Operation & Maintenance Courses
On-Site Training

Control System Training for Operation

Learning Objectives: Upon completion of the course the participant will be able to:
- Identify a variety of compressors
- Explain surge phenomena and consequences on compressor operation and process stability
- Understand controllers operation
- Alarm resolution

Course Topics:
- Compressor Systems and Classifications
- Surge Phenomenon
  - Theory of surge control
  - System resistance
  - Causes
- Specialized Controller Features
  - Antisurge control
  - Performance control (if applicable)
  - Speed control (if applicable)
  - Extraction control (if applicable)
- Hands-on Simulation
  - Using simulation software, a laptop computer, and a demonstration unit consisting of actual CCC controllers
- Simulation Software
  - Compressor maps
  - Process disturbances
  - Instrument failures

Control System Training for Maintenance

Learning Objectives: Upon completion of the course the participant will be able to:
- Edit and build project
- Use configurator to set parameters and troubleshoot
- Analyze, identify and resolve alarms
- Safely replace hardware (on-line, off-line)
- Retrieve and send Train View data to CCC for analysis
Operation & Maintenance Courses
On-Site Training

Control System Training for Maintenance (continued)

Course Topics:

- **Antisurge Control**
  - Surge phenomenon
  - Compressor maps
  - Fallback strategies
  - Application alarms

- **Performance Control**
  - Flow or pressure control
  - Limiting control
  - Decoupling of antisurge and performance control loops
  - Automatic startup/shutdown
  - Performance override control (POC)
  - Tracking
  - Fallback strategies

- **Speed Control (if applicable)**
  - Steam turbine classifications
  - Speed measurement
  - MPU classifications
  - Automatic start up/shut down sequencing
  - Idle speeds
  - Critical speed avoidance
  - Overspeed functions

- **Hardware System Overview**
  - System components
  - Software architecture

- **Engineering Keyboard (S3+/S3++ only)**
  - Parameter grouping
  - Parameter modification
  - Keystroke sequences

- **Transmitter Failures & Troubleshooting**
  - Procedures to diagnose and correct problems
  - Card/Controller replacement
  - Communications
  - PI parameters

- **Site Specific Discussion**
  - P&I diagrams
  - Instrument connections
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On-Site Training

Control System Training for Maintenance (continued)

Course Topics:
- CCC Software Programs: Maintenance Tools Demonstration (if applicable)
  - Engineering utilities
    - Configurator
    - Fast recorder
    - Alarm monitor
  - Project Builder
    - Building a sample project
    - Project editing
    - Modbus list
  - Train View
    - Architecture of TV
    - Recorder and archiving
    - Maps and variables associated with displays
    - Alarms resolution
- Hands-on Simulation
  - Using simulation software and CCC controllers
    - Antisurge
    - Performance
    - Speed (if applicable)
    - Gas turbine (if applicable)

Course Requirements
The following are the requirements for CCC’s customized, on-site training:

- Appropriate training room
  - Screen
  - LCD Projector
  - White board with markers and eraser

Course Pricing
- Pricing assumes all classes are taught in consecutive 8-hour days
- Maximum number of participants for each course is 15
- Training quotation provided upon request, please email training@cccglobal.com