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IE223:
CCC 5 Maintenance and Implementation

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Training Description:

This intensive training course covers the compressor characteristic combination of maximum head and minimum flow; the series 3 plus anti surge controller; the tailored control response; the surge or overload conditions; the measurable variables; the pressure drop across a flow meter and gas composition etc; the energy-wasting margin of safety; the proportional-integral control for preventing reset windup; the performance and antisurge controllers tuning; the surge calculations; and the open and closed-loop control responses.

During this inter active course, participants will learn the limiting control, surge protection, automatic start-up and shut-down logic; the transfer between manual and automatic operating modes; the operator error protection; the modbus interface; the CCC antisurge series 5; the application function module (AFM) S5; the CCC Vanguard 5 functions such as start-up and shutdown sequencing, system monitoring, failure annunciation, etc; the advanced ladder logic editing; the I/O types such as high I/O channel counts; the analog and digital inputs and outputs and LVDT inputs; the real-time multitasking and conditioning modules as well as RTD and thermocouple inputs; the operator interface module (OIM) and application software; the speed and acceleration limit; and the compressor discharge pressure limit.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Apply and gain a good working knowledge on CCC 5 Maintenance and Implementation
- ✓ Discuss the CCC – antisurge series 3+ and enumerate the compressor characteristic combination of maximum head and minimum flow
- ✓ Identify the series 3 plus anti surge controller, determine how close the compressor is to surging and analyze the surge prediction and tailored control response
- ✓ Evaluate the surge or overload conditions, measurable variables such as compression ratio, pressure drop across a flow meter, gas composition, etc
- ✓ Employ the energy-wasting margin of safety, proportional-integral control for preventing reset windup and discuss the performance and antisurge controllers tuning
- ✓ Explain the surge calculations automatically adapt to changing inlet conditions and to open and closed-loop control responses
- ✓ Apply destabilizing presentation, limiting control, surge protection, automatic startup and shut-down logic and discuss the transfer between manual and automatic operating modes
- ✓ Distinguish the operator error protection, modbus interface and explain the CCC antisurge series 5
- ✓ Discuss the application function module (AFM) S5 and CCC Vanguard 5 functions such as start-up and shutdown sequencing, system monitoring, failure annunciation, etc
- ✓ Apply the advanced ladder logic editing, I/O types such as high I/O channel counts, analog and digital inputs and outputs and LVDT inputs
- ✓ Employ real-time multitasking and discuss conditioning modules as well as RTD and thermocouple inputs, operator interface module (OIM) and application software
- ✓ Implement speed and acceleration limiting and compressor discharge pressure limiting

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Training Designed for:

This course is intended for instrument, control, electrical, mechanical, process, operations and rotating equipment engineers & supervisors.

Training Program:

DAY ONE:

- Pre-Test
- Introduction
- CCC - Antisurge Series 3+
- Compressor Characteristic Combination of Maximum Head and Minimum Flow
- Series 3 Plus Antisurge Controller
- Determination How Close the Compressor is to Surging
- Surge Prediction and Tailored Control Response
- Surge or Overload Conditions
- Measurable Variable
  - Compression Ratio
  - Pressure Drop Across A Flow Meter
  - Gas Composition
  - Suction Temperature and Pressure
  - Rotational Speed and Guide Vane Angle
- Energy-Wasting Margin of Safety
- Recap

DAY TWO:

- Proportional-Integral Control for Preventing Reset Windup
- Performance and Antisurge Controllers Tuning
- Surge Calculations Automatically Adapt to Changing Inlet Conditions
- Open and Closed-Loop Control Responses
- Destabilizing Preventation
- Limiting Control and Surge Protection
- Recap

DAY THREE:

- Automatic Start-Up and Shut-Down Logic
- Transfer Between Manual and Automatic Operating Modes
- Operator Error Protection
- Modbus Interface
- Recap

DAY FOUR:

- CCC - Antisurge Series 5
- Application Function Module (AFM) S5
- CCC - Vanguard-5 Functions
  - Start-Up and Shutdown Sequencing

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- System Monitoring
- Failure Annunciation
- Trip Testing
- Integration with other Application

❖ Advanced Ladder Logic Editing
❖ I/O Types
- High I/O Channel Counts
- Analog and Digital Inputs and Outputs
- LVDT Inputs

❖ Real-Time Multitasking
❖ Conditioning Modules (RTD and Thermocouple Inputs)
❖ Recap

DAY FIVE:

❖ Operator Interface Module (OIM)
❖ Speed and Acceleration Limiting
❖ Compressor Discharge Pressure Limiting
❖ Course Conclusion
❖ Post-Test and Evaluation

Training Requirement:

"Hand's on practical sessions, equipment and software will be applied during the course if required and as per the client's request".

Please note that the above topics can be amended as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

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Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

For training registrations or in-house enquiries, please contact:

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Training & Career Development Department