fieldbus Systems and Fiber Optics Technology. 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, 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 as the **Instrumentation & Electrical Service Project Manager**, **Instrumentation & Control Engineer**, **Energy Management Engineer**, **Department Head**, **Assistant Professor**, **Instrumentation & Control Instructor**, **Project Coordinator**, **Project Assistant and Managing Board Member** 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 **ETAP**, 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 Engineering** from the **University of Wisconsin Madison**, **USA** and **Ain Shams University**, respectively. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/ Assessor/Trainer** by the **Institute of Leadership and Management** (**ILM**), an active member of IEEE and ISA as well as numerous technical and scientific 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.

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 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	***S4 Logic Controller***
0930 – 0945	*Break*
0945 – 1100	***Logic Controller Functions*** *Start-Up and Shutdown Sequencing ● System Monitoring*
1100 – 1230	***Logic Controller Functions (cont'd)*** *Failure Annunciation ● Trip Testing ● Integration with Other Application*
1230 – 1245	*Break*
1245 – 1420	***Advanced Ladder Logic Editing***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 - 0830	***I/O Types*** *High I/O Channel Counts ● Analog and Digital Inputs and Outputs ● LVDT Inputs ● Frequency Inputs*
0830 – 0930	***Input Fault Detection to Monitor & Annunciate Transmitter Failures***
0930 – 0945	*Break*
0945 – 1100	***Operator Interface Module (OIM)***
1100 – 1230	***Decoupling of Control Loops***

1230 – 1245	*Break*
1245 – 1345	***Load-Sharing Algorithm***
1345 – 1420	***Adverse Control Loop Interactions***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 - 0830	***Application Function Module (AFM) S4 Performance Controller***
0830 – 0930	***Limiting Control on Critical Pressures, Temperatures & Speeds***
0930 – 0945	*Break*
0945 – 1100	***Controlling Single-Input Performance Variable***
1100 – 1230	***Automatic Sequencing of Compressor Start-Up & Shutdown***
1230 – 1245	*Break*
1245 – 1345	***Bump Less Transfers between Automatic & Manual Control Modes***
1345 – 1420	***Application Function Module (AFM) S4 Fuel Controller for Gas Turbines***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 - 0830	***Automated Turbine Start-Ups & Shutdowns***
0830 – 0930	***Speed & Acceleration Limiting***
0930 – 0945	*Break*
0945 – 1100	***Exhaust Gas Temperature (EGT) Value from as Many as 16 Analog Inputs***
1100 – 1230	***Exhaust Gas Temperature Limiting***
1230 – 1245	*Break*
1245 – 1330	***Compressor Discharge Pressure Limiting***
1330 – 1400	***Generator Control for Synchronous Generators. Performs Isochronous, Megawatt Droop or Valve-Position Droop Control***
1400 - 1420	***Position Control for Fuel Control Valves & Geometry-Control Devices***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 - 0830	***Application Function Module (AFM) S4 Autosync Controller***
0830 – 0930	***More Accurately Synchronization Strategy***
0930 – 0945	*Break*
0945 – 1100	***Voltage, Frequency & Phase Matching***
1100 – 1230	***Generator Protection***
1230 – 1245	*Break*
1245 – 1345	***Modbus Serial Communication Link to a Host Computer or Distributed Control System (DCS)***
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 the following real-life case studies:-

Course Coordinator

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